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Details of research papers published

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In the year 2023-2024, the faculty of The Oxford College of Engineering has published papers in various International Journals. There are total 155 International publications.

Sl. No	Academic Year	No. of Publication	
		National	International
1	2023-2024	0	155

Scopus	SCI	Web of Science	Google Scholar	UGC	Total
89	24	2	37	3	155

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Sl.No	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to website of the journal	Link to article/paper/abstract of the article	Is it listed in UGC Care list/Scopus/ Web of Science/other, mention
1	IoT based Innovative Teaching Learning using Smart Class Rooms	Raghu Ramamoorthy	CSE	IEEE Xplore	2023	978-1-6654-9199-0	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10104589	Scopus
2	Classification of COVID-19 with Belief Functions and Deep Neural Network	Raghu Ramamoorthy	CSE	SN Computer Science (Springer)	2023	2661-8907	https://link.springer.com/journal/42979	https://link.springer.com/article/10.1007/s42979-022-01593-0	Scopus
3	Reliable and Accurate Plant Leaf Disease Detection with Treatment Suggestions Using Enhanced Deep	Raghu Ramamoorthy	CSE	SN Computer Science (Springer)	2023	2661-8907	https://link.springer.com/journal/42979	https://link.springer.com/article/10.1007/s42979-022-01589-w	Scopus

	Learning Techniques								
4	An Empirical Study on E-Commerce Site using Unique AI based Features and Data Science Tools	J Jesy Janet Kumari, Sathya M, Ramya Sri M	CSE	IEEE Xplore	2023	979-8-3503-0010-9	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10193110/	Google Schoalr
5	An Empirical Study on E-Commerce Site using Unique AI based Features and Data Science Tools	Sathya M	CSE	IEEE Xplore	2023	979-8-3503-0010-9	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10193110/	Google Schoalr
6	An Empirical Study on E-Commerce Site using Unique AI based Features and Data Science Tools	Ramya Sri M	CSE	IEEE Xplore	2023	979-8-3503-0010-9	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10193110/	Google Schoalr
7	Prediction of Infant Growth using the	Vinotha D	CSE	IEEE Xplore	2023	979-8-3503-9927-1	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10182723	Google Schoalr

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	Random Forest Algorithm								
8	IoT based Innovative Teaching Learning using Smart Class Rooms	Dr. E. Saravana Kumar	CSE	IEEE Xplore	2023	978-1-6654-9199-0	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10104589	Google Schoalr
9	Classification of COVID-19 with Belief Functions and Deep Neural Network	Dr. E. Saravana Kumar	CSE	SN Computer Science (Springer)	2023	2661-8907	https://link.springer.com/journal/42979	https://link.springer.com/article/10.1007/s42979-022-01593-0	Scopus
10	Reliable and Accurate Plant Leaf Disease Detection with Treatment Suggestions Using Enhanced Deep Learning Techniques	Dr. E. Saravana Kumar	CSE	SN Computer Science (Springer)	2023	2661-8907	https://link.springer.com/journal/42979	https://link.springer.com/article/10.1007/s42979-022-01589-w	Scopus
11	A Comprehensive Study of LB Technique in Cloud Infrastructure	Dr. E. Saravana Kumar	CSE	SN Computer Science	2023	2661-8907	https://link.springer.com/journal/42979	https://link.springer.com/article/10.1007/s42979-022-01588-x	Scopus

				(Springer)					
12	Performance Analysis of Rice Plant Diseases Identification and Classification Methodology	Dr. E. Saravana Kumar	CSE	Wireless Personal Communications (Springer)	2023	1572-834X	https://link.springer.com/journal/11277	https://doi.org/10.1007/s11277-023-10333-3	Scopus
13	A Comprehensive Survey of Pneumonia Diagnosis: Image Processing and DeepLearning Advancements	Ms.S.Visalini	ISE	IEEE explorer	2023	2473-2001	https://ieeexplore.ieee.org/xpl/conhome/10424966/proceeding	https://ieeexplore.ieee.org/document/10426403	Google Scholar
14	Trends and Challenges of Block Chain in Electronic Health Record System	C A Bindyashree	ISE	IEEE explorer	2023	2473-2001	https://ieeexplore.ieee.org/xpl/conhome/10275782/proceeding	https://ieeexplore.ieee.org/abstract/document/10276025	Google Scholar
15	Context Monitoring of Patients using Wireless Network	Dr.Vanaja Roseline	ISE	IEEE	2023	767-7788	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10134482	Scopus

16	Optomechanical behaviour of optical sensor for measurement of Wagon weight at different speeds of the train	S Mishra, P Sharan, K Saara	ECE	Journal of Optics	2023	0974-6900	https://link.springer.com/journal/12596	https://link.springer.com/article/10.1007/s12596-022-01047-z#citeas	Scopus
17	Implementation of digital differentiator and digital integrator using quantum dot cellular automata	P Sharan, AM Upadhyaya, MS Manna	ECE	Journal of Optics	2023	0974-6900	https://link.springer.com/journal/12596	https://link.springer.com/article/10.1007/s12596-022-01083-9	Scopus
18	1-Dimensional Silicon Photonic Crystal Pressure Sensor for the Measurement of Low Pressure	RB Gowda, P Sharan, K Saara	ECE	Results in Optics	2023	2666-9501	https://www.sciencedirect.com/journal/results-in-optics	https://doi.org/10.1016/j.rio.2023.100352	Scopus
19	The development of laboratory downscale rail-wheel test rig model with optical sensors	Preeta Sharan, Suchandana Mishra, Anup M	ECE	Optical Fiber Technology	2023	2089-4864	https://www.sciencedirect.com/journal/optical-fiber-technology	https://doi.org/10.1016/j.yofte.2023.103287	SCI

		Upadhayaya							
20	Design and Development of Intelligent Ambulance Concept using AIML IOT and Human interface technologies	Dr Manju Devi,Vijayalakshmi V S, Iffat Fatima, Rashmi R ,Dr Suhasini V K,Dr Pavithra G	ECE	Journal of European chemical bulletin	2023	2063-5346	https://www.eurchembull.com/	https://www.eurchembull.com/uploads/paper/f88cf65b03a3b3d11e6b826bb46e4d31.pdf	Google Schoalr
21	Analysis and Implementation of multimedia traffic based on IPV4-IPV6 tunneling	Jayaraj N, Dr.Sivakumar	ECE	IEEE	2023	1125-465	https://ieeexplore.ieee.org/Xplore/home.jsp	http://dx.doi.org/10.1109/IADCC.2015.7154864	Google Schoalr
22	Pre-current amplifier based trans-impedance	Dr.Manju Devi	ECE	IJRES	2022	2089-4864	https://ijres.org/	https://ijres.iaescore.com/index.php/IJRES/article/view/20442	Google Schoalr

	amplifier for biosensors								
23	"Improved Surface Plasmo× Effect in Ag-based SPR Biosensor with Graphene and WS2:An Approach Towards Low Cost Urine-Glucose Detection, Plasmonics,	Dr.Preeta sharan	ECE	Plasmonics	2023	1557-1963	https://link.springer.com/journal/11468	https://link.springer.com/article/10.1007/s11468-023-01945-3	SCI
24	"Design of optical sensor for cancer prognosis prediction using artificial intelligence",	Dr.Preeta sharan	ECE	Journal of Optics	-2023	0974-6900	https://link.springer.com/journal/12596	https://link.springer.com/article/10.1007/s12596-023-01281-z#citeas	Scopus
25	Highly sensitive temperature sensor using one-dimensional Bragg Reflector for biomedical applications	Dr.Preeta sharan	ECE	Biomedical Engineering / Biomedizinische Technik	2023	1862-278X	https://www.degruyter.com/journal/key/bmte/html?lang=en	https://doi.org/10.1515/bmt-2022-0482	SCI

26	”N× N Clos Digital Cross-Connect Switch Using Quantum Dot Cellular Automata (QCA). Computer Systems Science &	Dr.Preeta sharan	ECE	Computer Systems Science and Engineering	2023	0267-6192	https://www.techscience.com/journal/csse	https://www.techscience.com/csse/v45n3/50733	SCI
27	Women Safety Using Cloud Messaging Technology	Dr.V.Vijaya Kumari	ECE	Journal for Basic Sciences	2023	1006-8341	https://fzgxjckxxb.com/	https://drive.google.com/file/d/1TApg2Gp0JHoKo9nuivbOIJicZ5gQK7n9/view	Scopus
28	Bragg reflector one-dimensional multi-layer structure sensor for the detection of thyroid cancer cells	Preeta Sharan	ECE	TELKOMNIKA (Telecommunication Computing Electronics and Control)	2023	2302-9293	https://telkomnika.uad.ac.id/index.php/TELKOMNIKA	http://telkomnika.uad.ac.id/index.php/TELKOMNIKA/article/view/24282	Scopus
29	Comparative analysis and design	Preeta Sharan	ECE	Journal of Optics	2023	0972-8821	https://link.springer.com/journal/12596	https://link.springer.com/article/	Scopus

	of high-performance photonic crystal add–drop filter for optical switching							10.1007/s12596-022-01004-w	
30	Two-Dimensional Photonic Crystal Biosensor Based on Gallium Arsenide Composite Semi-conductive Material for Diabetes Detection	Preeta Sharan	ECE	Plasmonic	2023	1557-1955	https://link.springer.com/journal/11468	https://link.springer.com/article/10.1007/s11468-023-01857-2	SCI
31	Numerical modelling of 1-dimensional silicon photonic crystal sensor for hydrostatic pressure measurement	Preeta Sharan	ECE	Zeitschrift für Naturforschung A	2023	1865-7109	https://www.degruyter.com/journal/key/zna/html?lang=de&srsltid=AfmBOorhq49nJEOgTVZKH7EJP41UMPatpB1qWmmb0FV0nA4hLAAAEeq4	https://www.degruyter.com/document/doi/10.1515/zna-2022-0261/html	SCI
32	Design of Two-Dimensional Photonic Crystal Defect Microcavity	Preeta Sharan	ECE	Silicon	2023	1876-9918	https://link.springer.com/journal/12633	https://link.springer.com/article/10.1007/s12633-023-02448-w	SCI

	Sensor for Biosensing Application								
33	Highly sensitive bimetallic-metal nitride SPR biosensor for urine glucose detection	Preeta Sharan	ECE	IEEE Transactions on NanoBioscience	2023	1558-2639	https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=7728	https://ieeexplore.ieee.org/abstract/document/10049133	SCI
34	Effect of 2-D nanomaterials on sensitivity of plasmonic biosensor for efficient urine glucose detection	Preeta Sharan	ECE	Frontiers in Materials	2023	22968016	https://www.frontiersin.org/journals/materials	https://www.frontiersin.org/articles/10.3389/fmats.2022.1106251/full	SCI
35	Simulation and excitation analysis of nano aperture-array for surface plasmon based memory applications	Preeta Sharan	ECE	International Journal of Information Technology	2023	2511-2104	https://link.springer.com/journal/41870	https://link.springer.com/article/10.1007/s41870-022-01100-x	Scopus
36	Novel design of reversible latches	Preeta Sharan	ECE	International	2023	2511-2104	https://link.springer.com/journal/41870	https://link.springer.com/article/	Scopus

	using feynman gate and implementation of reversible combinational circuits			Journal of Information Technology				10.1007/s41870-022-01082-w	
37	Optofluidic photonic crystal micro sensor for enhanced detection of infectious diseases	Preeta Sharan	ECE	Engineering Research Express, IOP Science	2023	2631-8695	https://iopscience.iop.org/journal/2631-8695	https://iopscience.iop.org/article/10.1088/2631-8695/ad16a3/meta	Scopus
38	Improved Surface Plasmon Effect in Ag-based SPR Biosensor with Graphene and WS2: An Approach Towards Low Cost Urine-Glucose Detection	Preeta Sharan	ECE	Plasmonic, Springer	2023	1557-1963	https://link.springer.com/journal/11468	https://link.springer.com/article/10.1007/s11468-023-01945-3	Scopus/SCIE
39	Real-time implementation of optical sensor on	Preeta Sharan	ECE	Journal of Optics, Springer	2023	0974-6900	https://link.springer.com/journal/12596	https://link.springer.com/article/10.1007/s12596-023-01431-3	Scopus

	lab rig model for speed estimation								
40	Effect of 2-D nanomaterials on sensitivity of plasmonic biosensor for efficient urine glucose detection	Preeta Sharan	ECE	Frontiers in Materials	2023	2296-8016	https://www.frontiersin.org/journals/materials	https://www.frontiersin.org/articles/10.3389/fmats.2023.1333014/full	Scopus/SCI
41	Measurement model of integrated FBG sensor for beam structure	Preeta Sharan	ECE	Journal of Optics, Springer	2023	0974-6900	https://link.springer.com/journal/12596	https://link.springer.com/article/10.1007/s12596-023-01441-1	Scopus
42	Two-dimensional photonic crystal biosensor based on gallium arsenide composite semi-conductive material for diabetes detection	Preeta Sharan	ECE	Plasmonic, Springer	2023	1557-1963	https://link.springer.com/journal/11468	https://link.springer.com/article/10.1007/s11468-023-01857-2	Scopus/SCIE
43	Design of Two-Dimensional Photonic Crystal Defect Microcavity	Preeta Sharan	ECE	Silicon, Springer	2023	1876-9918	https://link.springer.com/journal/12633	https://link.springer.com/article/10.1007/s12633-023-02448-w	Scopus /SCIE

	Sensor for Biosensing Application								
44	Comparative analysis and design of high-performance photonic crystal add–drop filter for optical switching	Preeta Sharan	ECE	Journal of Optics, Springer	2023	0974-6900	https://link.springer.com/journal/12596	https://link.springer.com/article/10.1007/s12596-022-01004-w	Scopus
45	Early Detection of The Glaucoma and Other Intra-Ocular Pressure Elevation Diseases Using Hardware Efficient Machine Learning Approach	Remya Bharathy	ECE	International Journal For Multidisciplinary Research	2023	E-ISSN: 2582-2160	https://www.ijfmr.com/about-journal.php	https://doi.org/10.36948/ijfmr.2023.v05i05.6685	Scopus
46	Women Safety Using Cloud Messaging Technology	Dr.V.Vijaya Kumari	ECE	Journal For Basic Sciences	2023	ISSN NO : 1006-8341	https://fzgxjckxxb.com/	https://fzgxjckxxb.com/volume-23-issue-2-2023/	UGC
47	Comparison of Face Recognition	Dr.V.Vijaya Kumari	ECE	Advances and challeng	2023		https://www.bookpi.org/bookstore/product/advances-and-	https://doi.org/10.9734/bpi/acst/v9/6966C	Google Scholar

	Using PCLDA and Neural Network			es in science and technology			challenges-in-science-and-technology-vol-1/		
48	BALLORG: state of the art Image restoration Using Block-Augmented Lagrangian and Low-Rank gradients	Dr.Laya Tojo, Dr Manju Devi	ECE	IEIE Transaction on Smart Processing & Computing	2023	2287-5255	https://www.dbpia.co.kr/	https://doi.org/10.5573/IEIESPC.2023.12.1.1	SCI
49	Real time implementation of fiber Bragg grating sensor in monitoring flat wheel detection for railways	Preeta Sharan	ECE	Engineering Failure Analysis	2023	1350-6307	https://www.sciencedirect.com/journal/engineering-failure-analysis	https://www.sciencedirect.com/science/article/abs/pii/S1350630722003508	SCI
50	THD minimization of ZVT -ZCT Quasi Resonant SEPIC Converter with proposed	Nisha C Rani, Dr N Amuthan	EEE	IEEE Explore	2023	2473-2001	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10112420	Scopus

	Harris Hawks Optimization Technique								
51	Design and Analysis of Pressure Sensor based on Micro Hole Photonic Crystal Slab	Preetam Ambudkar;Anup M Upadhayaya;Preeta Sharan;Nisha C Rani	EEE	IEEE Explore	2023	2473-2001	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10112526	Scopus
52	Design and Implement a Quasi-resonant Cuk Converter for Photovoltaic Applications"	Nisha C Rani	EEE	IEIE Transactions on Smart Processing and Computing, vol. 12, no. 5	2023	2287-5255	https://www.dbpia.co.kr/	https://doi.org/10.5573/IEIESPC.2023.12.5.448	Scopus
53	"Grid Connected PV based on Quasi Resonant Zeta	Nisha C Rani	EEE	International Journal	2023	Electronic ISSN2511-2112	https://link.springer.com/journal/41870	https://link.springer.com/article/	Scopus

	Converter with Harris Hawk Optimization Algorithm for the Implementation of PI Controller",			of Information Technology (BJIT) , Springer.		Print ISSN 2511-2104		10.1007/s41870-023-01594-z	
54	THD minimization of ZVT -ZCT Quasi Resonant SEPIC Converter with proposed Harris Hawks Optimization Technique.	Nisha C Rani	EEE	IEEE Xplorer	2023	ISBN:978-93-80544-47-2	https://ieeexplore.ieee.org/document/10112420	https://ieeexplore.ieee.org/document/10112420	Scopus
55	Design and Analysis of Pressure Sensor based on Micro Hole Photonic Crystal Slab.	Nisha C Rani	EEE	IEEE Xplorer	2023	ISBN:978-93-80544-47-2	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10112526	Scopus
56	Space vector Pulse Width Modulation with 7 Level ANPC Converters	Resna S R	EEE	IEEE Xplorer	2023	ISBN:979-8-3503-3624-5	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10117778	Scopus

	for Capacitor Voltage Balancing								
57	Space vector Pulse Width Modulation with 7 Level ANPC Converters for Capacitor Voltage Balancing	Resna S R	EEE	IEEE Explore	2023	979-8-3503-3624-5	https://ieeexplore.ieee.org/Xplore/home.jsp	https://ieeexplore.ieee.org/document/10117778	Goolge Scholar
58	Implementation of digital differentiator and digital integrator using quantum dot cellular automata	Anup M Upadhyaya, Preeta Sharan, Maneesh C Srivastava	Mechanical Engg.	Journal of Optics	2023	0974-6900	https://link.springer.com/journal/12596	https://link.springer.com/article/10.1007/s12596-022-01083-9	Scopus
59	High temperature erosion performance of NiCrAlY/Cr2O3/YSZ plasma spray coatings	GMS Reddy, CD Prasad, P Patil, G Shetty, N Kakur,	Mechanical Engg.	Transactions of the IMF	2023	1745-9192	https://www.tandfonline.com/journals/ytim20	https://www.tandfonline.com/doi/abs/10.1080/00202967.2023.2208899	Scopus

		MR Ramesh							
60	Investigation of High-Temperature Erosion Behavior of NiCrAlY/TiO2 Plasma Coatings on Titanium Substrate	G Madhu Sudana Reddy, C Durga Prasad, Shanthala Kollur, Avinash Lakshmikanthan, R Suresh Kumar, CR Aprameya	Mechanical Engg.	Advanced Functional and Structural Thin Films and Coatings	2023	1543-1851	https://link.springer.com/article/10.1007/s11837-023-06327-y	https://link.springer.com/article/10.1007/s11837-023-05894-4	Scopus
61	Design of Two-Dimensional Photonic Crystal Defect Microcavity Sensor for Biosensing Application	Anup M Upadhyaya	ME	Silicon, Springer	2023	1876-9918	https://link.springer.com/journal/12633	https://link.springer.com/article/10.1007/s12633-023-02448-w	Scopus /SCIE

62	Microstructure, mechanical and wear properties of SiC and Mo reinforced NiCr microwave cladding	Raviprakash M	ME	Advances in Materials and Processing Technologies, Taylors and Francis	2023	2374-068X	https://www.tandfonline.com/journals/tmpt20	https://www.tandfonline.com/doi/abs/10.1080/2374068X.2023.2257937	Scopus
63	High temperature erosion performance of NiCrAlY/Cr2O3/YSZ plasma spray coatings	Madhu Sudana Reddy G	ME	Transcations of IMF, taylors and Francis	2023	17459192	https://www.tandfonline.com/journals/ytim20	https://www.tandfonline.com/doi/abs/10.1080/00202967.2023.2208899	Scopus
64	Optofluidic photonic crystal micro sensor for enhanced detection of infectious diseases	Anup M Upadhyaya	ME	Engineering Research Express, IOP Science	2023	2631-8695	https://iopscience.iop.org/journal/2631-8695	https://iopscience.iop.org/article/10.1088/2631-8695/ad16a3/meta	Scopus

65	Effects of Polypropylene Waste Addition as Coarse Aggregates in Concrete: Experimental Characterization and Statistical Analysis	D. C. Naveen, K. Naresh ,B. S. Keerthi Gowda ,Madhu Sudana Reddy G ,C. Durga Prasad,and Ragavanantham Shanmugam	ME	Advances in Materials Science and Engineering	2023	1687-8434	https://onlinelibrary.wiley.com/journal/5928	https://www.hindawi.com/journals/amse/2022/7886722/	Scopus
66	Seismic Behavior of High Rise Structure with Plan Irregularity	Shivanand C.G, Charan M Kudtarkar, Dhanyas	Civil Engineering	IJESC	2023	2321-3361	https://www.journalsindexed.com/2021/02/international-journal-of-engineering_10.html	https://drive.google.com/file/d/1erLdopyIcffGyVhJNnCpptyMfRquazVJ/view?usp=sharing	Goolge Scholar

		hree G.B, Prakash N							
67	Seismic Response Of High Rise Structure With Vertical Irregularity	Shivanand C.G, Dhanyashree G B, Charan M Kudarkar	Civil Engineering	IJESC	2023	2321-3361	https://www.journalsindexed.com/2021/02/international-journal-of-engineering_10.html	https://drive.google.com/file/d/1SEPY1FhOv9Aeo2eupMindbULlz7r53_N/view?usp=sharing	Goolge Scholar
68	Construction Sequence Analysis of G+30 RCC, Steel Residential Building with Floating Column	Prashanth Hathwar T.S, Mohammad Rizwanuddin	Civil Engineering	IJERT	2023	2278-0181	https://www.ijert.org/	https://www.ijert.org/construction-sequence-analysis-of-g-30-rcc-steel-residential-building-with-floating-colum	Goolge Scholar
69	Statistical Optimization of Crude Oil Degradation using Bacterial	Indulekha John, Valarmathy K. and	BT	Research Journal of Biotechnology	2023	ISSN: 0973-6263	https://worldresearchersassociations.com/biotech.aspx	https://doi.org/10.1016/j.jgeb.2018.01.001	Scopus

	Consortium and their Enzymes	Manjunatha B.K							
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101	Survey on Timing Error Detection and Correction Methods for Fir Filter Applications(book chapter)	Dr.V.Vijaya Kumari	ECE	Theory and Applications of Engineering Research ,BP International	2024	ISBN: 978-81-971580-5-6	https://www.bookpi.org/	https://stm.bookpi.org/TAER-V8/article/view/13789	Google Scholar
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147	A Comparative Study of BSE Listed Sectoral Indices of Real Estate and Banking Industry	Dr V Lakshmi Suneetha	MBA	International Journal of Management, Technology and Social Sciences	2024	2581-6942.	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4769976	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4769976	Google Scholar

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148	A Study on Effect of Job Satisfaction, Stress and Emotional Intelligence on Job Performance among HEI Faculty Members	Dr Sahana A & Dr V Lakshmi Suneetha	MBA	Proceedings of the 3rd International Conference on Reinventing Business Practices, Start-ups and Sustainability (ICRBSS 2023)	2024	2352-5428	https://www.atlantis-press.com/proceedings/icrbss-23/125998438	https://www.atlantis-press.com/proceedings/icrbss-23/125998438	Google Scholar
149	A Sectoral Analysis of BSE-Listed Indian Pharma Companies	Dr V Lakshmi Suneetha	MBA	International Journal of Case	2024	2581-6942	https://www.supublication.com/index.php/ijcsbe/article/view/1152	https://www.supublication.com/index.php/ijcsbe/	Google Scholar

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153	Revving Up or Stalling Out? A Comprehensive SWOC Analysis of BSE listed India's Auto Sector	Dr V Lakshmi Suneetha	MBA	International Journal of Management, Technology and Social Sciences	2024	2581-6012	https://supublication.com/index.php/ijmts/index	https://supublication.com/index.php/ijmts/article/view/1222	Google Scholar

154	FBG Sensor Design and Analytics for Early Detection of Cancer	Mary Anitha T	MCA	IEEE	2024	1803-7232	https://ieeexplore.ieee.org/xpl/conhome/10498128/proceeding	https://ieeexplore.ieee.org/document/10498873	Scopus
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Date of Conference: 23-25 March 2023

DOI: 10.1109/ICSCDS56580.2023.10104589

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At present, the entire world has suffered a lot due to the spike of COVID disease. Despite the world has been developed with so much of technology in the domain of medicine, this is a very huge challenge in all over the world. Though, there is a rapid development in medical field, those are not even sufficient to diagnose the symptoms of this COVID in earlier stage. Since the spread of this disease in all over the world, it affects the livelihood of the human. Computed Tomography (CT) images have given necessary data for the radio diagnostics to detect the COVID cases. Therefore, this paper addressed about the classification techniques

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Abstract

For agriculture to be sustainable, it is essential to monitor a plant's health and look for diseases. It is quite challenging to manually monitor plant diseases. To improve the plant lifetime, plant disease must be effectively identified. Several diseases cause the plant's leaves to die. In some cases, farmers face issues in finding the type of leaf disease as well as its future symptoms. The proposed plant leaf disease detection scheme uses enhanced deep learning techniques to find causes of leaf disease and offer treatment suggestions. The proposed work relies on Tensor Flow to identify illnesses in plant leaf pictures. The proposed

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Abstract:
Every parent is curious about their child's internal and exterior development. Childhood is the first stage of a person's existence. To comprehend and better explain many elements of action, including the emotional, physical, social, intellectual, perceptual, and personality development, extensive research has been done in the past. Child development analysis is a scientific approach to evaluate growth, change, and stability. By learning more about how and why individuals develop and grow, one may better understand and meet a child's needs, allowing them to realize their full potential. Child development has a broad scope and a general purpose. However, just a few studies on early childhood development have been conducted. The project's objective is to use machine learning algorithm to forecast a child's future learning behavior and talents using a random forest algorithm and data-mining approach.

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Date of Conference: 12-13 May 2023

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Published in: 2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)

Date of Conference: 23-25 March 2023

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Original Research Published: 23 January 2023

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E. Saravana Kumar, P. Ramkumar, H. S. Naveen, Raghu Ramamoorthy & R. Ch. A. Naidu

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Abstract

At present, the entire world has suffered a lot due to the spike of COVID disease. Despite the world has been developed with so much of technology in the domain of medicine, this is a very huge challenge in all over the world. Though, there is a rapid development in medical field, those are not even sufficient to diagnose the symptoms of this COVID in earlier stage. Since the spread of this disease in all over the world, it affects the livelihood of the human. Computed Tomography (CT) images have given necessary data for the radio diagnostics to detect the COVID cases. Therefore, this paper addressed about the classification techniques

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Original Research Published: 11 January 2023

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Aims and scope

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For agriculture to be sustainable, it is essential to monitor a plant's health and look for diseases. It is quite challenging to manually monitor plant diseases. To improve the plant lifetime, plant disease must be effectively identified. Several diseases cause the plant's leaves to die. In some cases, farmers face issues in finding the type of leaf disease as well as its future symptoms. The proposed plant leaf disease detection scheme uses enhanced deep learning techniques to find causes of leaf disease and offer treatment suggestions. The proposed work relies on Tensor Flow to identify illnesses in plant leaf pictures. The proposed

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Survey Article Published: 25 January 2023

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In the recent Web-based knowledge transfer, cloud computing is essential. The real world has been changed into a virtual one as a result of the pandemic scenario. Cloud computing plays a major role for storing and computing data using remote computing infrastructure for day-to-day activities. The primary concern in cloud computing is distributing information technology (IT) resources efficiently to record the user requests in a short duration. Load-balancing (LB) techniques distribute the system's load among its various nodes to maximize resource usage and user satisfaction. It identifies the heavy loaded and lightly loaded IT resources and balances the task among the clusters. Load balancing ensures that each node in the network shortens reaction times, utilizes optimal resource and boosts performance. To upgrade the performance metrics in cloud computing (CC), various categories of LB techniques have been developed. This survey evaluates the

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Performance Analysis of Rice Plant Diseases Identification and Classification Methodology

Published: 20 March 2023

Volume 130, pages 1317–1341, (2023) Cite this article

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Aims and scope

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M. Tholkapiyan, B. Aruna Devi, Dhowmya Bhatt, E. Saravana Kumar, S. Kirubakaran & Ravi Kumar

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Abstract

Technological help can be used for improving the cultivation of critical crops for optimal production and quality. Automatic plant disease detection is an interesting study issue as it may be beneficial for the monitoring of vast agricultural fields and thus the automatic identification of disease by the symptoms in the various sections of plants. This work contributes an automated diagnosis of different rice-related diseases utilizing image processing, deep learning, machine learning, and methods for meta-heuristic optimization. These measures include picture dataset size, class numbers, preprocessing procedures, classification approaches, performance analysis, etc. Researches from the previous decade

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Publisher: IEEE Cite This PDF

S. Visalini ; R. Kanagavalli **All Authors** •••

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Pneumonia is a major global health concern, and early, accurate diagnosis is crucial for effective treatment and better patient outcomes. Recent advances in medical imaging and deep learning have transformed pneumonia diagnosis. This comprehensive survey explores the latest methods and innovations in pneumonia diagnosis, with a focus on image processing and deep learning. It provides background information on pneumonia, its challenges, and the role of medical imaging in improving diagnosis. The survey covers different imaging modalities, such as chest X-rays and CT scans, and discusses image pre-processing techniques, including lung segmentation. It also delves into deep learning models like Convolutional Neural Networks (CNNs) and their application in medical image analysis. The survey categorizes and analyzes research works on various topics related to pneumonia diagnosis, highlighting trends, commonalities, and gaps in existing research. This study offers a comprehensive overview of advancements in pneumonia diagnosis through image processing and deep learning, serving as a valuable resource for researchers, clinicians, and healthcare professionals interested in this field's current status and future directions.

Published in: 2023 3rd International Conference on Innovative Mechanisms for Industry Applications (ICIMIA)

Date of Conference: 21-23 December 2023 **DOI:** 10.1109/ICIMIA60377.2023.10426403

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C.A. Bindyashree ; Syed Muzamil Basha **All Authors**

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The exponential growth in the quantity of digital information is accumulated in electronic health records. Electronic health records are now booming in providing patients, doctors and health care management in examining the profiles of patients and giving proper treatment when emergency. Thus, it has also led to huge impetus on exploiting the EHR to aid clinical decision support systems. The enormous increase of data breach, criminal deception, unjustifiable claiming and thefts in patients' data make difficult for health care systems to provide quality oriented care to patients by contradict it needs an effective authentication mechanisms and secured data storage. Blockchain technology recently have immensely attracting the healthcare industries with its storage methods, distributed and immutability nature of securing the data. There is a growing research body in this direction to develop useful insights for secured EHR. The main objective of the research is to identify various methods, frameworks, regulations and perform an extensive review. Recent advances in deep learning techniques with blockchain technology have contributed to secure applications using EHR. Towards this, overview of recent advancements and techniques employed to analyze EHR data securely is introduced. Reviews of the literature discuss the challenges of different approaches. In addition to that effective cryptographic authentication mechanisms that aid future research improvements and trigger innovative applications in healthcare will be highly beneficial for deploying an improved block chain security framework.

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Abstract:
In many hospitals, doctors attend to patients either once or twice per day. A situation may arise in which the patient's health worsens during the time if a doctor is unavailable to the patient, and the patient may die as a result. Most problems in today's world are caused by a lack of efficient therapy and appropriate monitoring within the required time period. To solve these issues with the current method, this research study proposes a health monitoring framework using wireless technology, in which the patient's health is followed and communicated to the physician throughout the entire day. The Internet of Things (IoT) is an emergent technology that uses wireless networking phenomenon to transmit data. The advantage of using IoT-based healthcare monitoring systems is that they can assess many physiological characteristics of the human body and is simpler, more accurate, and more precise than traditional methods. Sensors are utilized to measure the patient's bodily functions over a wireless network. The data from the sensors is gathered and communicated to the cloud through a Wi-Fi module linked to the microprocessor. The data is stored in the cloud, and feedback mechanisms are done on the stored data, which may be analyzed distantly by a physician. Virtual monitoring relieves doctors' workload and offers patients accurate health conditions. The proposed system results suggest that the physiological sensor is more effective in terms of availability and portability. The proposed system is easy to use, will save money, and will change how hospitals work in the future.

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This work includes the design and simulation of optical fiber as strain sensor to measure equivalent elastic strain generated on the rail due to the load of the train wagon at different speeds when train passes over it. It presents a behavioural study of maximum elastic strain and von Mises stress due to wheel-rail contact of a freight train with varying speed from 20 to 80 km/h. It is observed that, a maximum stress of 1016.4 MPa, a strain of 708.8 $\mu\varepsilon$, and a total deformation of 1.8029 mm, is obtained after experimentation at a constant wagon weight of 57.3 t. At 80 km/h, the shift in Bragg's wavelength is 1559.35 nm. In the first part,

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Research Article Published: 06 January 2023

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Preeta Sharan, Anup M. Upadhyaya & Manpreet Singh Manna

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Abstract

Current CMOS (Complementary metal–oxide–semiconductor) technology is no longer constrained in scaling by short channel effects. The semiconductor industry has developed a number of substitute technologies, including quantum-dot cellular automata, to get around these restrictions (QCA). In this study, a novel technique for developing digital differentiators and integrators is presented, employing QCA Technology as a key component. In order to design the digital differentiator focus has been given on no recursive simple tapped delay line differentiator called first difference differentiator and central

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1-Dimensional silicon photonic crystal pressure sensor for the measurement of low pressure

Ranjith B. Gowda [a b], Preeta Sharan [c], K. Saara [a]

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Abstract

In this article we proposed a one-dimensional (1D) silicon photonic-crystal (PC) as a highly sensitive pressure sensor to measure the applied hydrostatic pressure. A 1D flexible silicon layer is formed at the top of the proposed structure. The proposed sensor is designed to measure the low pressure in the range of 10kpa to 20kpa. An FEM tool Comsol Multiphysics is used to design, simulate and analyze the structure. A central cavity is created to support the resonant mode and shift in the resonant mode is observed with the varying boundary load. With the variation in the applied pressure from 10kpa to 20kpa, shift in the resonant mode towards higher wavelength region was observed. The defect cavity length and number of layers were tuned to get optimized results. The novelty of this work includes, use of silicon material to sense the applied pressure, design and its simulation to obtain electric field distribution in the multi-layer structure and its analysis for sensing the applied boundary load using an FEM tool. Simulation results shows that the proposed sensor has a [illegible]4 with the transmission of 99.99%.

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Keywords

Photonic crystal; Pressure sensor; Multi-layer structure; FEM; Transfer matrix

1. Introduction

Low pressure measurement is one of the crucial demand in many industrial and biomedical applications (Pandey and Yadav, 2006, Pinet, 2011, Roriz et al., 2013). In industrial applications, pressure is frequently measured using electromechanical devices. These devices' accuracy for measuring low pressures is extremely minimum, making them less trustworthy. These devices are not appropriate for use in environments with strong EMI, hard operating circumstances, the usage of explosive substances, and high vibrational and temperature conditions. To get around these obstacles, pressure is measured using optical devices, and several kinds of optical sensors have been researched in the literature (Upadhyaya et al., 2021, Olyaee and Dehghani, 2012, Yu et al., 2019). The paradigm guiding the creation of optical sensors is the control of light within the crystal and its interaction with the substance (Joannopoulos et al., 2008). The property of light in PC is also affected by the external parameters like vibrations, pressure, temperature, bio-molecules etc., Photonic crystals (PC) are the materials having periodic variation in the dielectric constant in certain directions. PC's can be one, two or three dimensional structures based on their dielectric variation respectively in one, two or in three directions. Photonic band gap (PBG) is the paramount property of the PC which contains the range of frequencies prohibiting from propagation through PC. High accuracy, no EMI, light weight, reduced size, minimum sample requirement and ease of integration with the other devices are the major advantages of PC to consider them for sensing applications. Because of the advanced micro-machining techniques, PC based sensor occupies large application areas viz, bio-sensors (Inan et al., 2017, Konopsky et al., 2013), pressure sensors (Upadhyaya et al., 2021, Olyaee and Dehghani, 2012), force sensors (Yang et al., 2014), vibration sensors (Yu et al., 2019), temperature sensors (Wu et al., 2018), energy and civil engineering applications (Pinet et al., 2007, Pinet et al., 2010) and so on. The new application areas like Communication and quantum computing devices are also possible with the photonic crystals (Sharma et al.,

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Magnetic field, temperature, pressure and other external parameters influences the dielectric constant of a PC (Porras-Montenegro and Duque, 2010, Xu et al., 2003, González and Porras-Montenegro, 2012, Herrera et al., 2018). Light propagation property and hence PBG of the material changes with these external physical parameters. These external physical quantities can be measured by observing propagation of light through PC structures. Proposed work describes the design and analysis of 1D PC for low pressure measurement (in the range of kpa). Researchers investigated a lot of PC based pressure sensors and they can be found in the literature (Upadhyaya et al., 2021, Olyaee and Dehghani, 2012, Vijaya Shanthi and Robinson, 2014). The effect of applied hydrostatic pressure on the PBG of photonic crystals is discussed in detail in the Refs. (Porras-Montenegro and Duque, 2010, Herrera et al., 2018, Segovia-Chaves and Vinck-Posada, 2018). External pressure influence on the forbidden frequencies was discussed by F. Segovia et al. (Segovia-Chaves and Vinck-Posada, 2018). Dielectric permittivity of the material changes with the applied pressure and which intern affects the PBG (Samara, 1983) of a PC. Among different type of photonic crystal sensors, 1D PC's are the best choice as they have simple structure, easy modelling, analysis and fabrication process as compared to 2D and 3D structures.

2. Mathematical modelling

Theoretical modelling of 1D PC structures can be done by using Transfer Matrix Method (TMM). In 1D PC, the dielectric variation is in one direction and has fixed number of layers called period (N). In the proposed PC structure, a flexible silicon layer on the top acts as a pressure sensing layer. Two dimensional top view of flexible sensing layer is as shown in Fig. 1. The first layer is a superstrate (air), followed by alternate regions of high index (HH) layer (silicon) and low index (LL) layer (air) and then final high index layer (SiO_2). It is represented as [Superstrate/$(HH/LL)^N$/HH/Substrate]. The thickness of these layers is equal to quarter wavelength of the input light and are denoted as d_{sup}, d_{HH}, d_{LL} and d_{sub} respectively for superstrate, high-index layer, low-index layer and substrate which have corresponding refractive-index (RI) of n_{sup}, n_{HH}, n_{LL} and n_{sub}. Each layer can be represented mathematically using transfer matrix as (Singh et al., 2014, Aly and Zaky, 2019, Zhao et al., 2017, Society, 2017, Yeh et al., 1976, Steen, 1999, Gowda et al., 2021, Gowda et al., 2022, Gowda et al., 2021)

$$M_j = \begin{matrix} \cos(\beta_j) & \frac{i\sin(\beta_j)}{p_j} \\ -ip_j\sin(\beta_j) & \cos(\beta_j) \end{matrix} = \begin{matrix} M_{11} & M_{12} \\ M_{21} & M_{22} \end{matrix}$$

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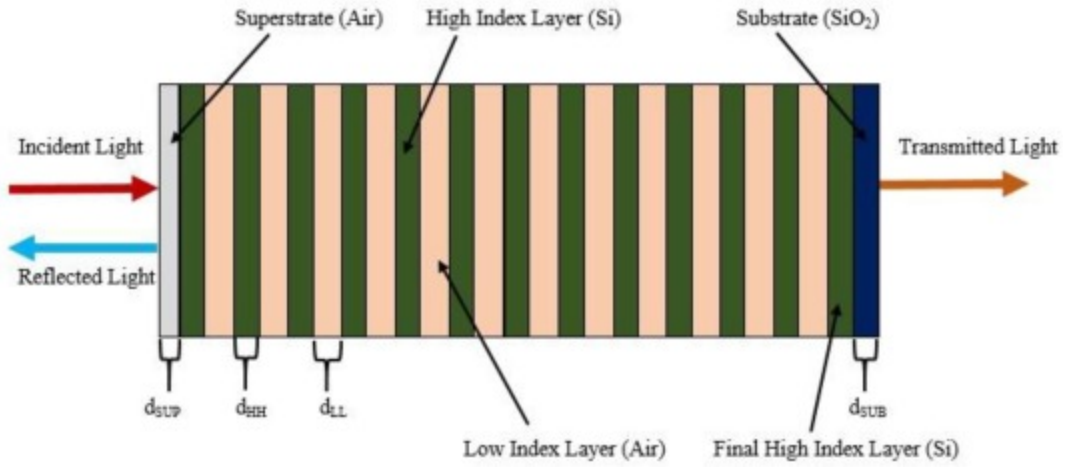

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Fig. 1. Two dimensional top view of the proposed flexible silicon layer.

Which represents the phase variation of the propagating light wave in the jth layer.

$p_j = n_j cos(\theta_j)$ for TE mode and $p_j = \frac{\cos(\theta_j)}{n_j}$ for TM mode with θ being the incidence angle at the interface boundary of each layer.

The transfer matrix (TM) for the entire structure with N number of periods is represented as

$$M = M_j{}^N = \begin{matrix} m_{11} m_{12} \\ m_{21} m_{22} \end{matrix}$$

The TM for the proposed structure with alternate HH and LL layers is represented as

$$M = M_1 M_2{}^{12} M_1$$

Transmission coefficient for the above structure is given by

$$t = \frac{2p_{\text{sub}}}{m_{11} + m_{12} p_{\text{sup}} p_{\text{sub}} + m_{21} + m_{22} p_{\text{sup}}}$$

For TE mode, $p_{\text{sub}} = n_{\text{sub}} cos(\theta_{\text{sub}})$ and.$p_{\text{sup}} = n_{\text{sup}} cos(\theta_{\text{sup}})$

This gives that the percentage of transmission as

$$T(\%) = \frac{p_{\text{sup}}}{p_{\text{sub}}} t^2$$

3. Materials and methods

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1D PC is used to design the proposed pressure sensor. By selectively etching the silicon slab it is possible to form such structure shown in Fig. 1. Etched region acts as a low RI region and remaining silicon region acts as high RI region. Hence there is a periodic RI variation in one direction and acts as a 1D PC. Total number of high and low RI region in the structure is called period (N).

3.1. Material selection

Using silicon-on-insulator (SOI) technology it is possible to fabricate the proposed sensor design (Seshan, 2012, Technology et al., 2014). Silicon material can be used for sensing applications and is widely accepted because of their good accuracy, low power consumption and are capable of operating in high frequency range (Seshan, 2012). Wavelength of the incident light beam is taken as 1.15 μm, which lies in the near-infrared region (0.78–1.4 μm). Such light beams can be generated by using laser light sources (Wang and Rollins, 2007, Kurkov et al., 2010). Silicon micro-structure devices can be operated with these laser pumps. Using laser sources, a very high frequency (in the range of THz) can be obtained (Rogalin et al., 2018). The refractive index of silicon (Si) is 3.42 (Huang, 2003) with the lower absorption coefficient ($<0.6 cm^{-1}$) in the selected operating wavelength (Jones and Jones, 2010). A 1D photonic structures can be fabricated with good accuracy as compared to other types of PC's using advanced micro-machining techniques. Fabrication of 1D PC device can be achieved by using chemical vapor deposition (CVD) method (Goyal et al., 2019, Chen et al., 2004, Stomeo et al., 2010), spin coating method (Shen et al., 2016), sol–gel (Ilinykh and Matyushkin, 2016, Ilinykh and Matyushkin, 2016), magnetron sputtering (Schürmann et al., 2006), molecular beam epitaxy (Nishimoto et al., 2014), reactive ion beam etching (Wahlbrink et al., 2005, Di Trani et al., 2020), dry etching (Solehmainen et al., 2005) and wet etching (Rollo et al., 2019) techniques. The optical thickness of each layer is chosen to be equal to quarter wavelength of the input light to satisfy the Bragg Reflection condition. The elasto-optic constants of silicon material in the selected operating wavelength are listed in Table 1.

Table 1. Elasto-optic constants of Si material (Huang, 2003).

Material	$\lambda_0(\mu m)$	n_0	p_{11}	p_{12}	p_{44}	$C_1(10^{-12}/Pa)$	$C_2(10^{-12}/Pa)$	$C_3(10^{-12}/Pa)$
Silicon	1.15	3.42	−0.101	0.0094	–	−11.35	3.65	–

3.2. Proposed sensor design

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The conceptual structure of the proposed pressure sensor is shown in the Fig. 2. At the top 1D silicon PC structure is formed which is used to sense the applied pressure. Presence of air gap cavity below the sensing layer helps PC structure for flexible movement in downward direction with the applied pressure. Silicon-on-Insulator (SOI) fabrication of such structures is possible and similar structures are fabricated in the literature (Suni et al., 2006, Kluba et al., 2021, Luoto et al., 2007, Young et al., 2004). The deformation of 1D PC changes the dielectric constant of the material and hence its effective refractive-index (Huang, 2003). Proposed structure is designed and analyzed using an FEM tool. The physical dimensions of sensing layer structure are tabulated in Table 2 and Fig. 3 shows its design using an FEM tool. Total height of the sensing layer is 3μm with the width and length equal to optical wavelength (λ) and quarter wavelength (λ/4) of the input light respectively.

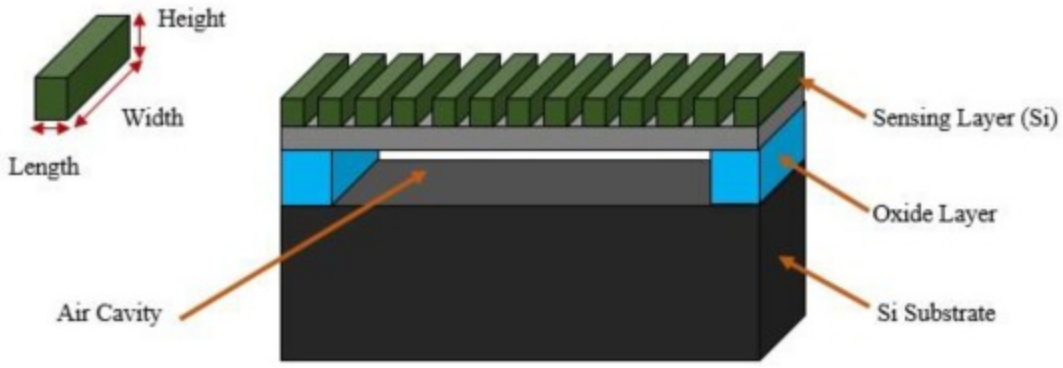

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Fig. 2. Conceptual three dimensional model of the proposed sensor structure.

Table 2. Physical dimensions of the sensing layer of the proposed structure.

Layers	Height (μm)	Width (μm)	Length (μm)
HIL	1	1.15	0.084
LIL	1	1.15	0.2875
Base material	2	1.15	4.542

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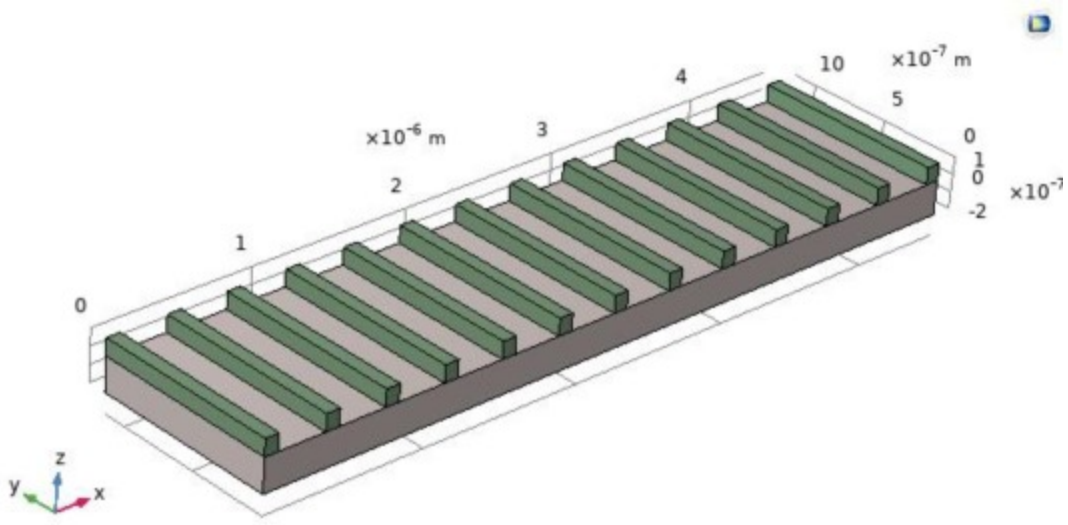

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Fig. 3. 1D PC design of the proposed structure using an FEM tool.

3.3. Pressure sensing principle

Proposed silicon 1D PC structure can be used to detect the applied hydrostatic pressure. With the applied boundary pressure there is a significant change in the optical and electronic properties of the material (Huang, 2003). Dielectric constant of the silicon layer and hence PBG of the structure changes with induced stress which is created due to applied pressure. This change in dielectric constant changes the refractive-index of the material due to elasto-optic effect and it also changes the optical performance of the device. Hence, change in RI of the structure can be used as a sensing parameter to find the applied hydrostatic pressure. Mathematically, the relationship between stress induced and RI of material is represented as (Upadhyaya et al., 2021, Olyaee and Dehghani, 2012, Huang, 2003)

$$\begin{matrix} n_{xx} \\ n_{yy} \\ n_{zz} \\ n_{yz} \\ n_{xz} \\ n_{xy} \end{matrix} = \begin{matrix} n_0 \\ n_0 \\ n_0 \\ 0 \\ 0 \\ 0 \end{matrix} - \begin{matrix} C_1 C_2 C_2 & 000 & \sigma_{xx} \\ C_2 C_1 C_2 & 000 & \sigma_{yy} \\ C_2 C_2 C_1 & 000 & \sigma_{zz} \\ 000 & C_3\ 0\ 0 & \sigma_{yz} \\ 000 & 0\ C_3\ 0 & \sigma_{xz} \\ 000 & 0\ 0\ C_3 & \sigma_{xy} \end{matrix} \quad (1)$$

In the above equation, the stress-optic constants, $C_i\ i = 1, 2, 3$ have the following relationship

$$C_1 = \frac{n_0^3 (p_{11} - 2v p_{12})}{2E}$$

$$C_2 = \frac{n_0^3 [p_{12} - v(p_{11} + p_{12})]}{2E}$$

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$$C_3 = \frac{n_0^3 p_{44}}{2G}$$

where, E, G and v are Young's modulus, Shear modulus and Poisson's ratio respectively.

For isotropic crystals (Upadhyaya et al., 2021, Olyaee and Dehghani, 2012, Huang, 2003)

$$p_{44} = \frac{(p_{11} - p_{12})}{2}$$

$$G = \frac{E}{2(1+v)}$$

Here, p_{11}, p_{12} and p_{44} are the strain optic constants.

The stress in ij plane is denoted as $\sigma_{ij}$and $n_{ij}$is the corresponding change in RI of the material. If the pressure exerted in only one direction (normal to the plane of the PC) then the whole device is under stress. Therefore,

$$\sigma_{xx} = \sigma_{yy} = \sigma_{zz} = \sigma$$

$$\sigma_{xy} = \sigma_{yz} = \sigma_{zx} = 0$$

Hence equation (1) can be rewritten as (Upadhyaya et al., 2021, Olyaee and Dehghani, 2012)

$$n = n_0 - C_1 + 2C_2\sigma \quad (2)$$

The applied pressure exerts stress (σ) on the 1D PC which intern causes change in RI of the silicon material.

Equation (2) shows the relationship between RI of the material and stress induced. Change in the stress induced affects RI of the material and this can be detected by measuring the shift in wavelength of the resonant mode propagating through the structure.

4. Results and discussions

An input light beam of 1.15μm wavelength is made to incident normally on the structure from input side (In the x-direction of Fig. 3). The transmission spectrum obtained for such structures containing band gap region is shown in the Fig. 4. The photonic band gap region exists from 0.84μm to 1.83μm as shown in Fig. 4 and its equivalent frequency domain plot showing band gap region from 163.8THz to 356.7THz is shown in Fig. 5.

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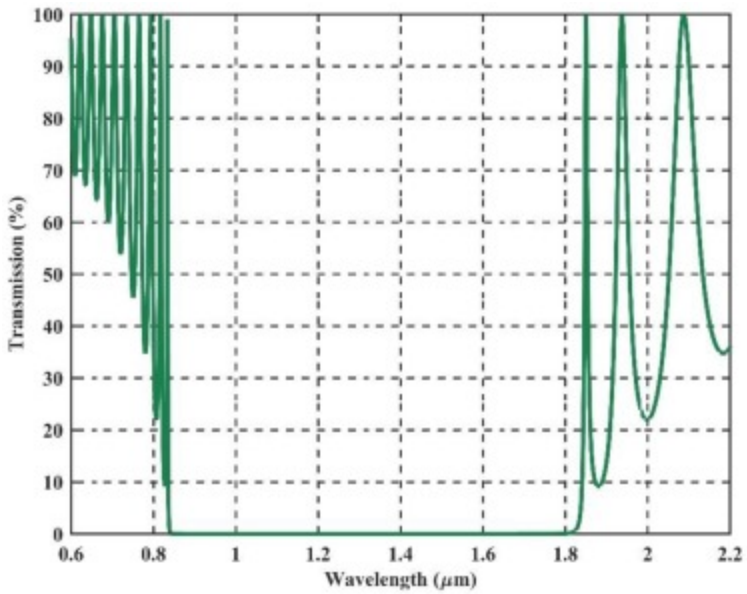

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Fig. 4. Transmission spectrum of proposed sensing layer structure containing PBG in wavelength domain.

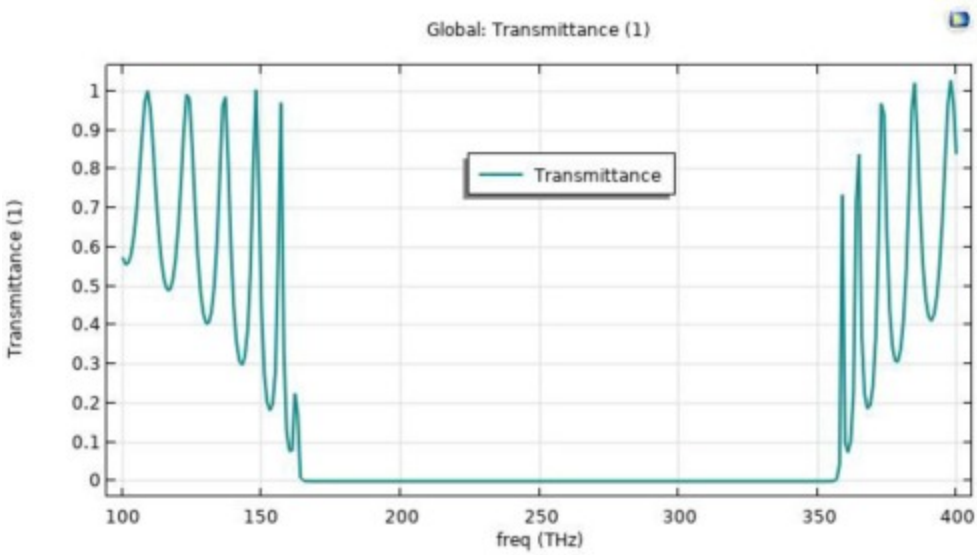

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Fig. 5. Transmission spectrum of proposed sensing layer structure containing PBG in frequency domain.

Fig. 6, Fig. 7 shows the electric field (EF) distribution in the proposed structure. Fig. 6 shows

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Hz which lies in PBG region and Fig.

7 shows EF distribution in the structure at frequency of 393THz which lies outside the bang gap region. It is clearly observed form the EF distribution that 200THz signal can't propagating through the structure as it lies in the band gap region and 393THz signal is allowed for its propagation as it lies outside the band gap region.

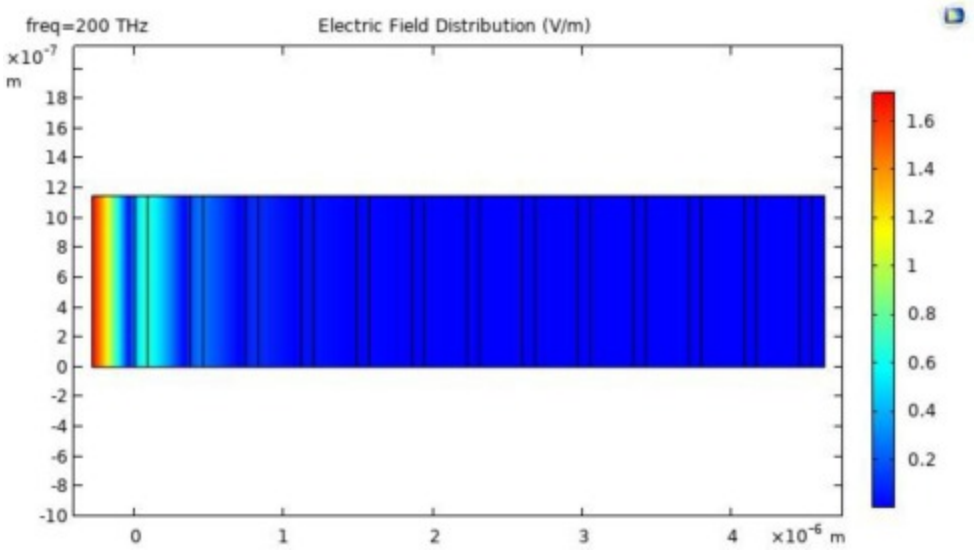

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Fig. 6. Electric field distribution in the 1D PC structure at 200THz.

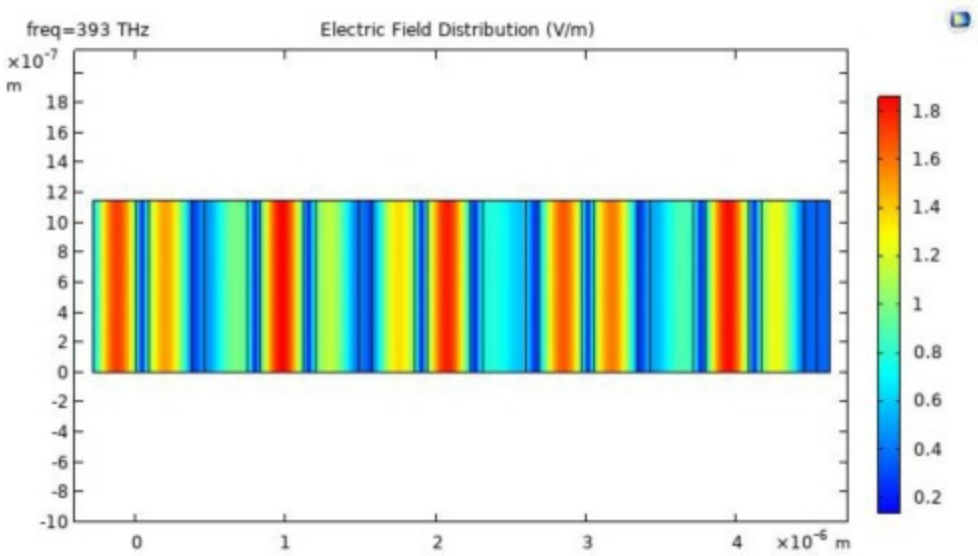

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Fig. 7. Electric field distribution in the 1D PC structure at 393THz.

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The transmission properties of PC structures can be changed with the introduction of defect cavity (Aly and Zaky, 2019, Abd El-Aziz et al., 2019). In this work silicon high-index layer is introduced at the center region which acts as a defect cavity and alters the periodicity of the structure. This allows the propagation of resonant mode through the structure. The geometrical length of this defect layer affects the transmission properties and also sensitivity of the sensor (Aly and Zaky, 2019). Therefore, the geometrical length of the defect cavity has to be carefully chosen to obtain better performance. Initially, the geometrical length of the central defect cavity (l_D) is chosen as 2μm which shows good transmission as compared with the lower cavity lengths. Percentage transmission of light through the structure is observed in the transmission spectrum plot. Influence of cavity defect length on the transmission percentage is observed by changing the cavity length and is plotted as shown in the Fig. 8. The plot obtained concludes that the percentage transmission of light through the structure is a dependent quantity on defect cavity length.

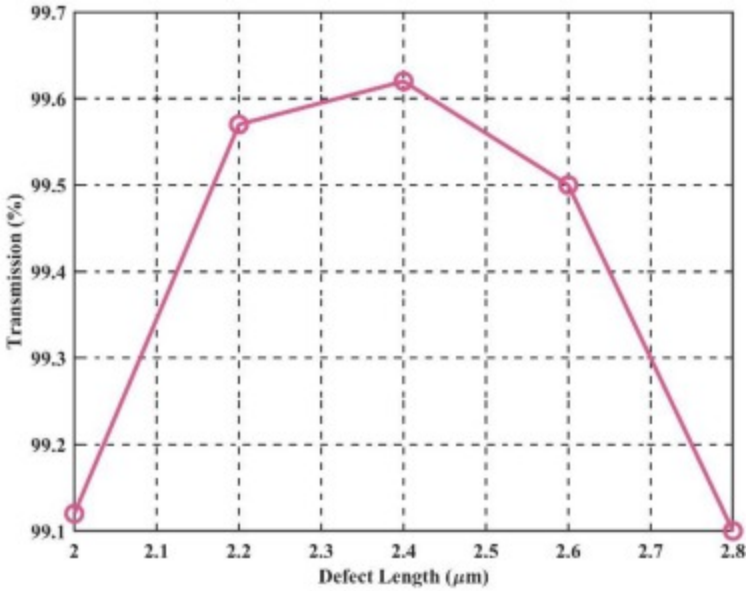

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Fig. 8. Influence of defect cavity length on transmission percentage of the structure.

From the above graph it is clear that, a very high transmission of 99.63% is obtained for a defect cavity length of 2.4μm. Hence, to obtain better light transmission the defect cavity length is chosen as 2.4μm. Sensitivity of the structure is calculated with various applied boundary loads and varying defect cavity length. Normal distribution of the applied boundary load pressure is as shown in the Fig. 9.

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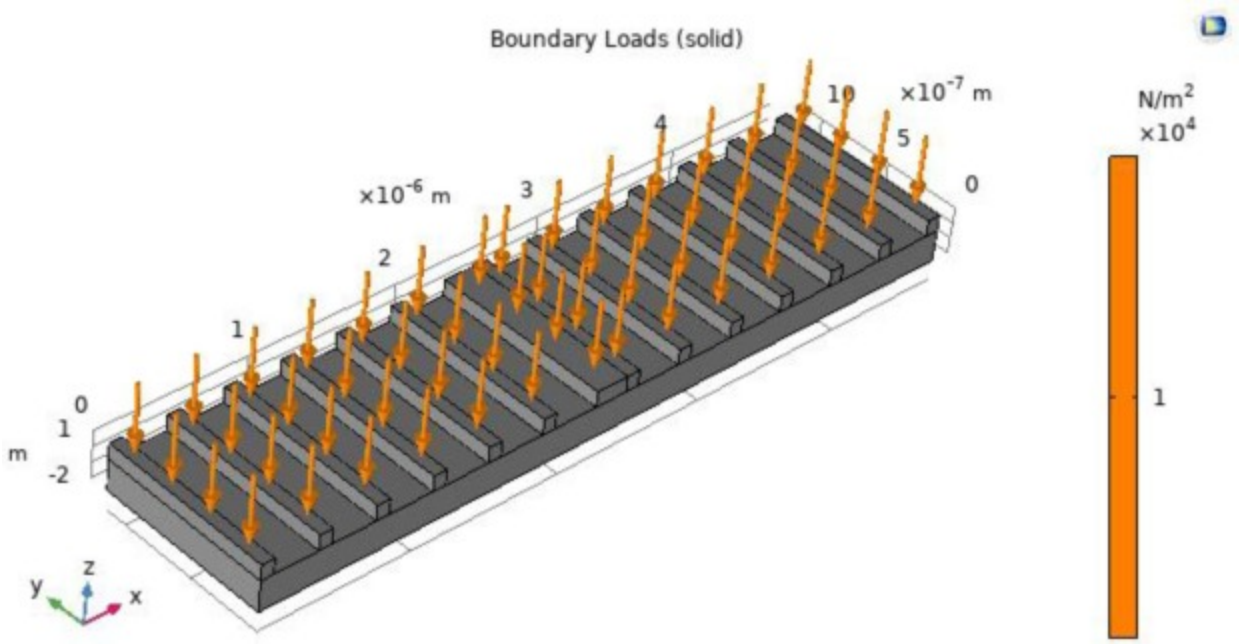

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Fig. 9. Normally distributed boundary load pressure on the 1D PC structure.

Change in RI of the material with the stress induced can be obtained using equation (1). Boundary load pressure is varied from 10kpa to 20kpa to obtain the stress induced on the structure and is tabulated. There is a downward displacement of the PC structure with the applied pressure. If no boundary load is applied, then there is no stress development and the structure has RI of 3.42. The 1D PC structure is designed and simulated using an FEM tool and observed the stress induced. There is an increase in the surface stress with the increase in applied boundary load pressure. The boundary load is varied from 10kpa to 20kpa insteps of 2kpa and the corresponding stress value was recorded. Fig. 10 (a) and (b) shows the deformation of structure with stress developed for the applied boundary load of 10kpa and 20kpa respectively.

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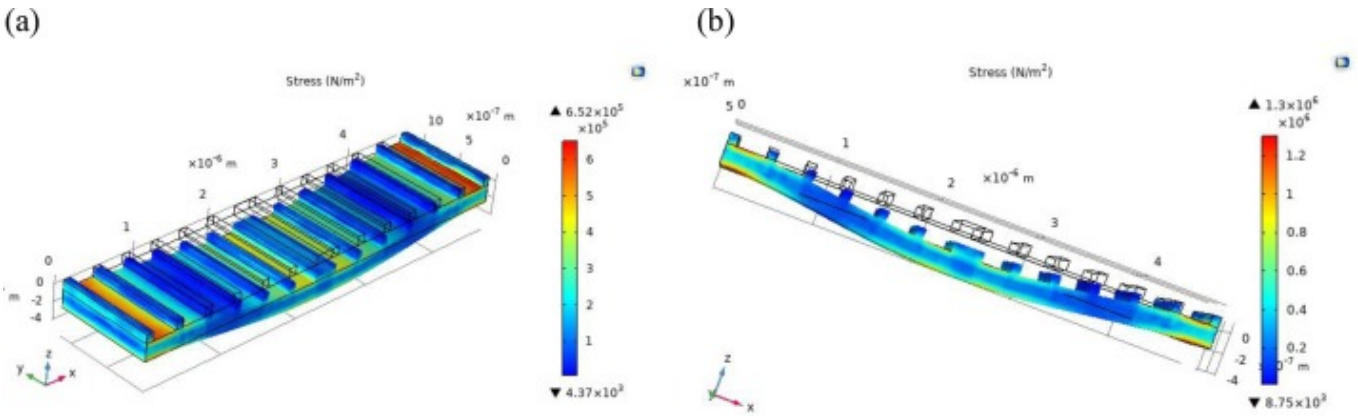

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Fig. 10. 1D PC deformation with the applied pressure of (a) 10kpa and (b) 20kpa.

Induced stress results in structural deformation and this intern alters the RI of the material. The relationship between the applied boundary pressure and corresponding RI change is shown in the Fig. 11.

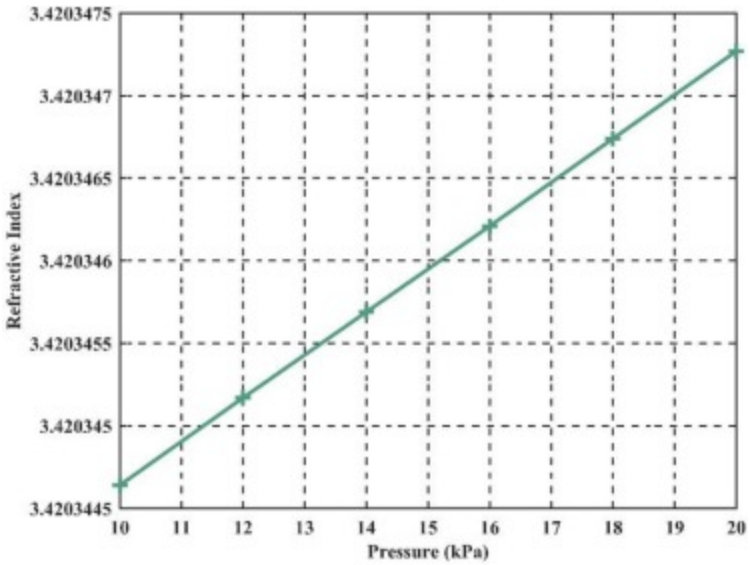

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Fig. 11. Refractive-index variation of silicon sensing layer with the applied pressure.

From the graph it is concluded that there exists a linear relationship between the applied boundary load pressure and the corresponding change in the RI of the material. This RI change can be used as a parameter to sense the applied unknown pressure.

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4.1. Calibrating the defect cavity length

The geometrical length (l_D) of the defect cavity is varied to observe its effect on the transmission spectrum. The physical dimensions of the defect cavity affect the sensing parameters of the sensor (Aly and Zaky, 2019). Fig. 12 represents the variation of transmission percentage with the increase in defect cavity length from 2μm to 2.8μm. It is observed that when cavity length is equal to 2.4μm, then the structure exhibits very high transmission percentage of 99.63%. Hence the cavity is length is chosen as 2.4μm for further analysis.

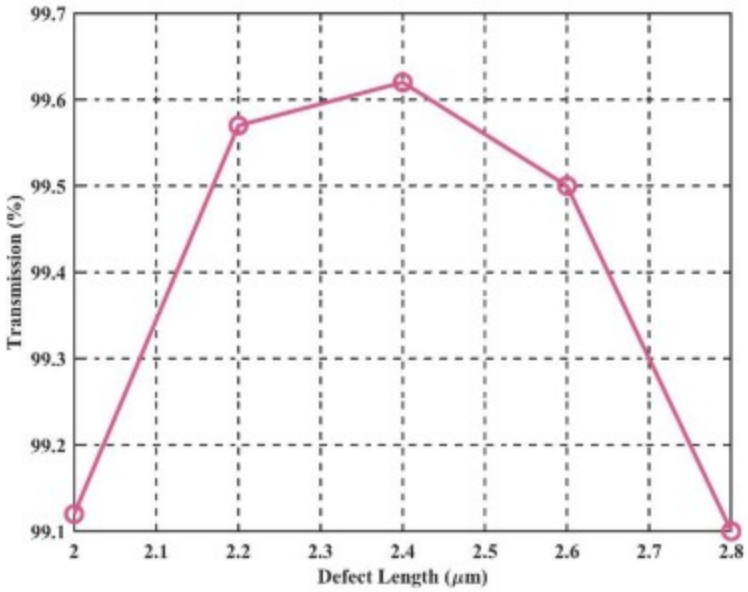

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Fig. 12. Effect of defect cavity length on the transmission percentage.

Ability of the sensor to sense smallest change in the measuring quantity is called sensitivity. Mathematically it is given as change in the wavelength for the corresponding change in applied pressure.

$$S = \frac{\Delta\lambda}{\Delta P}\text{nm / kpa} \quad (3)$$

Sensitivity variation of the structure with the applied boundary load is computed and plotted as shown in the Fig. 13. From the plot it is clear that there is a linear relationship with the applied boundary pressure and sensitivity. A highest sensitivity of 3.5×10^{-7} μm/kpa is obtained for the boundary load of 20kpa.

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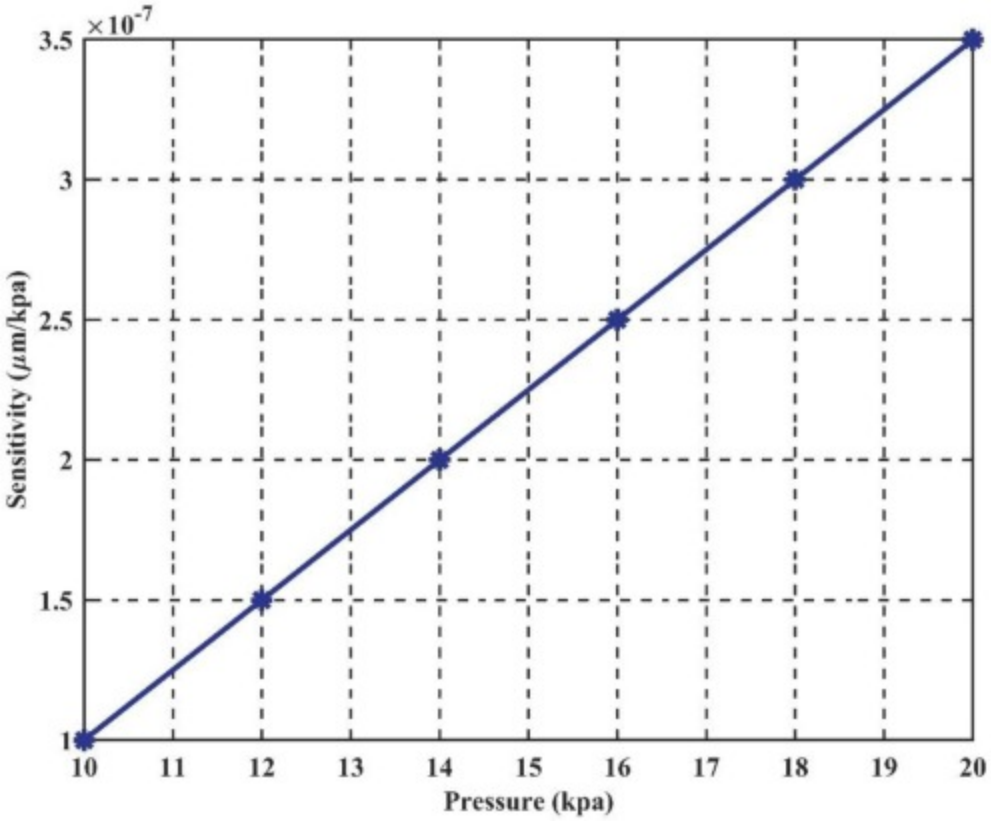

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Fig. 13. Effect of applied pressure on the sensitivity of the structure.

4.2. Calibrating the number of periods

Number of periods (N) is an another significant factor has to be considered while designing the optical sensor (Abd El-Aziz et al., 2019). The Q factor of a sensor indicates the ability of sensor to accurately detect the exact pressure applied. Mathematically it is represented as

$$Q = \frac{\lambda_r}{\text{FWHM}} \tag{4}$$

where, λ_r is the resonant frequency and FWHM represents the width of the resonant mode at its half maximum.

The effect of varying the number periods on FWHM and Q factor is computed and is plotted in Fig. 14, Fig. 15 respectively. The FWHM of the transmission spectrum reduces with the increase in the number of periods on either side of the cavity. This is due to very high confined mirroring action of the light around the cavity. As the number of DBR layers increases, the transmitting light is confined through the cavity over long time and hence the transmission spectrum reduces with

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the increase in the number of periods and this can be clearly observed in the Fig. 14. The Q factor of a sensor is inversely proportional to the FWHM and hence Q factor increases with the reduction in the FWHM. The improvement in Q factor with the increase in the DBR layers can be clearly observed in the Fig. 15. It is clarified from the graph that there is an increase in the Q factor due to reduction in the FWHM with the increase in the number of layers from 2 to 6 and it became constant above this value. Hence the optimum number of periods on either side of the defect cavity is taken as 6 to reduce fabrication complexity which results in very high Q factor of 40,104.

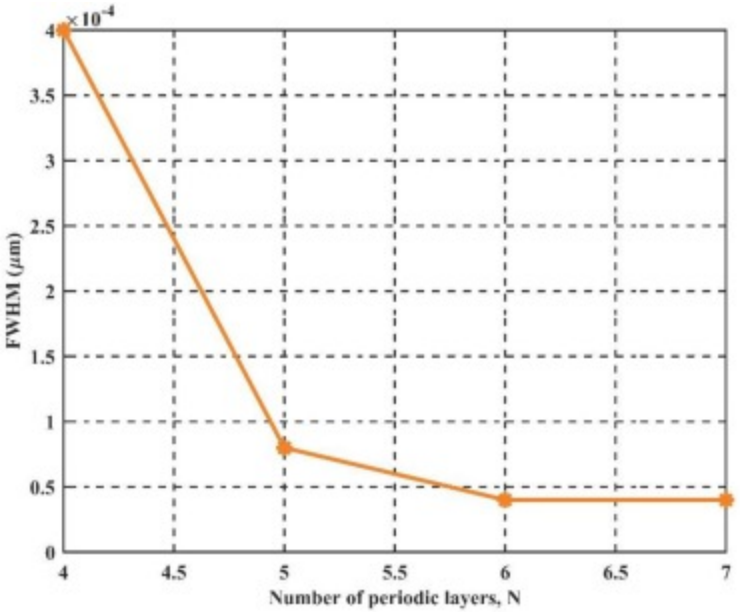

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Fig. 14. Effect of number of periods on the FWHM of the proposed sensor.

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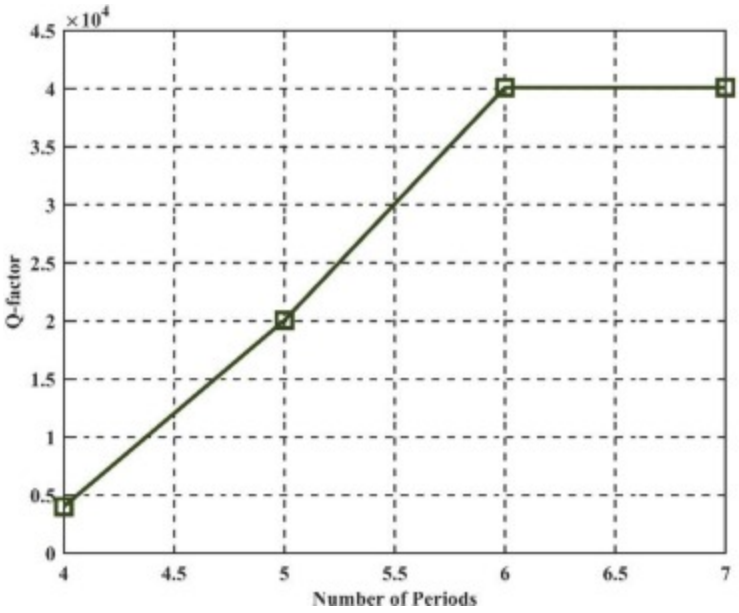

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Fig. 15. Effect of number of periods on the Q factor of the proposed sensor.

Next, the performance of the sensor is evaluated by incorporating the above optimized values of l_D=2.4μm with N=6. The applied pressure is varied from 10kpa to 20kpa with an increment of 2kpa and the corresponding shift in the resonant wavelength of the transmission is observed and is plotted as shown in Fig. 16. The resonant mode peak is observed at 1.6674666μm for 10kpa applied pressure and is shifted to 1.6674691μm for 20kpa. There is a significant shift in the resonant wavelength towards higher wavelength region with the increase in applied pressure. This shift in the resonant peak with applied pressure is plotted in Fig. 17. Wavelength shift can be measured with the optical spectrometer and from this one can determine the applied unknown pressure.

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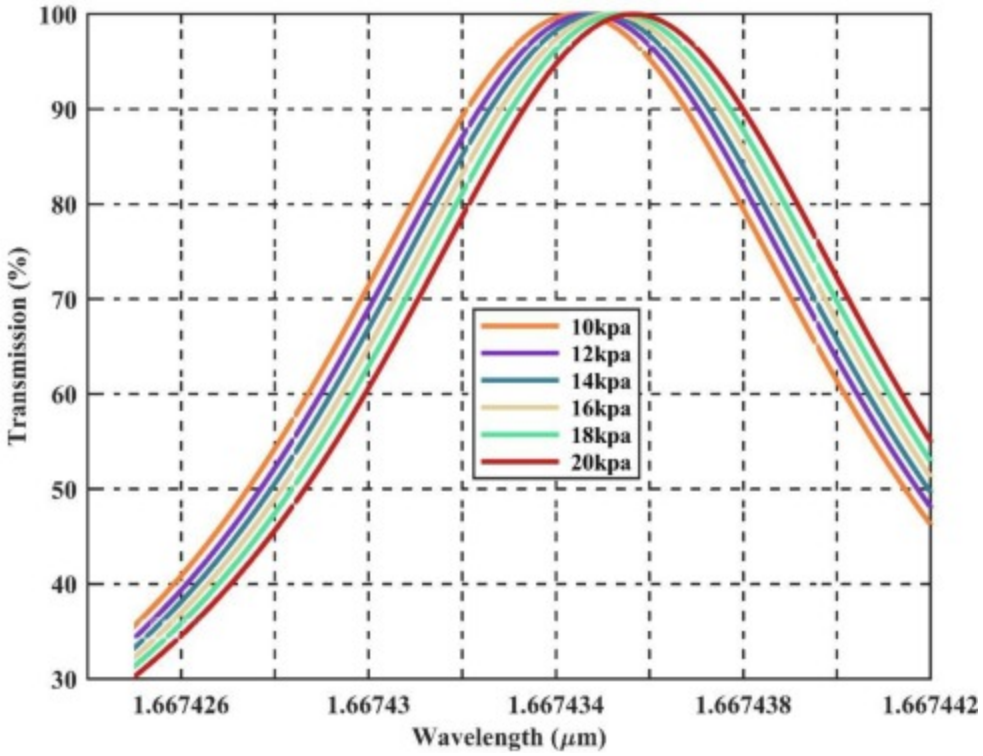

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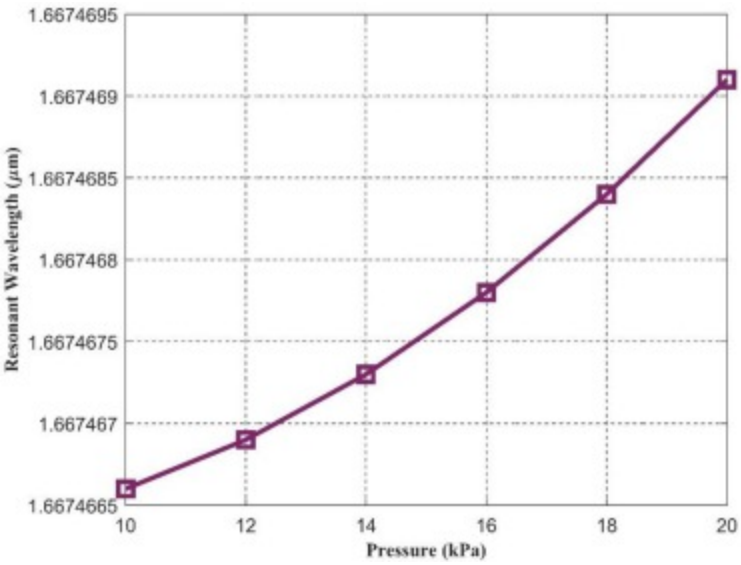
Fig. 16. Wavelength shift of transmission spectrum with the applied pressure from 10kpa to 20kpa.



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gion with the applied pressure from 10kpa to 20kpa.

4.3. Other important sensing parameters

Two other important sensing parameters of an optical sensor are Signal to Noise Ratio (SNR) and Detection Limit (DL). They are defined as follows (Abd El-Aziz et al., 2019, White and Fan, 2008).

The accuracy of the sensor to measure the desired quantity in a noisy environment is determined by ***signal to noise ratio***. This is the permitted change in resonant wavelength in the FWHM range.

$$\mathrm{SNR} = \frac{\Delta\lambda_{\mathrm{res}}}{\Delta\lambda_{1/2}} \tag{5}$$

Detection Limit (DL) measures how well the sensor can pick up even the slightest RI variations. Mathematically,

$$\delta n = \frac{\Delta\lambda_{1/2}}{1.5S(SNR)^{0.25}} \tag{6}$$

where, $\Delta\lambda_{1/2}$ is the FWHM of the resonant wavelength

S is the sensitivity of the sensor

SNR is signal to noise ratio

δn is detection limit

Fig. 18, Fig. 19 shows the variation of SNR and DL for the various applied hydrostatic pressure respectively. The SNR of the sensor increases linearly as the applied pressure is varied from 12kpa to 20kpa in the steps of 2kpa and is plotted in the Fig. 18. This the due the shift in the resonant peak towards higher wavelength region with the increase in the applied boundary load pressure. The proposed sensor shows highest SNR of 0.0177 for the applied boundary load of 20kpa. The variation of detection limit with the applied pressure is plotted in the Fig. 19, which is almost linear with the increase in applied pressure. For the proposed sensor, a very minimum detection limit of 0.167kpa is achieved for the applied boundary load pressure of 12kpa.

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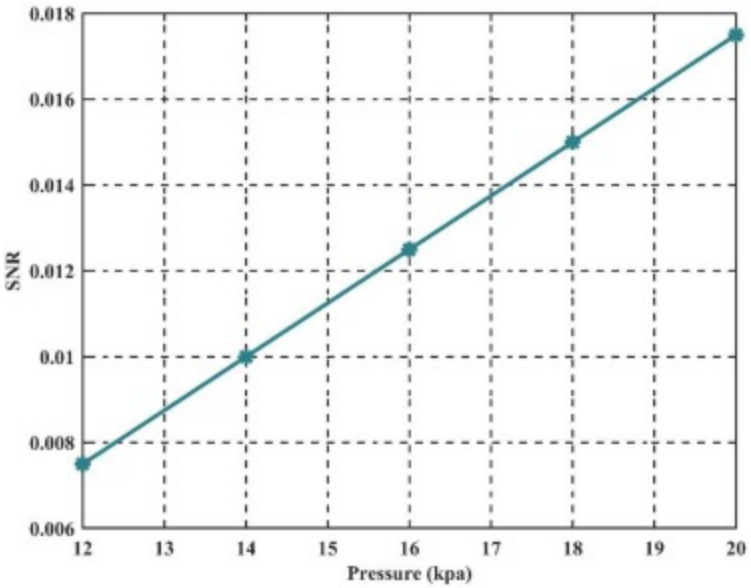

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Fig. 18. SNR of the proposed sensor with the applied pressure from 12kpa to 20kpa.

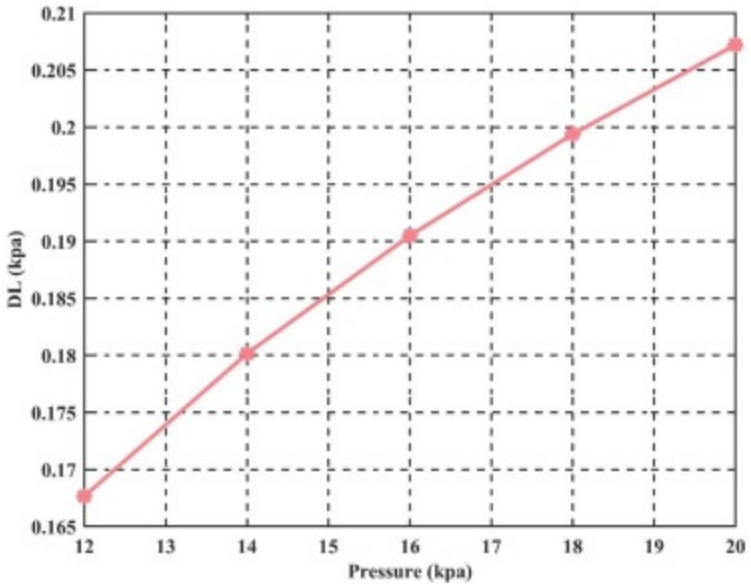

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Fig. 19. Detection limit of the proposed sensor with the applied pressure from 12kpa to 20kpa.

To justify the proposed work for its goodness, the design is compared with the recently reported works in the literature. The tabulated values in the Table 3 shows that there is a significant improvement in the proposed sensor design as compared to the existing designs.

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Table 3. Comparison of the proposed sensor design with the recent works.

Sl. No.	Structure	Sensitivity (nm/GPa)	Reference	Year
1	1D PC of SiO_2-TiO_2 with GaAs defect	8.6	(Ben-Ali et al., 2020)	2020
2	1D PC of superconductor-semiconductor with GaAs defect	104	(Segovia-Chaves and Vinck-Posada, 2019)	2019
3	1D PC of Si-SiO_2 with Polystyrene defect	199	(Elsayed et al., 2021)	2021
4	1D PC of Si-Air with Si defect	350	Proposed work	–

5. Conclusion

A 1D silicon photonic-crystal pressure sensor is designed and analyzed to detect the applied hydrostatic pressure. The sensing principle behind the proposed work is the change in effective refractive-index of the silicon material with the applied pressure. To sense the applied pressure, a silicon (Si) sensing layer is positioned at the top of the device. By applying a boundary load on the sensing layer, the proposed sensor's pressure sensing performance has been investigated. A central cavity defect region allows the propagation of defect mode through the proposed structure. The boundary load pressure is varied from 10kpa to 20kpa in steps of 2kpa and the corresponding wavelength shift is measured to detect the applied boundary load pressure. Cavity length (l_D) and the total number of layers (N) is calibrated to get the optimized sensing performance. The proposed sensor exhibits a very high sensitivity and Q factor of 350nm/GPa and 40,104 respectively. The obtained results are compared with the recently reported works in the literature. From this comparison it is justified that the proposed sensor has better sensing performance and can be a good candidate for low pressure measurement.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data will be made available on request.

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Volume 77, May 2023, 103287

The development of laboratory downscale rail-wheel test rig model with optical sensors

Preeta Sharan [a], Suchandana Mishra [a], Anup M. Upadhyaya [b]

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Highlights

- 1:3 scale laboratory train model.
- Rail track stability, rail-wheel contact stress in laboratory rail test rig.
- Vertical force of wheel to axial strain on the rail measurement using optical sensors.
- Train axle peak detection, rolling contact fatigue analysis using FBG in laboratory train test rig.
- Fiber Bragg grating sensing technology in rail transport.

Abstract

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A Comprehensive Study of LB Technique in Cloud Infrastructure

Survey Article Published: 25 January 2023

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A. Ajil & E. Saravana Kumar

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Abstract

In the recent Web-based knowledge transfer, cloud computing is essential. The real world has been changed into a virtual one as a result of the pandemic scenario. Cloud computing plays a major role for storing and computing data using remote computing infrastructure for day-to-day activities. The primary concern in cloud computing is distributing information technology (IT) resources efficiently to record the user requests in a short duration. Load-balancing (LB) techniques distribute the system's load among its various nodes to maximize resource usage and user satisfaction. It identifies the heavy loaded and lightly loaded IT resources and balances the task among the clusters. Load balancing ensures that each node in the network shortens reaction times, utilizes optimal resource and boosts performance. To upgrade the performance metrics in cloud computing (CC), various categories of LB techniques have been developed. This survey evaluates the

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Multimedia data transfer from IPV4–IPV6 in an optical network by using routing table

Publisher: IEEE

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Dept. of ECE, Oxford College of Engineering, Bangalore, India

Piruthiviraj P ; Sarvotham Prasad R ; Preeta Sharan ; Nagaraj R **All Authors** •••

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Internet Protocol version6 (IPv6) ad-hoc is a conceptual abstract to solve some of the issues of the present IP versions, say Internet Protocol version4 (IPv4). Some of the problems are delay, latency, reliability, error, address exhaustion, testing, resilience etc. The present paper will be dealing with the conversion from a protocol IPv4 to a next generation IPv6 via optical network configured with a routing table where the analysis of the liquidity of data like multimedia data transfer is done. A virtual connection path between server and client systems (as in the enterprise edition of Java - J2EE) is established using TCP (Transmission Control Protocol). The work proposed is allowed to implement networking via optical cables with a cost effective IPv4 migration to IPv6 for the multimedia communication while having a couple of optical converter devices explicitly. During experimental analysis, the tunnelling method of IPv4 to IPv6 conversion established via optical network with a routing table proved to be an easy verification routine. The duration required to ingress the data at the client end was evaluated and the results obtained while downloading an image file(.jpeg), audio file(.mp3) and video file(.mpeg4) are 0.21, 3, and 10 seconds respectively; the same selection of algorithms was also implemented with a streaming through a server at a bit rate of 10 Gbps . The file sizes of the different multimedia data is found to be constant for an image file, an audio file and a video file to be 20 Mb. Hence we have done an experimental analysis if these multimedia data is transferred via a client server configuration in the optical network by making use of our own routing table.

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Pre-current amplifier based transimpedance amplifier for biosensors

Jyoti M. Roogi, Manju Devi

Abstract

In this paper, we present current amplifier based transimpedance amplifier (TIA) for biosensor applications. Proposed design has low-noise, high Transimpedance gain that can be used for low current measurement applications. The current amplifier based TIA is implemented in order to resolve the fabrication issues related to high value feedback resistor. In this design, the input block to TIA is a low amplitude current amplifier. The designed amplifier is implemented in 90 nm complementary metal-oxide semiconductor (CMOS) technology. The design achieves transimpedance gain of 800 kΩ with a bandwidth of 5 kHz and input referred current noise is of 0.152 pA/$\sqrt{HZ}$ for an input of 41 nA bypassed from current amplifier with input of 200 pA.

Keywords

Current amplifier; Fabrication; Noise; Resistor; Transimpedance amplifier

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Improved Surface Plasmon Effect in Ag-based SPR Biosensor with Graphene and WS_2: An Approach Towards Low Cost Urine-Glucose Detection

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Volume 18, pages 2273–2283, (2023) Cite this article

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Archana Yadav, Madhusudan Mishra, Sukanta K. Tripathy, Anil Kumar, O. P. Singh & Preeta Sharan

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Abstract

Gold and silver are the two notable noble metals with wide implications in surface plasmon resonance (SPR) based sensors. Gold possesses a superior SPR phenomenon compared to silver, however, with extremely high costs. To resolve this problem, the current study proposes a new gold–free SPR biosensor design employing silver as the noble metal for efficient detection of blood glucose using urine as the biosample. The proposed design

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Design of optical sensor for cancer prognosis prediction using artificial intelligence

Research Article Published: 11 July 2023

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Ranjeet Kumar Pathak, Sumita Mishra & Preeta Sharan

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Abstract

A key role of the World Health Organisation is improving the proportion of patients with early cancer diagnosis. Due to the high rates of mortality and recurrence, the treatment process requires several months and is very expensive. Over the years, advancements in computer engineering and optical field communication have inspired numerous scholars to use a variety of computational algorithms to analyse and study the accuracy of the illness prognosis. This article discuss on the development of 2D-photonic crystal biosensor for detecting the variation in refractive index of healthy cell and different types of cancer cell. The variation in refractive index of cell is from 1.368 to 1.399. Work also shows how artificial intelligence algorithm can be used for detecting various types of cancer like blood cancer,

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Highly sensitive temperature sensor using one-dimensional Bragg Reflector for biomedical applications

Ranjith B. Gowda ✉, Preeta Sharan and Saara K.

From the journal Biomedical Engineering / Biomedizinische Technik
https://doi.org/10.1515/bmt-2022-0482

Citations 8

Abstract

A theoretical investigation of multi-layer Bragg Reflector (BR) structure to design highly sensitive temperature sensor is proposed to measure the temperature over a wide range. Characteristic-Matrix (CM) mathematical tool is used to design and analyse the proposed temperature sensor. A 1D Distributed Bragg Reflector multi-layer structure is used to design and analyse the sensing characteristics of the proposed sensor. Periodic modulation in the Refractive-Index (RI) of the two materials, high and low, forms DBR multi-layer structure. Germanium and air are used as the two alternate materials of BR for high and low dielectric layers respectively. Parameters of many semiconductor materials, including germanium, varies with temperature. Here we have considered RI variation of germanium with the temperature to model and design the proposed sensor. A defect layer is introduced at the center of multi-layer structure to obtain the resonating mode for an incident electromagnetic wave. The sensor can detect temperature over a wide range from 100 to 550 K. A resonating mode, shifting towards different wavelength region is observed for the temperature variations. The influence of increase in the DBR layers (N) and defect cavity geometrical length (l_D) is studied. The obtained results conclude that the cavity defect length and BR layers affects the sensing parameters of the designed sensor. The obtained RI sensitivity, Q-factor, temperature sensitivity and detection limit of the sensor are 2.323 μm/RIU, 115,000, 1.18 nm/K and 9.024×10^{-6} RIU respectively. Theoretically obtained transmission spectrum was validated using Monte Carlo simulation.

Keywords: 1D photonic crystal; Bragg Reflector; characteristic matrix; multi-layer structure; refractive index; temperature sensor

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N×N Clos Digital Cross-Connect Switch Using Quantum Dot Cellular Automata (QCA)

Amita Asthana[1,*], Anil Kumar[1], Preeta Sharan[2]

1 Amity University, Lucknow, 226028, India

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ABSTRACT
Today, usages of smart phones by people have increased rapidly and hence, a smart phone can be used efficiently for personal security or various other protection purposes. The heinous incident that outraged the entire nation has wakened us to go for the safety measures and so the hosts of new apps have been developed to provide security systems to women via their phones. This paper presents women security through an Android Application for the Safety of Women and this app can be activated independently by the mobile, whenever the need arises. This app identifies the user location through GPS and sends a message using GCM comprising the current location URL to the registered and emergency contacts and also sends messages to nearby mobile users who are having this app for rescuing purpose in case of danger. This is implemented with hardware using microcontroller, GCM, GPS, buzzer and sensors.
Keywords: smart phones, nation, android, buzzer, sensors

1.Introduction

The ladies in India standing in public places are facing several challenges to face over the past few thousand years. From equal standing with men in past through the low points of the medieval period to the self-promotion of equal rights by several reformers, the history of ladies in India has been eventful. A smart intelligent system is developed to solve the problems faced by women using a wrist band and spectacles used in daily life. It resembles a band incorporated with pressure switch as input which on activation provides a screaming alarm and tear gas mechanism for self defending and provides message to contacts through live video captured using the spectacles[1]. On clicking the app it identifies the location using GPS and sends message to the registered contacts every 5 minutes until the stop button is clicked. This SMS helps to find the location of the victim to be rescued safely [2]. In this system arduino is used for analysis of physiological signal with body position using the sensor such as vibration sensor and fault detection sensor. The acquisition of raw data makes arduino to function by activating GPS to send alert messages through GSM and wireless camera to capture images and video and shared to the registered contacts[3]. The ARM controller and android application are the devices connected to smart phones and are synchronized using Bluetooth which can be triggered independently[4]. In smart women safety system depicts a GPS and GSM zapper circuit based ladies security framework which gives a mix of GPS gadget particular to track the area and gives an alarms and messages a crisis circumstance [6]. Radio frequency based tracking is for helping parents to keep an eye on the women is everywhere they are. Many methods can be used to design various form of RFID which results in accurate information and better performance in power and image reading [7]. When someone going to harass she can just press button and location is sent to an SMS alert to few predefined numbers in terms of latitude and longitude[8]. The women safety device allows immediate response and focuses on providing instant protection to user by alarming sound using buzzer and the shock is protected by the shocker circuit through relay[9]. The crime against women can be brought to an end with the real time system implementation. This system helps to supports the gender equality by providing safe environment to women in the society, and allows them to work till late nights. The proposed system provides tool for intrusion detection inside the home where senior citizen, handicapped person leaving alone and after detection it takes necessary preventive measure [10]. It can be overcome by storing data onto the cloud.

2.Methodology

Bragg reflector one-dimensional multi-layer structure sensor for the detection of thyroid cancer cells

Ranjeet Kumar Pathak, Sumita Mishra, Preeta Sharan

Abstract

In the proposed work, a defect cavity multi-layer Bragg reflector structure is proposed theoretically to find the presence of thyroid cancer cells in the given sample. The modelling, design and analysis of the sensor is performed using characteristic matrix method (CMM). Proposed structure has central defect cavity with 6 pairs of low and high refractive index layers on each side of the defect. To enhances the sensor sensitivity, the incident light in mid-infrared frequency range is used as input light source. The refractive index of normal and thyroid cancer cells is analysed for the performance of the sensor. The obtained Q factor and sensitivity of the sensor design is 3729 and 2828 nm/RIU respectively. The proposed sensor is a best choice of optical sensor for the detection of thyroid cancer cells in the given test sample for accurate analysis in medical applications.

Keywords

Bragg's reflector; characteristic matrix method; micro-cavity; photonic crystal; thyroid cancerous cells;

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Comparative analysis and design of high-performance photonic crystal add–drop filter for optical switching

Research Article Published: 08 November 2022

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Amita Asthana, Anil Kumar & Preeta Sharan

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Abstract

Photonic crystal add–drop filter structures are promising technology for optical communication networks. This paper presents the design of H-shaped photonic crystal add–drop filter that consists of one straight waveguide and four arm waveguides. A ring resonator-based add–drop filter has been proposed with upper and lower waveguides for light propagation. A triangular-shaped add–drop filter has also been designed using two-dimensional photonic crystals (2D-PCs) also with high optical transmission capabilities. Numerical methods such as plane wave expansion and finite-difference time-domain

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Two-Dimensional Photonic Crystal Biosensor Based on Gallium Arsenide Composite Semi-conductive Material for Diabetes Detection

RESEARCH Published: 08 May 2023

Volume 18, pages 1429–1440, (2023) Cite this article

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Manjunatha N, Sarika Raga, Sanjay Kumar Gowre, Hameed Miyan & Preeta Sharan

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Abstract

In this study, a gallium arsenide (GaAs) composite semi-conductive material is used as rods with an air background lattice point as a photonic crystal for the detection of diabetes using urine, blood, and tear samples. The refractive index (RI) of bio-samples at various concentrations is used to determine the interaction between light and analyte. As a result, there is a good wavelength shift and light confinement in the detecting region. The photonic bandgap (PBG) and optical characteristics of light are measured using the plane wave expansion (PWE) and finite difference time domain (FDTD) techniques, respectively. The

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Numerical modelling of 1-dimensional silicon photonic crystal sensor for hydrostatic pressure measurement

Ranjith B. Gowda, Preeta Sharan and Saara Khamar

From the journal Zeitschrift für Naturforschung A
https://doi.org/10.1515/zna-2022-0261

Citations 11

Abstract

In this work, a highly sensitive hydrostatic pressure sensor using one-dimensional (1D) photonic-crystal (PC) is designed and analyzed numerically for its sensing performance. The device design has silicon (Si) sensing layer at the top to sense the applied pressure. The proposed sensor performance has been studied for its pressure sensing, by applying boundary load on the sensing layer. The structure is designed, simulated and analyzed using an FEM tool. As the applied pressure is varied from 0 MPa to 10 MPa, resonant mode shifts towards the higher wavelength region. The effect of defect cavity length and the number of periods are also analyzed to choose the optimized value which enhances the sensor performance parameters. Simulation result shows that the proposed sensor has a very high sensitivity of 250 nm/GPa and Q-factor of 11,120 with the transmission of 99.99%.

Keywords: FEM; multi-layer structure; photonic crystal; pressure sensor; transfer matrix

Corresponding author: Preeta Sharan, Department of Electronics & Communication Engineering, The Oxford College of Engineering, Bangalore, India, E-mail: sharanpreeta@gmail.com

Author contributions: All the authors have accepted responsibility for the entire content of this submitted manuscript and approved submission.

Research funding: None declared.

Conflict of interest statement: The authors declare no conflicts of interest regarding this article.

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Design of Two-Dimensional Photonic Crystal Defect Microcavity Sensor for Biosensing Application

Research Published: 13 April 2023

Volume 15, pages 5503–5511, (2023) Cite this article

Silicon

Aims and scope

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Preeta Sharan, Tahani A. Alrebdi, Abdullah Alodhayb & Anup M. Upadhyaya

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Abstract

In the proposed work we designed and analysed a two-dimensional photonic crystal based sensor for three different biosensing applications, including measuring the normal and abnormal levels of uric acid, glucose, and creatinine in the blood. We examine the sensitivity, Q factor, and wavelength shift of two different types of sensor cavity design. The simulation approach used a finite difference time domain method. The work has made use of electromagnetic equation propagation, MEEP tool from the Massachusetts Institute of Technology. The maximum sensitivity of the proposed sensor is 282 nm/RIU and Q factor of

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Highly Sensitive Bimetallic-Metal Nitride SPR Biosensor for Urine Glucose Detection

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The present study introduces a highly sensitive bimetallic SPR biosensor based on metal nitride for efficient urine glucose detection. Using a BK-7 prism, Au (25 nm), Ag (25nm), AlN (15 nm), and a biosample (urine) layer, the proposed sensor comprises of five layers. The selection of the sequence and dimensions of both metal layers is based on their performance in a number of case studies including both monometallic and bimetallic layers. After optimizing the bimetallic layer as Au (25 nm) – Ag (25 nm), various nitride layers were used to further increase the sensitivity by utilizing the synergistic effect of the bimetallic and metal nitride layers through case studies of several urine samples, ranging from nondiabetic to severely diabetic patients. AlN is determined to be the best suited material, and its thickness is optimized to 15 nanometers. The performance of the structure has been evaluated using a visible wavelength, i.e., $\lambda = 633$ nm, in order to increase sensitivity while providing room for low-cost prototyping. With the layer parameters optimized, a significant sensitivity of 411°/RIU (Refractive Index Unit) and figure of merit (FoM) 105.38 /RIU has been achieved. The computed resolution of the proposed sensor is 4.17e-06. This study's findings have also been compared to some recently reported results. The proposed structure would be useful for detecting glucose concentrations, with a rapid response as measured by a substantial shift in resonance angle in SPR curves.

Published in: IEEE Transactions on NanoBioscience (Volume: 22 , Issue: 4, October 2023)

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Front. Mater., 11 January 2023

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Volume 9 - 2022 |

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Effect of 2-D nanomaterials on sensitivity of plasmonic biosensor for efficient urine glucose detection

Updated

Archana Yadav[1] Shatrughna Kumar[2]*

Anil Kumar[1] Preeta Sharan[3]

[1] Department of ECE, Amity School of Engineering and Technology, Amity University, Uttar Pradesh Noida Lucknow Campus, Noida, India

[2] Department of Physical Electronics, School of Electrical

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Srujana Ramachandra, M. V. Panduranga Rao & Preeta Sharan

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Abstract

This study ponders the prospect of a Plasmon enabled optical memory device to achieve higher data transfer rates and data density. The device is based upon Silicon as a substrate, Silver metal and Silicon nitride sandwiched between them. Paper discusses simulation based excitation analysis of two design variations of a memory device labelled device 1 and device 2, focusing upon the metal layer containing Nano aperture, with an area of 250 nm^2 using 650 nm light source. Simulations are carried out with the help of opti-FDTD and Rsoft

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Abstract

Quantum Dot Cellular Automata (QCA) technology is gaining popularity for its low power requirements, high speed and efficient miniaturization of digital circuits. Especially, digital circuits now need to be realized and investigated at quantum levels. The manuscript presents the design of several combinational and sequential logic circuits by employing reversible quantum gates such as Peres gate, Thapliyal Ranganathan (TR) gate and Feynman gate (FG) using QCA technology. The manuscript presents the novel design of various latches

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PAPER

Optofluidic photonic crystal micro sensor for enhanced detection of infectious diseases

Preeta Sharan[6], Ghada A Khouqeer, Basma A El-Badry, Abdullah N Alodhayb, Anup M Upadhyaya and Harshada J Patil

Published 28 December 2023 • © 2023 IOP Publishing Ltd

Engineering Research Express, Volume 6, Number 1

Citation Preeta Sharan *et al* 2024 *Eng. Res. Express* **6** 015012

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Archana Yadav, Madhusudan Mishra, Sukanta K. Tripathy, Anil Kumar, O. P. Singh & Preeta Sharan

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Gold and silver are the two notable noble metals with wide implications in surface plasmon resonance (SPR) based sensors. Gold possesses a superior SPR phenomenon compared to silver, however, with extremely high costs. To resolve this problem, the current study proposes a new gold–free SPR biosensor design employing silver as the noble metal for efficient detection of blood glucose using urine as the biosample. The proposed design

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Research Article Published: 18 November 2023

Volume 53, pages 2460–2468, (2024) Cite this article

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Aims and scope

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Deepa Nagaraju, Preeta Sharan, Sneha Sharma & Srijani Chakraborty

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Abstract

The Indian railway traffic is increasing and is expected to increase more in the future, thus making safety a critical issue to focus on. However, there is very little work on smart monitoring with respect to railway infrastructure in India. This paper analyses this problem and proposes an optical sensor-based smart monitoring solution for railways. A fibre Bragg grating-based sensor is deployed on the sleeper of a lab train model, and an effective algorithm is proposed to successfully detect the train speed and the axle count using the sensor data. The train speed and axle count are fundamentals in the process of detecting railway faults such as derailments, wheel flats and corrugation or unbalanced loads. For a moving train, the instantaneous train speed is not readily available for monitoring purposes

CORRECTION article

Front. Mater., 14 November 2023

Sec. Semiconducting Materials and Devices

Volume 10 - 2023 |

https://doi.org/10.3389/fmats.2023.1333014

Corrigendum: Effect of 2-D nanomaterials on sensitivity of plasmonic biosensor for efficient urine glucose detection

Archana Yadav[1]

Shatrughna Kumar[2]*

Anil Kumar[1]

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Measurement model of integrated FBG sensor for beam structure

Research Article Published: 20 October 2023

Volume 53, pages 2355–2360, (2024) Cite this article

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Somesh Nandi, K. Chethana, T. Srinivas & Preeta Sharan

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Abstract

Fibre Bragg grating sensors are investigated in various structural health monitoring systems. Most of these research used a variety of FBG sensors to assess the structures' temperature and strain. The FBG sensor is combined with two fixed and cantilever beam structures in the proposed study. A wide range of pressure and temperature are considered during the analysis. In different circumstances, the range of wavelength shift obtained has been evaluated. In mathematical modelling, the definition of the correlation between variables has been taken into consideration using linear regression approaches. The fixed beam model demonstrated good agreement with a *R*-squared score of 96%. For a cantilever beam, *R* squared was 88%. The obtained wavelength range of the cantilever beam is larger, ranging from 1.552 to 1.566 nm. Proposed work will enable more precise

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Two-Dimensional Photonic Crystal Biosensor Based on Gallium Arsenide Composite Semi-conductive Material for Diabetes Detection

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Abstract

In this study, a gallium arsenide (GaAs) composite semi-conductive material is used as rods with an air background lattice point as a photonic crystal for the detection of diabetes using urine, blood, and tear samples. The refractive index (RI) of bio-samples at various concentrations is used to determine the interaction between light and analyte. As a result, there is a good wavelength shift and light confinement in the detecting region. The photonic bandgap (PBG) and optical characteristics of light are measured using the plane wave expansion (PWE) and finite difference time domain (FDTD) techniques, respectively. The effect of varying the radii of the biosensor's sensing rod is studied. The biosensor performance parameters obtained were a sensitivity of 821 nm/RIU, Q-factor of 16,209.680, low detection limit of 1.587×10^{-4} RIU, high figure of merit of 6300.683 RIU^{-1},

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Abstract

In the proposed work we designed and analysed a two-dimensional photonic crystal based sensor for three different biosensing applications, including measuring the normal and abnormal levels of uric acid, glucose, and creatinine in the blood. We examine the sensitivity, Q factor, and wavelength shift of two different types of sensor cavity design. The simulation approach used a finite difference time domain method. The work has made use of electromagnetic equation propagation, MEEP tool from the Massachusetts Institute of Technology. The maximum sensitivity of the proposed sensor is 282 nm/RIU and Q factor of

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Abstract

Photonic crystal add–drop filter structures are promising technology for optical communication networks. This paper presents the design of H-shaped photonic crystal add–drop filter that consists of one straight waveguide and four arm waveguides. A ring resonator-based add–drop filter has been proposed with upper and lower waveguides for light propagation. A triangular-shaped add–drop filter has also been designed using two-dimensional photonic crystals (2D-PCs) also with high optical transmission capabilities. Numerical methods such as plane wave expansion and finite-difference time-domain

Early Detection of The Glaucoma and Other Intra-Ocular Pressure Elevation Diseases Using Hardware Efficient Machine Learning Approach

Author(s)	P. Suresh Venugopal, K. Remya Bharathy, Ravindrakumar Selvaraj
Country	India
Abstract	Nowadays, Glaucoma is one of the chronical diseases that entirely make the human eyes into the blindness. This disease is a consequence of an accumulation of aqueous humor in the eye due to a defect of its drainage system. This condition progressively elevates the intra-ocular pressure (IOP), affecting the optic nerve and resulting in permanent blindness if left untreated. In early stages, the glaucoma may be an asymptomatic. Hence, the proposed method is designed to detect the early stage of the glaucoma. This can be done by measuring the cup to disk ratio. For that, the proposed image processing algorithm is constrained with the three basic steps such as preprocessing, feature extraction and classification. In classification stage, we employ the SVM classifier to classify the normal and glaucoma images. The method is found to be efficient in hardware implementation when compared to other methods. The overall implementation will be held in the Matlab supporting environment.
Keywords	Glaucoma, SVM, Intraocular pressure, machine learning,
Field	Computer > Artificial Intelligence / Simulation / Virtual Reality
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Published On	2023-09-22
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G.RAMKUMAR

Arul Anandar College, Karumathur, Madurai, Tamilnadu, India.

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Implementation Of Smart Energy Meter With Power Management Using Low Power
2. Embedded Controller

Umayal Muthu.V, Dr.A. Shunmugalatha, Kowsika.B

VCET, Madurai

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3. Mathematics On Agriculture; Plant Science And Number System

R. BHAVANI, P.NIVETHA

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Advances and Challenges in Science and Technology

Vol. 9

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Comparison of Face Recognition Using PCLDA and Neural Network

V. Vijaya Kumari

Advances and Challenges in Science and Technology Vol. 9, 30 November 2023, Page 139-152
https://doi.org/10.9734/bpi/acst/v9/6966C (https://doi.org/10.9734/bpi/acst/v9/6966C)
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Abstract

Facial recognition is a complex multidimensional structure that demands sophisticated computing techniques for authentication purpose. In this paper, we introduce the Integral Normalized Gradient Image (INGI) algorithm with various normalizing stages. The system comprises a novel illumination insensitive preprocessing method, a hybrid Fourier based feature extraction and matching process. The Pre-processing method is grounded in the analysis of the facial imaging model, considering intrinsic and extrinsic factors of the human face. Feature extraction encompasses hybrid Fourier features extracted from different frequency bands and multiple face models. By deriving Fourier features from three Fourier domains and three distinct frequency bandwidths, we acquired additional complementary features. These features are individually classified using Principal Component and Linear Discriminant Analysis (PCLDA). This approach enables in analyzing a face image from the various viewpoints for identity recognition. Furthermore, we propose multiple face models based on different eye positions with a same image size. This contributes significantly to enhancing the performance of the proposed system. Recognition is achieved through Euclidean Distance and Neural Network based classifier, resulting in a recognition accuracy of approximately 89.23% for the Euclidean Distance classifier-based model and 93.40% for Back Propagation Neural Network Classifier.

- 대한전자공학회
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- IEIE Transactions on Smart Processing & Computing Vol.12 No.1
- 2023.2 1 - 8 (8page)
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저자정보

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초록·키워드

오류제보하기
In this paper, we propose a blind image deblurring algorithm using block-augmented Lagrangian and low-rank priors (BALLORG) as a non-learning method that can give better results without the complexity of learning-based methods. The proposed algorithm achieves faster convergence within 20 iterations than conventional methods. Regularization priors are used in the form of gradients and sparse low-rank matrices, and recursive rank improvements result in better deblurring performance. The steepest descent in minimization is maintained through weight selection for penalty and regularization parameters. The block processing introduces local and global optimization, leading to better visual quality outputs. The proposed method has excellent performance in terms of the PSNR, SSIM, and FSIM matrix, which is on par with or better than that of other state-of-the-art learning and non-learning-based approaches.

#Image restoration #BALLORG #Low-rank Prior #Augmented Lagrangian #Penalty methods #Lagrangian multipliers #Derivative prior #Block sparsity #Ill posed optimization #Constrained optimization

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2. Related Work
3. The Proposed Scheme
4. Experimental Results
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H. Zheng, "A Survey on Single Image Deblurring," 2021 2nd International Conference on Computing and Data Science (CDS), 2021, pp. 448-452, Article(CrossRef Link) M. El Helou and S. Süsstrunk, "Blind Universal Bayesian Image Denoising With Gaussian Noise Level Learning," IEEE Transactions on Image Processing, vol. 29, pp. 4885-4897, 2020, Article(CrossRef Link) V. Maik, Dohee Cho, Jeongho Shin, and

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Engineering Failure Analysis

Volume 138, August 2022, 106376

Real time implementation of fiber Bragg grating sensor in monitoring flat wheel detection for railways

Suchandana Mishra [a], Preeta Sharan [b], K. Saara [a]

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Highlights

- Rail-wheel analysis of the train.
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- Positions of grating sensors installed on the rail.
- Time domain and frequency spectrum analysis for the strain data induced on the rail when train passes by, to detect wheel flats.
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THD minimization of ZVT -ZCT Quasi Resonant SEPIC Converter with proposed Harris Hawks Optimization Technique

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In this paper ZVT (Zero Voltage Transition)-ZCT (Zero Current Transition) based Quasi Resonant SEPIC (QRSEPIC) converter with a Voltage Source inverter (VSI) using optimization algorithm is proposed. The proposed converter uses solar energy as its input, which is a sustainable form of energy. In this paper special attention is paid to pulse width modulation (PWM) techniques, which aim to reduce the harmonic content. The harmonics are controlled due to the switching techniques. Rigorous work has been done for the reduction of harmonic content with various algorithms and optimization technique. This paper suggests optimization control technique to generate the PWM pulses, based on Harris Hawks Optimization algorithm to minimize the objective function. For this switching control of the proposed QRSEPIC converter, the system performance is improved, and Harmonic distortion is controlled. Further computation is done for the enhancement of efficiency. Simulation studies were carried out with MATLAB/Simulink for photovoltaic systems, and it was observed that the QRSEPIC with Harris Hawks algorithm gave better results compared to other optimization methods. The proposed method achieves an efficiency of 99.01 percentage and the reduction in THD to 0.832 percentage.

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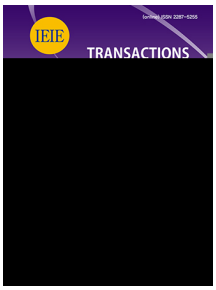

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초록·키워드

오류제보하기
Solar energy has emerged as a growing source of alternative electrical energy in the new century because of the reliability, improvements, and efficiency in photovoltaic (PV) systems. In a PV system, maximum power point tracking (MPPT) is a significant feature because a set of conditions in PV system power is maximized, and thereby, array efficiency increases. In this article, a quasi-resonant Cuk-converter (QRCC)-based voltage source inverter (VSI) is proposed for application to large-scale photovoltaic generators. The quasi-resonant Cuk converter is built on zero voltage transition (ZVT) and zero current transition (ZCT) strategies, designing an optimization technique based on a VSI that eliminates harmonics. Through simulation related to MPPT controllers, the QRCC is achieved, feeding the load through the VSI to minimize harmonics. The results show that the proposed VSI, based on Harris hawks optimization, reduces network harmonics, and those results are compared to the quasi-resonant single-ended primary inductance converter (QRSEPIC).

전체보기

#Quasi-resonant cuk converter #Photovoltaic (PV) #Voltage source inverter #Harris hawks optimization #Grid

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Grid connected PV based on quasi resonant zeta converter with Harris Hawk optimization algorithm for the implementation of PI controller

Original Research Published: 24 November 2023

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Abstract

In this paper the proposed Quasi Resonant Zeta converter is used to reduce the switching losses. Here Input of the converter is connected to the Photovoltaic (PV). The main aim of this paper is to reduce the converter switching losses and grid side harmonics. Here the Maximum Power Point Tracking (MPPT) is used to control the Quasi resonant converter, ZVT (Zero voltage Transition) and ZCT (Zero Current Transition) are applied to the converter.

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Abstract

Current CMOS (Complementary metal–oxide–semiconductor) technology is no longer constrained in scaling by short channel effects. The semiconductor industry has developed a number of substitute technologies, including quantum-dot cellular automata, to get around these restrictions (QCA). In this study, a novel technique for developing digital differentiators and integrators is presented, employing QCA Technology as a key component. In order to design the digital differentiator focus has been given on no recursive simple tapped delay line differentiator called first difference differentiator and central

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ABSTRACT

The current investigation's objective was to assess the air jet erosion tester's ability to measure the erosive behaviour of plasma sprayed coatings on titanium-15 alloy. 65% NiCrAlY, 30% Cr_2O_3, and 5% YSZ make up the coating's chemical composition. A study of microstructure and phases was carried out. Microhardness and adhesive strength have both been measured in this work. With impact angles of 30° and 90° at 300°C, 500°C, and 700°C, Al_2O_3 erodent was utilised in a solid particle erosion test. An optical

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Investigation of High-Temperature Erosion Behavior of NiCrAlY/TiO_2 Plasma Coatings on Titanium Substrate

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Abstract

The current study examines the erosive behaviour of a 65% NiCrAlY + 35% TiO_2 plasma-sprayed coating on titanium-15 substrate at various temperatures. X-ray diffraction and scanning electron microscopy were used to characterize the coating. We assessed the coating's porosity, microhardness, surface abrasiveness, and adhesive power. At impact angles of 30° and 90°, solid particle erosion studies were conducted at various temperatures of 300°C, 500°C, and 700°C. The Al_2O_3 erodent was used in the hot air jet erosion tester to

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Design of Two-Dimensional Photonic Crystal Defect Microcavity Sensor for Biosensing Application

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Preeta Sharan, Tahani A. Alrebdi, Abdullah Alodhayb & Anup M. Upadhyaya

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In the proposed work we designed and analysed a two-dimensional photonic crystal based sensor for three different biosensing applications, including measuring the normal and abnormal levels of uric acid, glucose, and creatinine in the blood. We examine the sensitivity, Q factor, and wavelength shift of two different types of sensor cavity design. The simulation approach used a finite difference time domain method. The work has made use of electromagnetic equation propagation, MEEP tool from the Massachusetts Institute of Technology. The maximum sensitivity of the proposed sensor is 282 nm/RIU and Q factor of

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Microstructure, mechanical and wear properties of SiC and Mo reinforced NiCr microwave cladding

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ABSTRACT

The NiCrMoSiC composite cladding on Titan-31 base alloy was produced using a hybrid microwave heating process. The produced claddings were examined for microstructural, phase analysis, microhardness, and surface roughness using suitable techniques. The linear reciprocator ball on plate wear test was conducted using a static alumina indenter on microwave cladding. Studies have been done on track specifications for friction and

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G. M. S. Reddy, **C. D. Prasad**, P. Patil, G. Shetty, N. Kakur & M. R. Ramesh

Pages 245-251 | Received 11 Nov 2022, Accepted 08 Mar 2023, Published online: 02 Jun 2023

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ABSTRACT

The current investigation's objective was to assess the air jet erosion tester's ability to measure the erosive behaviour of plasma sprayed coatings on titanium-15 alloy. 65% NiCrAlY, 30% Cr_2O_3, and 5% YSZ make up the coating's chemical composition. A study of microstructure and phases was carried out. Microhardness and adhesive strength have both been measured in this work. With impact angles of 30° and 90° at 300°C, 500°C, and 700°C, Al_2O_3 erodent was utilised in a solid particle erosion test. An optical

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PAPER

Optofluidic photonic crystal micro sensor for enhanced detection of infectious diseases

Preeta Sharan[6], Ghada A Khouqeer, Basma A El-Badry, Abdullah N Alodhayb, Anup M Upadhyaya and Harshada J Patil

Published 28 December 2023 • © 2023 IOP Publishing Ltd

Engineering Research Express, Volume 6, Number 1

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Retracted: Effects of Polypropylene Waste Addition as Coarse Aggregates in Concrete: Experimental Characterization and Statistical Analysis

Advances in Materials Science and Engineering

Volume 2024, Issue 1, Advances in Materials Science and Engineering | First Published online: January 9, 2024

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First published: 08 November 2022
https://doi.org/10.1155/2022/7886722
Citations: 26

Academic Editor: Qian Chen

This article is part of Special Issue: Advanced Functional Graded Materials: Processing and Applications

Abstract

In recent times, thermoplastic waste materials are being extensively used as fine and coarse aggregates in the concrete mix as an environmentally friendly construction material. This study aims at utilizing polypropylene (PP) as a partial substitute for the conventional coarse aggregates in M30 grade concrete. The different replacement levels of coarse aggregates such as 0%, 20%, 40%, and 60% by weight were used in concrete. Sieve analysis, specific gravity, and water absorption tests were performed in all replacement levels of aggregates. The mechanical (compressive and split tensile tests) tests were conducted after 3, 14, and 28 days. The change in mechanical properties of concrete with the addition of different weight proportions of plastics was studied experimentally. Further, experimental values were

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Seismic Behaviour of High Rise Structure with Plan Irregularity

Shivanand C.G [1], Charan M Kudtarkar [2], Dhanyashree G Bhandarkar [3] Prakash N [4]
Assistant Professor, Department of Civil Engineering, The Oxford College of Engineering , Bangalore, Karnataka, India [1, 4]
PG student, Department of Civil Engineering, The Oxford College of Engineering, Bangalore, Karnataka, India [2, 3]

Abstract:
The objective of this paper is to investigate various plan irregularities in buildings during seismic events using analytical methods. The study encompasses different structural systems, with particular emphasis on the dual system, to assess its impact on various irregularities. The analysis primarily focuses on the variations in displacements within the structural systems. The analyses conducted in this study aim to determine the seismic performance of high-rise buildings and evaluate the influence of structural irregularities on factors such as stiffness, strength, mass, and their combinations. By considering these factors, the researchers seek to understand how different irregularities affect the overall response of the buildings to seismic forces.

Keywords: Plan Irregularity, Seismic performance, Stiffness, Strength

I. INTRODUCTION

Plan irregularity in the context of building structures refers to deviations or variations from regular and symmetrical floor plans. These irregularities can occur in different forms, such as changes in shape, setbacks, protrusions, or asymmetry within the building layout. Plan irregularities are of particular concern because they can amplify the effects of seismic forces and compromise the overall structural integrity of a building. Analyzing and understanding the behavior of buildings with plan irregularities is crucial for designing safe and resilient structures that can withstand seismic events

II. SIGNIFICANCE OF STUDY

The study of plan irregularities in building structures holds immense importance for several reasons. Plan irregularities can have a substantial influence on the structural behavior and performance of buildings during seismic events. By thoroughly examining and understanding these irregularities, engineers and architects can identify potential weaknesses or areas of concern. This knowledge allows them to implement appropriate design strategies and structural measures to enhance the building's ability to withstand seismic forces and ensure the safety of its occupants.

Plan irregularities can impact the overall functionality and efficiency of a building. They can affect the distribution of loads, the behavior of structural elements, and the overall stability of the structure. By studying plan irregularities, architects and engineers can gain insights into how these irregularities influence factors such as stiffness, strength, and mass. This knowledge can inform design decisions, allowing for the optimization of the building's performance and functionality.

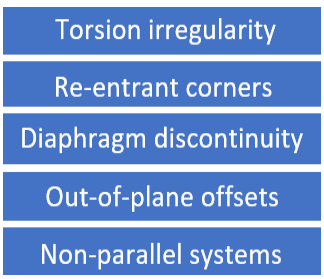

Figure-1. Different Plan Irregularities

The figure.1 describes different plan irregularities we may come across during configuration of any structure.

Figure-2 Plan Irregular Building (Kokaeli, Turkey, 1999)

Studying plan irregularities can lead to the development of improved design guidelines and practices. The findings and insights gained from such studies can contribute to the advancement of structural engineering knowledge and inform the development of design codes and standards. This, in turn, can lead to the creation of safer, more resilient, and structurally efficient buildings.

III. LITERATURE REVIEW

M. T. Raagavi et al. [1] has explored that the construction scenario where buildings often feature irregular geometries and elevations for aesthetic appeal, economic feasibility, or land availability reasons. However, studies indicated that regularly configured structures are generally more resistant to earthquakes than irregular ones. During seismic events, structures experience lateral deflections due to earthquake loads. The objective of this study was to investigate different types of building irregularities and their behavior when subjected to seismic forces. The researchers aimed to identify key parameters that was analyzed when assessing a structure's response to seismic forces. These parameters include displacement, base shear, storey drift, stiffness, strength, and

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Research Article Volume 13 Issue No.6

Seismic Response of High Rise Structure With Vertical Irregularity

Shivanand C.G [1], Dhanyashree G Bhandarkar [2], Charan M Kudtarkar [3]
Assistant Professor, Department of Civil Engineering, The Oxford College of Engineering, Bangalore, Karnataka, India [1]
PG student, Department of Civil Engineering, The Oxford College of Engineering, Bangalore, Karnataka, India [2, 3]

Abstract:
Multi-story structures developed these days have an open first story as an unavoidable component. It has been nearly common in growing countries like India where extra space specifically for parking is difficult. The strength or stability of the structure when comes to open storey is always a concern to all civil engineers under seismic forces. The objective of the present work is to gain insight into the behaviour of structure by varying soft storey level in high rise building. Soft storey in the building is introduced by floor height increase of a particular floor. Dynamic analysis is carried out using FEM software. The various parameters studied are displacement, inter story drift and storey stiffness to analyse the effect of irregularity.

Keywords: Soft storey, Seismic forces, Dynamic analysis, Irregularity

I. INTRODUCTION

In most of the developing countries thought the globe, towns and cities are developing at a rapid rate. The faster rate of growth results in more vertical development, as almost all of the horizontal expansion has come to end. In high-rise building, the lateral loads on the building have greater risk. The lateral loads are both earthquake load and wind load. The direction of the lateral loads results into higher secondary moments and additional forces in the building.

II. IMPORTANCE OF STUDY

An earthquake or ground motion generates inertia forces in a building; the majority of the structure's mass is located at the floor level. Initially, inertia forces are dispersed downwards by slabs and beams to columns and walls and then to foundations. Therefore, columns and walls in the lower storey are designed to be stronger than those in the upper storey due to higher earthquake induced forces.

Figure-1. Failure of open first storey in Bhuj Earthquake

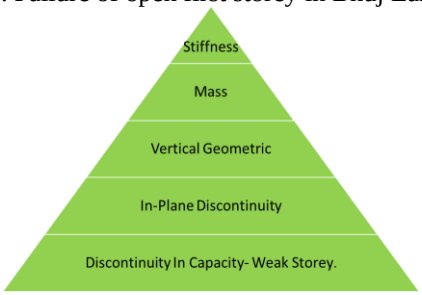

Figure-2. Different vertical Irregularities

The figure.2 describes different vertical irregularities we may come across during configuration of any structure.

Earthquakes are caused by differential movement in the earth's crust which results in the rapid release of stored strain energy that generates seismic waves causing ground shaking. This ground motion causes severe damage to the structure which is vulnerable to seismic waves. The way of behaving of a structure because of earthquake force relies upon its general shape, size, and math and furthermore the way that the seismic tremor force is done to the ground with next to no irregularity in the heap move. The seismic tremor powers created on various floors should be moved down along the level of the structure to the ground in the briefest way.

III. LITERATURE REVIEW

Hardik Bhensdadia et.al [1] studied G+4, G+9, and G+15 stories in different earthquake Zones & soft stories using the SAP 2000 y14 analysis package. The study is carried out using pushover analysis. Existing buildings situated in Rajkot are Considered for each case and are designed as per IS1893:2002, Earthquake Codal provision. Various building models were developed and pushover analysis was performed, pushover curve, and performed point, are Studied after the analysis. The displacement & Base shear of the building increases from the lower zone to the higher zone, because the magnitude of Intensity will be more for higher zones. Results of the study suggested that Beams & columns in a range of Life of Safety are required Beam jacketing & Column jacketing for increasing the stiffness of members in the exist buildings.

Sahara C Rathnasiri et.al [2] has done research on the development of an irregularity index based on dynamic characteristics to quantify the vertical geometric irregularities. The study compares the performance of the existing method in quantifying the degree of irregularity for the selected irregular building. These are analyzed using SAP 2000 software. Proposed irregularity index (Ψ) = Vf, regular / Vf, irregular where V is the fundamental mode base shear of the irregular frame. G+7 storey having 4bays with a uniform bay width of 5m and uniform storey height of 3.2m is adopted in this study by modeling 4 models having a floating column, stepped frame, setback frames, and normal building. Base shear and

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Statistical Optimization of Crude Oil Degradation using Bacterial Consortium and their Enzymes

Oct 2023 · Research Journal of Biotechnology 18(11):115-124
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Kumar S.V. Praveen · John Indulekha · K. Valarmathy · B.K. Manjunatha

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Abstract

The present study investigated the application of central composite design in enhanced crude oil remediation using bacterial consortium. The bacterial strains viz. KG-2, SMG-8, NR-3 and OK-6(2) isolated from soil were selected for the crude oil utilization studies. The strains were identified as Pseudomonas stutzeri-KX344913, P. stutzeri-KX289657, Providencia rettgeri-KX289656 and P. rettgeri-KX344914 respectively using 16s rDNA sequence. The preliminary degradation was done using the DCPIP redox-indicator and further degradation was conducted by using Response Surface Methodology (RSM) and the analysis of variance and regression model. CCD model was developed and batch experiments were performed to understand the significance of the four variables (pH, temperature, salinity and inoculum concentration) on the TPH degradation process by applying CCD based RSM.

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Antineoplastic Effects of Mucuna pruriens Against Human Colorectal Adenocarcinoma

Sagar Seetharamaiah [1], Vidya Shimoga Muddappa [2], Manjunatha Bukkambudhi Krishnaswamy [3], Rashmi Kanugodu Vasappa [4]

Affiliations

PMID: 37395947 DOI: 10.1007/s12010-023-04598-4

Abstract

Mucuna pruriens (MP) which is commonly known as "Velvet Bean" is an underutilized legume traditionally used to treat Parkinson's disease and male fertility issues. Extracts of MP have also been identified for their antidiabetic, antioxidant, and antineoplastic effects. Commonly, the antioxidant and anticancer properties of a drug are linked together as antioxidants scavenge free radicals and prevent the cellular DNA damage which could result in cancer development. In this investigation, comparative assessment of the anticancer and antioxidant potentials of methanolic seed extracts from two common varieties of MP, Mucuna pruriens var. pruriens (MPP) and Mucuna pruriens var. utilis (MPU) against human colorectal cancer adenocarcinoma cells COLO-205, was carried out. The highest antioxidant potential was recorded with MPP with an IC_{50} of 45.71 µg/ml. The in vitro antiproliferative effects of MPP and MPU on COLO-205 showed an IC_{50} of 131.1 µg/ml and 246.9 µg/ml respectively. Our results revealed intervention of the MPP and MPU extracts in growth kinetics of the COLO-205 cells in concomitance with apoptosis induction up to 8.73- and 5.58-folds respectively. The AO/EtBr dual staining and the flow cytometry results also confirmed the better apoptotic efficacy of MPP over MPU. MPP at a concentration of 160 µg/ml exhibited highest apoptosis and cell cycle arrest. Furthermore, effect of the seed extracts on p53 expression was investigated by quantitative RT-PCR and a maximum upregulation of 1.12-fold was recorded with MPP.

Keywords: Anticancer; Antioxidant; Apoptosis; Human colorectal carcinoma; Mucuna pruriens; p53 gene.

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Abstract

Mucuna pruriens (MP) which is commonly known as "Velvet Bean" is an underutilized legume traditionally used to treat Parkinson's disease and male fertility issues. Extracts of MP have also been identified for their antidiabetic, antioxidant, and antineoplastic effects. Commonly, the antioxidant and anticancer properties of a drug are linked together as antioxidants scavenge free radicals and prevent the cellular DNA damage which could result in cancer development. In this investigation, comparative assessment of the anticancer and

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A Comparative Study on Resource Aware Allocation and Load balancing Techniques for Cloud Computing.

Authors

Kamatar, Malatesh; Madhavi, P. Bindhu

Abstract

Advances in cloud networking, cloud infrastructure, and data processing necessitate resource management flexibility. Fault tolerance systems, which include effective load balancing and migration of applications without disturbing any other services operating, should be the key criteria for ensuring the high availability of cloud data centres. Providers of Cloud service should intelligently supply resources to every customers to achieve the optimum resource assignment in changing hosting frameworks. Moreover, many problems in load balancing approaches such as security, fault tolerance, etc exist in today's cloud computing environments. Realizing its relevance and importance, issue of resource aware load balancing in the cloud has received a lot of attention, and numerous load balancing methods is introduced in the literature. Study intends to focus on the survey of many resource aware allocation and load balancing approaches with their advantages and disadvantages. Finally, conclusion with future work is derived a novel technique based on optimization strategy that should guaranteed a drastic improvement in resource utilization on Cloud than existing approaches.

Subjects

RESOURCE allocation; CLOUD computing; SERVER farms (Computer network management); FAULT tolerance (Engineering); ANT algorithms; COMMUNICATION infrastructure

Publication

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Data must be protected against cybercrime as the network revolution grows and becomes more complicated. With the purpose to intentionally damage sensitive and secret information, cybercrimes cost the world economy billions of dollars. Because these crimes are perpetrated often, it is vital to increase cyberspace security to lessen and perhaps even prevent the effects of cybercrime. The internet of things (IoT) phenomena is now the subject of study, as privacy and safety are acknowledged as the primary concerns for Iot., particularly in light of the fact that they are being used in crucial contexts like healthcare systems. The current state of safety in the IoT sector is examined in this paper, along with security-related problems. We look at particular security needs and methods for resolving these problems. IoT safety is being recognised as a problem that blockchains may help with.

Published in: 2023 3rd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)

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The proliferation of IoT applications, notably in the sphere of health care, has led to discussion of patient health records utilising data gathered from IoT-connected devices. Biological data from patients' medical records is mined for health analysis and diagnosis. Certain types of illness, known as chronic illnesses, are completely quiet yet devastating if left untreated. Recent years have seen an uptick in interest from academics in the utilization of patient health information data for the pre-emptive identification of chronic diseases. On the other side, healthcare and medical assistance have benefited enormously from the implementation of recommender systems that use machine learning techniques. Using an Internet of Things device, this research implemented a medical recommendation system to aid in the early diagnosis and management of chronic conditions. The current technique made use of the dataset of digitised patient health records that is housed in the Physio Net data repository. The current dataset contains patient health records that have been documented in accordance with the diseases that have been identified and the doctor's diagnosis. The recommended technique uses K-nearest neighbour classification to identify the kind of ailment before using collaborative filtering to select the optimal course of treatment for patients. The outcomes of using the suggested methodology show that this technique, which is based on using patient symptom similarity, produces better results than previous methods and has a high precision in diagnosing and forecasting chronic illnesses. After determining the kind of disease using the closest neighbour classification method, the collaborative filtering strategy is utilised to select the optimal course of therapy for patients. The outcomes of using the suggested methodology show that this technique,

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Anticorrosive Polypyrrole/Barium Ferrite ($PPy/BaFe_{12}O_{19}$) Composites with Tunable Electrical Response for Electromagnetic Wave Absorption and Shielding Performance

Original Research Article Published: 06 January 2023

Volume 52, pages 2080–2093, (2023) Cite this article

Journal of Electronic Materials

Aims and scope

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C. H. Abdul Kadar, Muhammad Faisal, N. Maruthi, Narasimha Raghavendra, B. P. Prasanna, K. R. Nandan, S. R. Manohara, M. Revanasiddappa & C. K. Madhusudhan

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Abstract

This paper highlights the suitability of $PPy/BaFe_{12}O_{19}$ composites with tunable electrical properties as well as anticorrosive properties for broadband electromagnetic interference (EMI) shielding applications. A $PPy/BaFe_{12}O_{19}$ composite was structurally and morphologically investigated using x-ray diffraction, Fourier-transform infrared spectroscopy, Raman spectroscopy, and scanning electron microscopy (SEM) techniques.

Indian Journal of Engineering & Materials Sciences
Vol. 30, August 2023, pp. 614-621
DOI: 10.56042/ijems.v30i4.2520

Design and Analysis of 2D Photonic Biosensor with ML for Respiratory Virus Detection

Vishalatchi S[a], Kalpana Murugan[a*], Nagaraj R[b] & Gayathri H N[c]
[a]Department of Electronics and Communication Engineering, Kalasalingam Academy of Research and Education, Srivilliputhur 626 126, India
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[c]Department of Chemistry, The Oxford College of Engineering, Bengaluru 560 068, India

Received: 09 June 2023; Accepted: 05 August 2023

In this study, we have designed and integrated a novel photonic biosensor with a Machine Learning approach for the detection of five common respiratory viruses. The biosensor has been developed using a two-dimensional hexagonal photonic crystal defect structure, which has been designed through the use of Finite Difference Time Domain (FDTD) and Plane Wave Expansion (PWE) techniques to monitor wavelength shifts during virus detection. The analytes have been efficiently captured within the sensor's pores to optimize performance. The uniqueness of our sensor has been demonstrated through enhanced sensitivity (584nm/RIU) and a remarkable quality factor (9734). We have employed the naïve Bayes classifier Machine Learning algorithm to achieve accurate virus detection, leveraging parameters that have been extracted from the sensor design. Our integrated sensor and classifier have provided robust classification of virus types, outperforming existing methods, and yielding highly accurate results. Furthermore, to enhance user accessibility, we have developed a graphical user interface for intuitive result interpretation.

Keywords: Naïve Bayes, Sensor, Virus, 2D PhC, Hexagonal ring resonator, Sensitivity, Quality factor, Respiratory virus

1 Introduction

Viruses have long been acknowledged as perilous parasitic entities with the capacity to infect living organisms, giving rise to a broad spectrum of diseases. These infectious agents, characterized by their minuscule size and uncomplicated composition, have exclusively targeted living cells[1]. Within the host organism, viruses have thrived, replicated, and at times, rendered traditional antibiotic treatments ineffective. The primary objective of this study has been to introduce a highly sensitive sensor device capable of exceptionally accurate detection of the presence of viruses in blood samples[2]. Specifically, our focus has encompassed five viruses that frequently afflict the respiratory system: Influenza[3], Corona[4], Adeno[5], HBoV (Human Boca virus)[6], and Tuberculosis[7]. The consequences of respiratory infections[8] have been severe, potentially leading to fatal outcomes if not promptly detected and treated.

In recent years, the world has borne witness to the emergence of new and more menacing viruses, resulting in global pandemics. As Selma Souf has noted, viruses pose the most dangerous threats to human life[9], leading to grave health concerns. Innovative technologies, such as the Europium Nanoparticle-based Immune Assay (ENIA), have been developed for detecting Influenza A and B viruses in blood samples. Similar approaches have been employed to identify respiratory viruses, including swine-origin influenza A/H1N1 and SARS coronavirus. These endeavors underscore the paramount importance of early virus detection, which has been achieved through the utilization of a Photonic crystal environment.

A Photonic Biosensor is an established analytical device designed to detect analytes by amalgamating a reactive element with a physical and chemical indicator. The term "biosensors" was first introduced by Clark and Lyons in the 1960s. These sensors can be categorized as tissue-based, enzyme-based, or magneto/piezo-electric based sensors. Within these sensors, biological analytes have been recognized for their ability to modify the properties of light particles, encompassing the light source, waveguide medium, and photodetector[10]. Recently, ring resonators have gained prominence due to their diminutive size and prompt responsiveness. Two-dimensional photonic

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Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy

Volume 299, 15 October 2023, 122879

Encapsulated Co-ZnO nanospheres as degradation tool for organic pollutants: Synthesis, morphology, adsorption and photo luminescent investigations

Usha Jinendra [a], B.M. Nagabhushana [b], Dinesh Bilehal [a], Muzaffar Iqbal [c], Raghavendra G. Amachawadi [d], Chandan Shivamallu [e], Shiva Prasad Kollur [f]

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Highlights

- Doped ZnO-Co nanostructures were synthesized through the solution combustion process.
- PXRD, SEM, FTIR, Photoluminescence studies are used in this study.
- Isotherm and kinetics are investigated by analysing the degradation of Malachite Green dye.

Abstract

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FEM Analysis of Railway Brake Disc for Safety of Train

Publisher: IEEE Cite This PDF

Deepa. N. ; Sneha Sharma ; H N Gayathri ; Preeta Sharan ; Rakesh BR ; Abhishek Gopalakrishna Bhat **All Authors**

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Abstract:
Monitoring the temperature of disc brakes is crucial for ensuring their optimal performance in railway applications. To address this issue, a finite element analysis is conducted using Ansys software to assess temperature fluctuations in various parts of the brake under different conditions. Various factors such as payload, speed, and other variables can affect the braking mechanism and lead to brake failure. By installing a FBG sensor on the axle near the contact surface between the brake and the axle, it is possible to detect temperature changes as heat flows from the brake's outer frictional surface towards the axle. This is significant because a small temperature variation near the axle can have the same impact as a large temperature variation near the frictional surface.

Published in: 2023 10th International Conference on Computing for Sustainable Global Development (INDIACom)

Date of Conference: 15-17 March 2023

Publisher: IEEE

Date Added to IEEE *Xplore*: 04 May 2023

Conference Location: New Delhi, India

ISBN Information:

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Results in Optics
Volume 11, May 2023, 100376

Design and simulation of a highly sensitive one-dimensional photonic crystal for different chemical sensing applications

P.R. Yashaswini [a], H.N. Gayathri [b], Indira Bahaddur [a], PC Srikanth [b]

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Abstract

The main goal of this study is to construct a highly sensitive one-dimensional (1D) photonic crystal sensing system for chemical detection. Magnesium fluoride and cadmium fluoride, tantalum pentoxide and silicon dioxide, titanium dioxide and silicon dioxide, and zinc sulphide and silicon dioxide are the four different layer materials that have been taken into consideration. Defect layer width ranges from 3500 nm to 5000 nm. Every combination of layers that was taken into consideration exhibited sensitivity that was greater than 500 nm/RIU, according to the simulation results. In that combination of layers, silicon dioxide and titanium dioxide have shown the highest sensitivity of 675 nm/RIU. Defects wider than 4000 nm can achieve 98% transmission efficiency. The sensor displayed a Figure of Merit (FoM) of 8437, a limit of detection (LOD) of 7.30 $\times 10^{-6}$ RIU, and a maximum quality factor of 13,687.

Previous Next

Keywords

Photonic Crystal; Defects; Chemical Sensor; Sensitivity; Transmission efficiency; one-dimensional (1D) material; Figure of Merit (FoM); Limit of Detection (LoD)

1. Introduction

For the detection of blood plasma and malignant cells, a one-dimensional (1D) photonic crystal (PhC) based sensor has previously been developed (Ankita et al., 2021). The sensor was created by sandwiching layers of two different types of minerals, such as SiO2 and TiO2 (Haron et al., 2017). The effectiveness of the sensor system is assessed using several mathematical techniques. For a sample layer thickness increase from 100 nm to 300 nm, the sensing layer's sensitivity is raised to 71.25 nm/RIU. For haemoglobin, the sensing layer's sensitivity was 73 nm, while for blood plasma, it was 72 nm. In this research, a 1D photonic crystal-based biosensor for the diagnosis of malaria has been developed, and different blood sample concentrations have been used for sensing (Abd, 2023). Most of the photonic crystal sensor has been designed and analysed for biosensing application in detection of different bioanalytes and different micro pressure sensing application with photonic crystal strains sensor.

To diagnose malaria, a well-known transfer matrix approach has been used. The sensor's highest sensitivity has been measured at 495.63 nm/RIU.

Peak resonant shift has been observed for varying refractive indices of the sample layer (Goyal, 2020). A high-sensitivity photonic crystal biosensor has been designed and analyzed for bio-sensing application. In this paper, the area between the target analyte and the sensing layer has been increased to optimize the sensitivity of the sensing structure (Aly et al., 2021). A three-dimensional finite-difference time-domain (FDTD) simulation is considered during the analysis and the sensitivity of sensing structure was increased up to 500%. Then the mode profile

Communications in Mathematics and Applications

Restrained and Total Restrained Domination of Ladder Graphs

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https://orcid.org/0000-0003-0719-3637

DOI: https://doi.org/10.26713/cma.v14i4.2569

Keywords: Domination, Total domination, Restrained domination

ABSTRACT

Telle and Proskurowksi introduced restrained domination as a vertex partition problem in partial k-tress (Algorithms for vertex partitioning problems on partial k-trees, *SIAM Journal on Discrete Mathematics* **10**(4) (1997), 529 - 550). For a graph $G(V, E)$, a restrained domination number is the minimum cardinality of a subset $\mathfrak{D}$ of V such that for every vertex $v \in \bar{\mathfrak{D}}$ there is a vertex in $\mathfrak{D}$ as well as in $\bar{\mathfrak{D}}$ adjacent to v. If $\mathfrak{D}$ satisfies an additional condition that every vertex of V has a neighbor in $\mathfrak{D}$, then $\mathfrak{D}$ is said to be a total restrained dominating set. Minimum cardinality of $\mathfrak{D}$ is said to be

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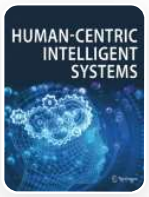

Human-Centric Intelligent Systems

Aims and scope

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Raghu Ramamoorthy

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Abstract

The dynamic characteristics of vehicular ad hoc networks (VANETs) demand reliable and secure communication over wireless media. However, there are significant contradictions in autonomous vehicular systems related to security and privacy. Furthermore, VANETs require

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An Energy Efficient IoT Based Smart Street Lighting Using Low Cost SOC

Publisher: IEEE Cite This PDF

Anitha Velu ; Raghu Ramamoorthy ; Manasa S M ; Devakirubai Navulkumar All Authors

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own if it is not in use. This work pres
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ON or OFF the street light based or
activated by either light or dark. This
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Published in: 2024 International Co
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Comparative Study and Analysis of Cloud Container Technology

Publisher: IEEE Cite This PDF

E. Saravana Kumar ; Raghu Ramamoorthy ; Selvaraj Kesavan ; T Shobha ; Seema Patil ; B Vighneshwari **All Authors**

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Abstract:
The advent of digital transformation has revolutionized the way businesses operate. Applications have become the focal point of this transformation, shifting the focus from being organization-centric to user-centric. To realize the full potential of businesses, high-quality, secure, and agile applications are essential. Containers are a cutting-edge invention in the world of virtualization, gaining immense popularity in recent years. They have replaced traditional business continuity solutions and are now used to address highly demanding business needs. Multiple containers and orchestration frameworks are available, both as standalone and cloud-based services. However, developers and industry experts face challenges in identifying and evaluating the appropriate containers and orchestration frameworks for their application needs. The selected tools may not always be feasible due to a lack of available features, inability to provide agility, and lack of platform support. When applications are deployed across multiple containers, coordination and management among container clusters become critical. Since containers play a pivotal role in edge deployment, cloud-native, continuous integration, and continuous deployment, it is vital to have centralized orchestration for proper re-source management and scheduling. This paper discusses and compares emerging container platforms and cloud-centric orchestration frameworks, highlighting the challenges involved.

Published in: 2024 11th International Conference on Computing for Sustainable Global Development (INDIACom)

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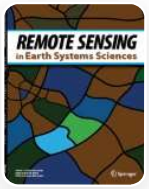
Analysis of Changes and Influences Using Remote Sensing and Geodetectors on How Human Activity Affects Ulansuhai Lake Basin Ecology

RESEARCH Published: 01 July 2024

Volume 7, pages 55–65, (2024) Cite this article



Remote Sensing in Earth Systems Sciences

Aims and scope

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Krishnasamy Vengatesan, Manoharan Rajesh & Eswaran Saravana Kumar

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Abstract

Investigating the Ulansuhai Lake in southwest Inner Mongolia, China, this study uses a holistic approach that incorporates many datasets and approaches to evaluate the ecological environmental quality of the area. The specific geographical features and climate of the research region allow for a thorough examination of ecological changes through time. The research finds significant regional and temporal changes in ecological quality, with

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E-ISSN: 2660-5309

Priority Based Lightweight Cluster Routing for Efficient Communication in Vehicular Ad Hoc Networks

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Keywords: VANETs, efficient routing, clustering, priority based routing

ABSTRACT

A vehicular ad hoc network (VANET) is a network that is dynamic and has no infrastructure. In VANET movable autonomous vehicles rely on wireless communication systems to form an autonomous, self-organized, and infrastructure-less network. VANETs are prone to frequent path failure due to their high mobility. High mobility causes the node state to change continuously, so routing and communication between vehicles are challenging tasks in VANET. At this point, to provide efficient routing, this work proposes a priority-based lightweight clustering model (P-LWCM) for cluster-based routing. In the proposed work, stable and efficient cluster heads and members are selected for routing in VANET. The proposed system uses various parameters including mobility, Packet Loss Ratio (PLR), Packet Misrouting Ratio (PMR), and Priority Ratio (PR) to select a vehicle as a cluster head or to include a

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Journal of Biophotonics / Volume 17, Issue 7 / e202400070

RESEARCH ARTICLE

Design and analysis of a fiber Bragg grating-based foot pressure assessment system

Preeta Sharan, Ghada A. Khouqeer, Basma A. El-Badry, Anup M. Upadhyaya

First published: 25 April 2024
https://doi.org/10.1002/jbio.202400070

Abstract

This research presents a comprehensive study focused on the design, implementation, and analysis of an innovative fiber Bragg grating (FBG) based foot pressure assessment system. FBG sensors strategically placed on the great toe, metatarsal 1, metatarsal 2, and heel provided distinct peak resonant wavelengths, strains, and pressures during experimental cycles. Participant 1 exhibited peak resonant wavelength of 1537.745 nm for great toe, 1537.792 nm for metatarsal 1, 1537.812 nm for metatarsal 2, and 1537.824 nm for heel. Participant 2 showcased distinct graphical representations with peak resonant wavelengths ranging from 1537.903 to 1537.917 nm. In a fracture patient condition, the FBG-based system monitored weight-bearing capacity, integrated with real-time X-ray imaging for dynamic insights of rehabilitation as distinct approach. The strains and pressures at each position exhibited notable variations along with the sensitivity of 1.31 με obtained across all positions, underscoring the FBG-based system's reliability in capturing subtle foot pressure.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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Journal of Biophotonics / Volume 17, Issue 7 / e202400083

RESEARCH ARTICLE

An FBG-based optical pressure sensor for the measurement of radial artery pulse pressure

Ranjith B. Gowda, Preeta Sharan, Saara K, Mona Braim, Abdullah N. Alodhayb

First published: 02 May 2024
https://doi.org/10.1002/jbio.202400083
Citations: 3

Abstract

One of the diagnostic tool for clinical evaluation and disease diagnosis is a pulse waveform analysis. High fidelity radial artery pulse waveforms have been investigated in clinical research to compute central aortic pressure, which has been demonstrated to be predictive of cardiovascular diseases. The radial artery must be inspected from several angles in order to obtain the best pulse waveform for estimate and diagnosis. In this study, we present the design and experimental testing of an optical sensor based on Fiber Bragg Gratings (FBG). A 3D printed device along with the FBG is used to measure the radial artery pulses. The proposed sensor is used for the purpose of quantifying the radial artery pulse waveform across major pulse position point. The suggested optical sensing system can measure the pulse signal with good accuracy. The main characteristic parameters of the pulse can then be retrieved from the processed signal for their use in clinical applications. By conducting experiments under the direction of medical experts, the pulse signals are measured. In order to experimentally validate the sensor, we used it to detect the pulse waveforms at Guan position of the wrist's radial artery in accordance with the diagnostic standards. The findings show that combining optical technologies for physiological monitoring and radial

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Design of optical sensor for cancer prognosis prediction using artificial intelligence

Research Article Published: 11 July 2023

Volume 53, pages 1009–1017, (2024) Cite this article

Journal of Optics

Aims and scope

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Ranjeet Kumar Pathak, Sumita Mishra & Preeta Sharan

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Abstract

A key role of the World Health Organisation is improving the proportion of patients with early cancer diagnosis. Due to the high rates of mortality and recurrence, the treatment process requires several months and is very expensive. Over the years, advancements in computer engineering and optical field communication have inspired numerous scholars to use a variety of computational algorithms to analyse and study the accuracy of the illness prognosis. This article discuss on the development of 2D-photonic crystal biosensor for detecting the variation in refractive index of healthy cell and different types of cancer cell. The variation in refractive index of cell is from 1.368 to 1.399. Work also shows how artificial intelligence algorithm can be used for detecting various types of cancer like blood cancer,

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Modeling and realization of photonic biosensor for hazardous virus detection using ML approach

Research Article Published: 07 February 2024

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Aims and scope

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S. Vishalatchi, Kalpana Murugan, Nagaraj Ramrao & Preeta Sharan

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Abstract

The broad range of sexually transmitted viruses are infections generally attained through uncertain sexual contact and can lead to serious health complications or may result in death if not diagnosed earlier. In this work, a Biosensor based on two-dimensional (2D) photonic crystal structures is proposed and integrated with Machine learning performance metrics. The 2D photonic crystal-based optical sensor platform produces a simulated signature outcome. The output spectral behavior varies according to the type of virus deducted. To calculate the accuracy, the signature data are trained and tested using the Machine Learning (ML) algorithm, k-Nearest Neighbors (kNN). The Modified Mach–Zehnder Interferometer (MMZI) structure shows the novelty of the work by attaining high sensitivity and quality

ScienceDirect

Optik

Volume 321, February 2025, 172148

A two-stage detection methodology for thyroid cancer using photonic crystal: Logistic regression and artificial neural networks

Ranjeet Kumar Pathak [a], Sumita Mishra [a], Sandip Kumar Roy [b], Preeta Sharan [c]

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https://doi.org/10.1016/j.ijleo.2024.172148

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Abstract

Cancer remains a significant health concern affecting many people globally. Recognizing the importance of early identification and treatment of thyroid cancer, we have developed a novel detection method utilizing supervised Machine Learning (ML) techniques, specifically Logistic Regression (LOR) and Artificial Neural Networks (ANN). Our approach leverages Photonic Crystal (PhC) sensors to detect thyroid cancer. Thyroid cancer affects the thyroid gland, which is responsible for regulating the body's growth and metabolism through hormone production. The incidence of thyroid cancer is increasing worldwide, making early and accurate diagnosis crucial for improving patient outcomes. Current detection methods like fine-needle aspiration biopsy and ultrasound have limitations in terms of accuracy, invasiveness, and cost. Thus, we propose the use of PhC sensors, which can detect changes in the Refractive Index (RI) of biological tissues caused by cancerous cells. In our two-stage detection methodology, the first phase uses LOR to classify specimens as benign or malignant based on data from PhC sensors. The second phase employs ANNs to further classify the malignant samples into papillary, follicular, medullary, or anaplastic thyroid

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Home International Journal of Information Technology Article

Computer-aided analysis of tapered roller bearings for rail transport system

Original Research Published: 28 December 2023

Volume 16, pages 831–839, (2024) Cite this article

International Journal of Information Technology

Aims and scope

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N. Deepa, Preeta Sharan & Sneha Sharma

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Abstract

The major objective of this research is to estimate the effects of temperature on tapered roller bearings through the investigation of strain and thermal behaviors. Autodesk Fusion 360 is chosen to design the geometry in the manner specified and employing ANSYS Workbench to perform Finite Element Analysis. The stresses between the roller, interior, and exterior rings can be evaluated by bearing studies. This study focuses on thermal and static analysis to determine the temperature at various bearing locations and to simulate the bearing's condition to anticipate its condition. From our computational analysis of coupled finite element analysis for range of temperatures between 150 and 190 °C we observe inner

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Home Optoelectronics Letters Article

Investigation on FBG based optical sensor for pressure and temperature measurement in civil application

Published: 19 August 2024

Volume 20, pages 531–536, (2024) Cite this article

Optoelectronics Letters

Aims and scope

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Somesh Nandi, Chethana K. ✉, T. Srinivas & Preeta Sharan

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Abstract

Optical fiber Bragg grating (FBG) sensors have advanced significantly in the last several years. The use of innovative FBG in temperature and pressure measurement is examined in this study. The benefits of FBGs, such as their compact size, low weight, resilience to corrosion, immunity to electromagnetic interference, distributed sensing, and remote monitoring, have brought attention to the growing research in this field of structural health monitoring of civil infrastructures. In this investigation, a novel model is proposed and implemented using ANSYS workbench and GratingMOD tool. It is shown that the central

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Journal of Healthcare Engineering / Volume 2021, Issue 1 / 1563844

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A Survey of Soft Computing Approaches in Biomedical Imaging

Manju Devi, Sukhdip Singh, Shailendra Tiwari, Subhash Chandra Patel, Melkamu Teshome Ayana

First published: 03 August 2021
https://doi.org/10.1155/2021/1563844
Citations: 9

Academic Editor: Jiawen Kang

Abstract

Medical imaging is an essential technique for the diagnosis and treatment of diseases in modern clinics. Soft computing plays a major role in the recent advances in medical imaging. It handles uncertainties and improves the qualities of an image. Until now, various soft computing approaches have been proposed for medical applications. This paper discusses various medical imaging modalities and presents a short review of soft computing approaches such as fuzzy logic, artificial neural network, genetic algorithm, machine learning, and deep learning. We also studied and compared each approach used for other imaging modalities based on the certain parameter used for the system evaluation. Finally, based on comparative analysis, the possible research strategies for further development are proposed. As far as we know, no previous work examined this issue.

1. Introduction

Medical imaging offers a noninvasive technique to look at the practical and structural information of internal organs. Currently, in medical imaging, a wide number of different image modalities are used. These modalities enable the radiologist to acquire a perfect spatial resolution in a noninvasive manner, typically providing the three-dimensional view of the anatomical and functional behaviour of the internal structure of human bodies like the heart,

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Highly sensitive lab-on-chip with deep learning AI for detection of bacteria in water

Original Research Published: 16 September 2019

Volume 12, pages 495–501, (2020) Cite this article

International Journal of Information Technology

Aims and scope

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Shaikh Afzal Nehal, Debpriyo Roy, Manju Devi & T. Srinivas

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Abstract

Artificial Intelligence (AI) has provided a new insight on how to make better predictions in water quality. AI uses convolutional neural networks (CNN) modeled after the human brain. In this work we have started implementing deep learning techniques to predict level of bacterial contaminants in water. A look-up table is used to classify the level of sensing parameters based on signature of the bacteria. AI will be very helpful for accurate prediction based on signature as identified by the sensor. We have simulated an AI-based lab-on-chip application platform that can detect the contamination using the output from Photonic Crystal based optical biosensor. The presence of bacteria in water changes the output

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Computers and Computing

Evaluating Puncture and Non-puncture for the Turbo Code Model based on AWGN Channel with 16-QAM

R. Rashmi & Manju Devi

Pages 6791-6801 | Published online: 22 Apr 2024

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Abstra

In genera uations, nam anges of inform ns require improvec ork. As a coding pl le code rate, and length, and crossover programmed rehash with good error-detecting

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CON

capability. The execution boundaries of 5G advancements are normal and are tens and thousands of times better compared with 4G. In this paper, the evaluations of puncturing and non-puncturing for turbo code depending on the minimization of penetrating of efficient pieces are discussed. It also provides penetrating of equality pieces considering additive white Gaussian noise (AWGN) Channel with 16 quadrature amplitude modulation (QAM) to attain high spectral efficiency. In addition to this, the super encoder encodes the separated progression with a code speed of 1/3. The code block association progressively connects the yields from the super encoder. The sign mapper employed in this paper adjusts the progression using a 16-QAM balance. Also, the mapper takes effective pieces, one uniformity bit from the upper encoder, and the deinterleaved equity bit from the base encoder. The Orthogonal frequency-division multiplexing (OFDM) mapper parts into more modest equivalent channels, named subcarriers and the information is sent on these equivalent channels at a reduced rate.

KEYWORDS: 5G AWGN Channel Channel coding Iterative decoding algorithm Puncturing Non-Puncturing QAM Turbo code

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Comparison of Face Recognition Using PCLDA and Neural Network

V. Vijaya Kumari

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Abstract

Facial recognition is a complex multidimensional structure that demands sophisticated computing techniques for authentication purpose. In this paper, we introduce the Integral Normalized Gradient Image (INGI) algorithm with various normalizing stages. The system comprises a novel illumination insensitive preprocessing method, a hybrid Fourier based feature extraction and matching process. The Pre-processing method is grounded in the analysis of the facial imaging model, considering intrinsic and extrinsic factors of the human face. Feature extraction encompasses hybrid Fourier features extracted from different frequency bands and multiple face models. By deriving Fourier features from three Fourier domains and three distinct frequency bandwidths, we acquired additional complementary features. These features are individually classified using Principal Component and Linear Discriminant Analysis (PCLDA). This approach enables in analyzing a face image from the various viewpoints for identity recognition. Furthermore, we propose multiple face models based on different eye positions with a same image size. This contributes significantly to enhancing the performance of the proposed system. Recognition is achieved through Euclidean Distance and Neural Network based classifier, resulting in a recognition accuracy of approximately 89.23% for the Euclidean Distance classifier-based model and 93.40% for Back Propagation Neural Network Classifier.

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Implementation of Wireless Quick Response Code Using MCU ESP8266

Dr.V.Vijaya Kumari,Professor
Department of Electronics and Communication Engineering,
The Oxford College of Engineering,Bangalore-560 068

Abstract

QR scanners are seen in almost all places and the aim of this paper is to revolutionize information accessibility by providing a seamless Wi-Fi- based solution by eliminating the need for Quick Response scanners. To achieve this we use server-client communication method, where the NODE Micro Controller Unit (ESP8266) functions as the server, while a mobile application serves as the client. By leveraging this technology, users will be able to effortlessly retrieve data within their proximity without the need for QR codes, enhancing convenience and improving overall accessibility.
Keywords: Scanner, server, client, communication, node MCU ,mobile data

1.Introduction

In today's fast-paced world, people are constantly on the go, and time is of the essence. One common issue that people face in busy places such as airports, train stations, and shopping malls is the difficulty of scanning QR codes quickly and efficiently. Traditional QR codes require users to scan a physical code within a small distance to read the information, which can be inconvenient and time-consuming in crowded or busy environments.

To solve this problem, wireless QR technology can be implemented, which allows users to read information stored on a local server without the need for physical scanning. With wireless QR, the user's device (such as a smartphone or tablet) can read the information remotely, eliminating the need for physical scanning. This technology uses server-client communication through Wi-Fi to send information from the server to the client when a request is made within a specific range. This range can be customized to suit the needs of the application.

Client-Server Based Applications examines exploring their architecture, functionalities, and potential research opportunities. The author discusses various aspects such as communication protocols, data storage, security, and scalability, highlighting the importance of client-server models in modern computing systems. The paper offers insights into current trends and identifies areas for further investigation in this field[1]. This study provides a comprehensive analysis of client-server architecture, focusing on the utilization of the HTTP protocol for efficient data transmission. The paper explores the functionalities and interactions between clients and servers in this model, highlighting the role of HTTP in facilitating communication and data exchange[2]. A novel approach for controlling a prosthetic hand using an ESP8266 Wi-Fi module and an Android application describes the design and implementation of the interface, which enables users to manipulate the prosthetic hand wirelessly through their mobile devices. The study showcases the potential of integrating Wi-Fi technology and mobile applications in enhancing the functionality and accessibility of prosthetic devices, opening up new possibilities for improving the quality of life for individuals with limb impairments [3] The system for controlling electric switches using an Android application via Wi-Fi. The authors describe the design and implementation of the system, which allows users to remotely switch on or off electrical devices through their mobile devices [4]. By providing a user-friendly interface and wireless connectivity, the proposed system offers an innovative solution for remote switch control, contributing to improved energy management and automation in residential settings [5]. By leveraging Wi-Fi technology, the proposed system offers convenient and widespread access to information, contributing to improved connectivity and accessibility in various environments [6].

2.METHODS

In order to enable communication between an ESP8266 NodeMCU board and a mobile application, it is necessary to establish a Wi-Fi connection that facilitates the exchange of data without requiring a connection to the internet. This can be accomplished by configuring sever client communication between the devices where ESP8266 acts as an access point or server and the mobile application as a station or client as in Fig 1.

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IR Wireless Underwater Communication System: A Survey of Underwater Wireless Sensor Networks

V.Vijaya Kumari[1], Rakshitha h[2],Umme kulsum[3],Shambhavi vn[4],Sakshi Gadig[5]

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The Oxford College of Engineering, Bangalore, India

Abstract:Ir wireless underwater communication system was motivated by the need for robust and flexible solutions that can satisfy the requirements for the rapid development of the underwater wireless sensor networks. This survey paper identifies the key requirements for achieving essential services as well as common platforms and also contributes the critical elements in underwater wireless sensor networks by classifying on architectural elements, communications, routing protocol and standards, security, and applications of underwater wireless sensor networks

The aim of this paper delves into the role of underwater wireless communication technology as well as signal processing techniques for improve the capability of data communication in underwater environment. We discuss the underwater wireless sensor networks, such as underwater acoustic networks,Ip network, in ir wireless underwater communication system and their impact on usability and efficiency.

By presenting a comprehensive review of the latest advancements and challenges in the field, this survey paper offers insights into the future potential of ir wireless underwater communication system. We identify emerging trends and research directions that could shape the evolution of underwater systems, paving the way for more personalized and efficient smart communication.

Keywords-underwater Sensor Networks, acoustic communication, ocean environment, wireless sensor network

1. Introduction

IR based underwater communication system that can be used for wireless communication of messages in water. The system is very cheap alternative to long heavy physical wires that run through seas, rivers and require large wires and their maintenance.

The design of the project is to focus on the transmitting light signal from the transmitter end to the receiver end using the infrared light radiation equipment in underwater and this design is said to be underwater wireless communication system.

This survey paper aims to provide a comprehensive overview ofefficient and affordable IR wireless underwater communication system using the Raspberry Pi Pico that can be used for various underwater application including exploration and monitoring. The paper explores the different types of underwater communication and methodologies used in this field, as well as the latest advancements in sensor technology.

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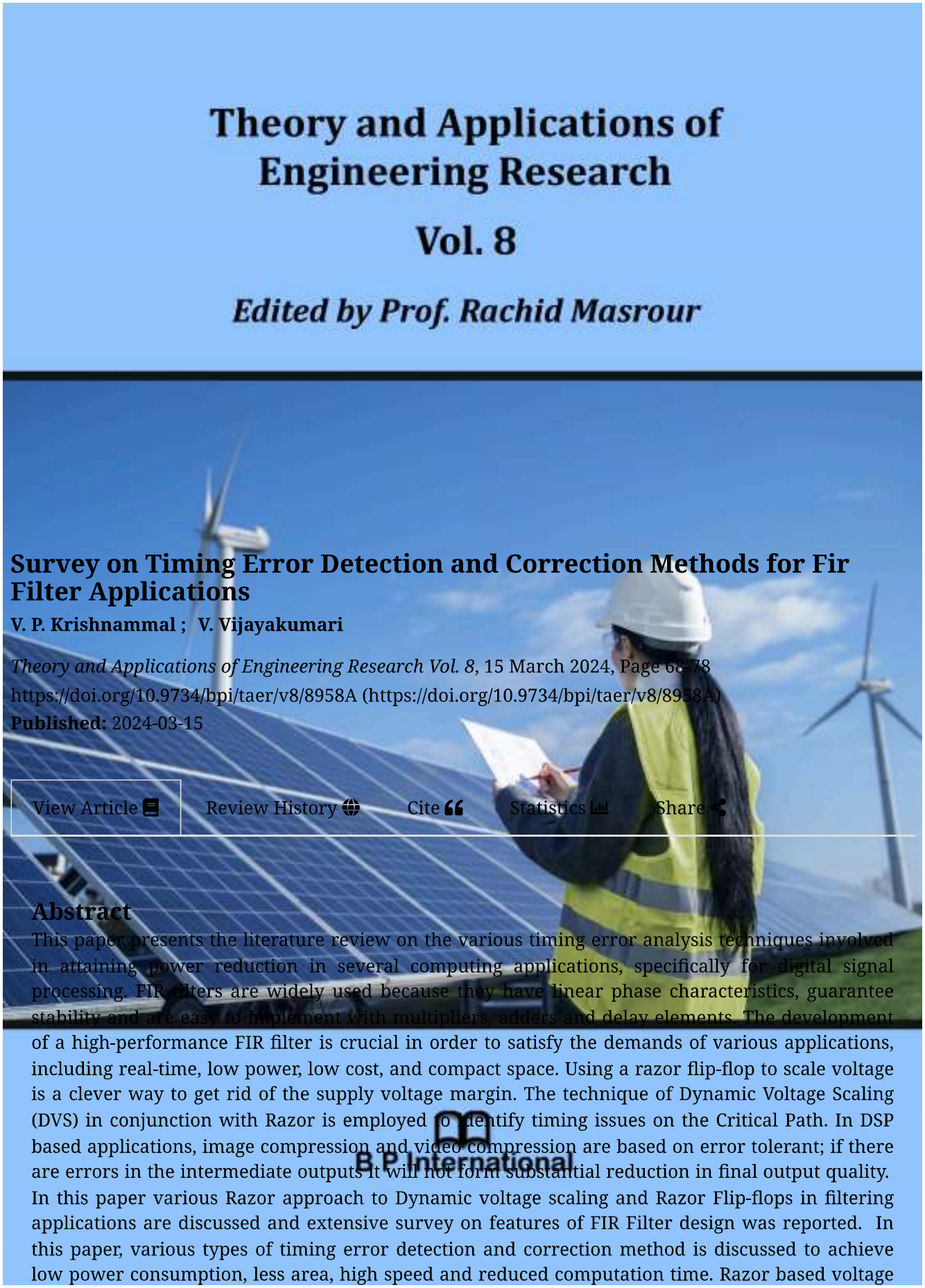

Survey on Timing Error Detection and Correction Methods for Fir Filter Applications

V. P. Krishnammal ; V. Vijayakumari

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Abstract

This paper presents the literature review on the various timing error analysis techniques involved in attaining power reduction in several computing applications, specifically for digital signal processing. FIR filters are widely used because they have linear phase characteristics, guarantee stability and are easy to implement with multipliers, adders and delay elements. The development of a high-performance FIR filter is crucial in order to satisfy the demands of various applications, including real-time, low power, low cost, and compact space. Using a razor flip-flop to scale voltage is a clever way to get rid of the supply voltage margin. The technique of Dynamic Voltage Scaling (DVS) in conjunction with Razor is employed to identify timing issues on the Critical Path. In DSP based applications, image compression and video compression are based on error tolerant; if there are errors in the intermediate outputs it will not form substantial reduction in final output quality. In this paper various Razor approach to Dynamic voltage scaling and Razor Flip-flops in filtering applications are discussed and extensive survey on features of FIR Filter design was reported. In this paper, various types of timing error detection and correction method is discussed to achieve low power consumption, less area, high speed and reduced computation time. Razor based voltage scaling can be implemented for filter application.

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Keywords: Dynamic voltage scaling (DVS); finite impulse response (FIR) filter; razor flip-flop; multipliers

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Control of Switched Reluctance Motor and Noise Reduction Using Fuzzy Controller in Matlab/Simulink

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Index Terms

Switched Reluctance Motor (SRM), fuzzy logic controller, acoustic noise, radial force, MATLAB/Simulink

Abstract

Switched Reluctance Motor (SRM) has been successfully used for its excessive efficiency and higher strength to torque ratio. However, the only demerit it has its radial pressure and acoustic noise. When SRM achieves higher speeds, it tends to generate more force between stator and as a result acoustic noise with higher decibels is a concern. In this paper, a layout is used for reduction of both radial force and acoustic noise for eight/6 SRM using the fuzzy logic controller by controlling the speed and current as a feedback loop. The mathematical models are framed to resolve glitches associated to radial pressure and acoustic noise. In this proposed method the SRM produces a very low noise level when it rotates at the speed of 1200 RPM. This method also has been implemented in MATLAB/Simulink platform mainly to reduce the acoustic noise at higher speed in SRM.

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International Journal of Engineering and Manufacturing (IJEM)

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Fibre Bragg grating sensors are investigated in various structural health monitoring systems. Most of these research used a variety of FBG sensors to assess the structures' temperature and strain. The FBG sensor is combined with two fixed and cantilever beam structures in the proposed study. A wide range of pressure and temperature are considered during the analysis. In different circumstances, the range of wavelength shift obtained has been evaluated. In mathematical modelling, the definition of the correlation between variables has been taken into consideration using linear regression approaches. The fixed beam model demonstrated good agreement with a *R*-squared score of 96%. For a cantilever beam, *R* squared was 88%. The obtained wavelength range of the cantilever beam is larger,

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An investigation of stress and temperature analysis at the rail-wheel contact using an optical simulation study

Publisher: IEEE Cite This PDF

Deepa. N ; Sneha Sharma ; Preeta Sharan ; Ruchira Srinidhi **All Authors**

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Abstract:
This study investigates static stress and temperature analysis of rail wheels at varying speeds using finite element analysis (FEA) and fiber Bragg grating (FBG) sensors. ANSYS 2023 R2 software analyzes FEA behavior, focusing on maximum and minimum equivalent strain and stress. Grating MOD in R-Soft simulates FBG sensor response to strain, resulting in wavelength variation. Results show higher speeds increase equivalent stress and strain, potentially damaging rail and wheel materials. FBG sensors monitor strain and temperature variations, guiding design optimization for improved performance and safety. Speeds from 10 to 100 kmph yield a strain sensitivity of 1.209 pm/με for Bragg's wavelength of 1550 nm, with corresponding FBG temperature sensitivity around 13 pm/°C.

Published in: 2024 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT)

Date of Conference: 12-14 July 2024 **DOI:** 10.1109/CONECCT62155.2024.10677308

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Investigation on FBG based optical sensor for pressure and temperature measurement in civil application

Published: 19 August 2024

Volume 20, pages 531–536, (2024) Cite this article

Optoelectronics Letters

Aims and scope

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Somesh Nandi, Chethana K., T. Srinivas & Preeta Sharan

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Abstract

Optical fiber Bragg grating (FBG) sensors have advanced significantly in the last several years. The use of innovative FBG in temperature and pressure measurement is examined in this study. The benefits of FBGs, such as their compact size, low weight, resilience to corrosion, immunity to electromagnetic interference, distributed sensing, and remote monitoring, have brought attention to the growing research in this field of structural health monitoring of civil infrastructures. In this investigation, a novel model is proposed and implemented using ANSYS workbench and GratingMOD tool. It is shown that the central

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A comprehensive review of using optical fibre interferometry for intrusion detection with artificial intelligence techniques

Research Article Published: 04 December 2024

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Aims and scope

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Hitesh Mehta, Nagaraj Ramrao & Preeta Sharan

Abstract

Security remains a critical concern in today's world, especially for protecting high-value assets and vital infrastructure such as refineries, petrochemical plants, government facilities, and military installations. Traditional security measures often fall short against increasingly sophisticated threats. To meet these challenges, perimeter intrusion detection systems (PIDS) have become indispensable. Optical fiber interferometry (OFI), an advanced sensing technology, provides key advantages for PIDS, including high sensitivity, real time monitoring, immunity to electromagnetic interference, and long-range coverage. This research explores the integration of OFI with machine learning and deep learning

ScienceDirect

Cryogenics

Volume 143, October 2024, 103934

Highly sensitive one-dimensional Dielectric-Superconductor photonic crystal structure for low temperature sensing applications

Bishwajeet Pandey [a] [b], Raju Hajare [c], Ranjith B Gowda [d], Wan Aezwani Wan Abu Bakar [b], Preeta Sharan [e]

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Highlights:

- A low temperature sensor is designed using 1-dimensional photonic crystal.
- Dielectric-superconductor layer is used as 1D photonic crystal sensor.
- Fabrication complexity is reduced by using single substrate (superconductor)
- For the first time, a very high sensitivity of 1.524nm/K is achieved.

Abstract

International Journal of Engineering and Manufacturing (IJEM)

IJEM Vol. 14, No. 3, 8 Jun. 2024

Cover page and Table of Contents: PDF (size: 1031KB)

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Control of Switched Reluctance Motor and Noise Reduction Using Fuzzy Controller in Matlab/Simulink

PDF (1031KB), PP.36-47

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Author(s)

B. Srilatha [1,*] **Sheeba Kumari C** [1] **Tina Elizabeth Thomas** [1]

1. Department of Electronics & Communication Engineering, The Oxford College of Engineering, Bangalore-68, India

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DOI: https://doi.org/10.5815/ijem.2024.03.04

Received: 19 Jan. 2024 / Revised: 6 Feb. 2024 / Accepted: 4 Mar. 2024 / Published: 8 Jun. 2024

Index Terms

Switched Reluctance Motor (SRM), fuzzy logic controller, acoustic noise, radial force, MATLAB/Simulink

Abstract

Switched Reluctance Motor (SRM) has been successfully used for its excessive efficiency and higher strength to torque ratio. However, the only demerit it has its radial pressure and acoustic noise. When SRM achieves higher speeds, it tends to generate more force between stator and as a result acoustic noise with higher decibels is a concern. In this paper, a layout is used for reduction of both radial force and acoustic noise for eight/6 SRM using the fuzzy logic controller by controlling the speed and current as a feedback loop. The mathematical models are framed to resolve glitches associated to radial pressure and acoustic noise. In this proposed method the SRM produces a very low noise level when it rotates at the speed of 1200 RPM. This method also has been implemented in MATLAB/Simulink platform mainly to reduce the acoustic noise at higher speed in SRM.

Cite This Paper

B. Srilatha, Sheeba Kumari C, Tina Elizabeth Thomas, "Control of Switched Reluctance Motor and Noise Reduction Using Fuzzy Controller in Matlab/Simulink", International Journal of Engineering and Manufacturing (IJEM), Vol.14, No.3, pp. 36-47, 2024. DOI:10.5815/ijem.2024.03.04

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Measurement: Sensors

Volume 32, April 2024, 101067

Harris Hawks Optimization Algorithm for reducing THD using ZVT-ZCT-based QRCC: A comparative approach

Nisha C. Rani [a], N. Amuthan [b]

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Abstract

This study proposes a novel solution to address harmonic issues in a Renewable Energy Resource System (RES) connected to the grid, using a Voltage Source Inverter (VSI) controlled by a QRCC based on Zero Voltage Transition and Zero Current Transition (ZVT-ZCT). We enhance system performance by integrating Harris Hawks Optimization (HHO) with the VSI. Key outcomes include evaluating the system's effectiveness in terms of voltage drop, current drop, real power, active power, and total harmonic distortion (THD). Notably, settling times for various converters are highlighted: 0.01 s for SEPIC, 0.008 s for CUK, 0.005 s for ZETA, and an impressive 0.0001 s for the Cascade converter. Under different operational conditions, open-loop operation yields a THD of 18.45%, reduced to 7.843% in closed-loop with PI controller. Optimization techniques further improve the system, achieving a low THD of 0.0549%. We emphasize the significance of MPPT-based INC-IR for cascade converters, resulting in a minimal switching loss of 0.38W, showcasing the system's efficiency in energy conversion.

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Oxidation Characteristics Of Thermal-Sprayed Cobalt-Based Superalloy Coatings: A Review

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- GAUTAM JALBA NARWADE
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Abstract

Superalloys go through cyclic oxidation which refers to the progression of reputed exposure of materials to alternating oxidizing and non-oxidizing environments at high temperatures. The oxidation behavior of cobalt-based superalloy coatings depends on several variables, including the environment, surface roughness, manufacturing conditions, & coating composition. Because of their higher temperatures and protective oxide layer, coatings with a greater cobalt concentration are more oxidation-resistant. The behavior of oxidation is influenced by surface roughness, where rough surfaces offer greater surface area to oxidation while smooth surfaces decrease interaction with the environment. The microstructure and porosity of the coating are further impacted by processing variables used in thermal spraying, including temperature, particles velocity, and spray distance. Adding reactive components to the coating composition, such as silicon and aluminum, and applying post-treatments like nitriding or sealing are two ways to increase oxidation resistance. A greater temperature and particle speed can lead to a denser with less porous covering, improving the oxidation process resistance. The two typically used heat spraying techniques are high-velocity oxy-fuel (HVOF) and plasma spraying. To increase the resistance to oxidation of thermal spray cobalt-based superalloy coating, some strategies have been devised, such as inclusion of reactive materials, such as aluminum and silicon, which is the coating composition. These elements may establish an oxide layer protecting the coatingâ€™s appearance, preventing further oxidation.

Suggested Citation

S. Suresh Kumar & M. Raviprakash & C. Durga Prasad & R. N. Chikkangoudar & Shrishail B. Sollapur & Yugesh A. Kharche & Gautam Jalba Narwade, 2024. "Oxidation Characteristics Of Thermal-Sprayed Cobalt-Based Superalloy Coatings: A Review," Surface Review and Letters (SRL), World Scientific Publishing Co. Pte. Ltd., vol. 31(11), pages 1-12, November.

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ORIGINAL CONTRIBUTION Published: 26 March 2024

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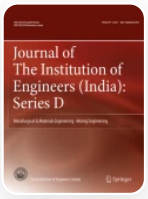

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Abstract

An electromagnetic field provides energy to the material directly during microwave processing. As a result, there are less thermal gradients and a quick heating of the entire material thickness. Additionally, volumetric heating can conserve energy and shorten production times. In the current study, a 900-W power level and 2.45-GHz microwave furnace were used to generate a cobalt-based coating on titanium substrate. The processing

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Investigation of Mechanical and Metallurgical Properties of Friction Welded Joints for Dissimilar Metals (HSS M2 and EN8 Steel)

ORIGINAL CONTRIBUTION Published: 27 February 2024

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This study examines the effects of changing process parameters on the rotary friction welding of comparable (16MnCr5) and different (HSS M2 and EN8 Steel) metals. Weld joints between combination metals that are comparable and different are examined for joint strength, hardness, tensile strength, and microstructure. Under the tensile test, joint strength was also assessed. Furthermore, the tensile strengths of the comparable and

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Optimization of Processing Parameters and Wear Performance of B_4C Reinforced AA6061 Composites Through Taguchi Methodology

ORIGINAL CONTRIBUTION Published: 29 July 2024

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C. Manjunatha, K. R. Varun, K. C. Nagaraja, Piyush Kumar Soni, R. Suresh Kumar, Chandan Prasad, Prakash Kumar & K. G. Nithesh

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Abstract

Two or more elements with different physical and chemical characteristics make up the composite material. The composite may be prepared using a variety of methods, but stir casting is a popular choice since it is easy to use and reasonably priced. In this investigation, stir casting was used to create AA6061-Boron Carbide (B_4C) composites. Composites with 10% weight percentage of B_4C were selected for wear analysis. The Taguchi technique was

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Journal of Biophotonics / Volume 17, Issue 7 / e202400070

RESEARCH ARTICLE

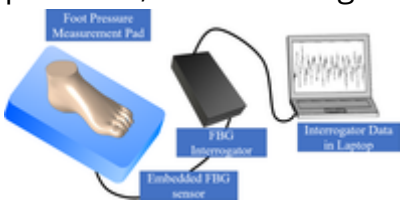
Design and analysis of a fiber Bragg grating-based foot pressure assessment system

Preeta Sharan, Ghada A. Khouqeer, Basma A. El-Badry, Anup M. Upadhyaya

First published: 25 April 2024
https://doi.org/10.1002/jbio.202400070

Abstract

This research presents a comprehensive study focused on the design, implementation, and analysis of an innovative fiber Bragg grating (FBG) based foot pressure assessment system. FBG sensors strategically placed on the great toe, metatarsal 1, metatarsal 2, and heel provided distinct peak resonant wavelengths, strains, and pressures during experimental cycles. Participant 1 exhibited peak resonant wavelength of 1537.745 nm for great toe, 1537.792 nm for metatarsal 1, 1537.812 nm for metatarsal 2, and 1537.824 nm for heel. Participant 2 showcased distinct graphical representations with peak resonant wavelengths ranging from 1537.903 to 1537.917 nm. In a fracture patient condition, the FBG-based system monitored weight-bearing capacity, integrated with real-time X-ray imaging for dynamic insights of rehabilitation as distinct approach. The strains and pressures at each position exhibited notable variations along with the sensitivity of 1.31 με obtained across all positions, underscoring the FBG-based system's reliability in capturing subtle foot pressure.



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The authors declare no conflicts of interest.

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Integrating Photonics and Fiber Bragg Grating Sensors with Deep Reinforcement Learning for Advanced Robotic Systems

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This research introduces the Photonics-Enhanced Embedded Robotic Intelligence Model (PEERIM), an innovative approach that integrates fiber Bragg grating (FBG) sensors with photonics and deep reinforcement learning (DRL) for advanced robotics applications. Addressing the limitations of current AI models in dynamic and complex environments, PEERIM leverages the rapid data transmission capabilities of photonics to process high-frequency sensor data, enabling real-time decision-making and enhanced automation. The methodology encompasses the development and integration of a variant of the Proximal Policy Optimization (PPO) algorithm, tailored to manage the continuous data stream and execute precise, adaptive control. The proposed model has been empirically evaluated, demonstrating a significant improvement in handling real-time sensor data with an average reward of 99.02 and a low average loss of 0.099, indicating robust performance and learning stability. These findings suggest that PEERIM provides a substantial advantage over existing AI-driven robotic systems, offering a scalable solution for a variety of challenging applications. The study's contributions lay the groundwork for future advancements in autonomous systems, promising a new era of precision and reliability in robotics.

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Personalized recommendation systems are pivotal in the thriving e-commerce fashion sector, enriching customer experiences and driving sales. This paper introduces an innovative method to enhance e-commerce fashion sales through personalized recommendations. The model merges Singular Value Decomposition (SVD) Reranking with customer grouping, yielding tailored product suggestions for distinct customer segments. The study comprehensively explores multiple recommendation techniques, assessing their performance using Mean Average Precision (MAP) scores. Results demonstrate the superiority of the proposed model, achieving a validation score of 0.032007. This success is attributed to the model's ability to capture latent features and offer personalized suggestions based on customer group traits. This research underscores the significance of personalized recommendations in boosting ecommerce fashion sales. The proposed approach, SVD Reranking with customer grouping, excels in providing personalized suggestions across diverse customer segments. These findings contribute to the advancement of recommendation systems in fashion, fostering customer satisfaction, minimizing returns, and bolstering sustainability.

Published in: 2024 11th International Conference on Computing for Sustainable Global Development (INDIACom)

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Advanced Neural Network Approaches for Distinguishing Real from Synthetic in GAN-generated Data Authenticity Challenges

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T Subaranjani ; N Jayaraj **All Authors** •••

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III. Proposed Model

IV. Results and Discussion

V. Conclusion

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Abstract:
Amid the transformative advancements of Generative Adversarial Networks (GANs) in machine learning, a pertinent challenge arises: discerning real instances from synthetic ones. This research introduces a novel neural network model meticulously tailored to differentiate between genuine tasks and those artfully crafted by GANs. The paper elaborates on the unique architectural design and optimization techniques employed, offering a comprehensive insight into the model's development and testing phases. Empirical evaluations reveal an unparalleled accuracy rate, underscoring the model's practicality and efficacy. Notwithstanding its high precision and recall balance, the study identifies potential areas of refinement, ensuring its adaptability to future GAN sophistications. As the realm of artificial data generation continues to evolve, this research stands as a beacon, advancing the understanding and tools essential for maintaining authenticity and integrity in data-driven domains.

Published in: 2024 11th International Conference on Computing for Sustainable Global Development (INDIACom)

Date of Conference: 28 February 2024 - 01 March 2024 **DOI:** 10.23919/INDIACom61295.2024.10499002

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A Hybrid Deep Learning Approach for Accurate and Transparent Maize Plant Disease Classification

Publisher: IEEE Cite This PDF

P. Bindhu Madhavi ; T Subaranjani ; Sumith Sigtia ; Vidhan Mehta **All Authors**

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Abstract:
Within the domain of agricultural progress, accurately identifying instances of plant diseases emerges as a pivotal hurdle. We introduce a fresh approach to classify diseases in maize plant leaves by combining a hybrid model that merges Convolutional Neural Networks (CNNs) for visual recognition with Multi-Layer Perceptrons (MLPs) for transparency. This amalgamation aims to bridge the gap between precision and comprehensibility. Our study begins by scrutinizing the constraints of prevailing CNN and MLP-based models in the context of disease classification. Subsequently, we present our hybrid architecture, elucidating its benefits and addressing inherent challenges. Through rigorous experimentation, we showcase the model's remarkable performance, achieving training, validation, and test accuracies of 98.98%, 96.19%, and 95.76%, respectively. The significance of our proposed model lies in its potential to transform disease management in agriculture. The fusion of accuracy and interpretability not only equips farmers with actionable insights but also establishes a model for ethical and transparent AI implementation. This research propels the field forward by providing an inventive hybrid solution that excels not only in accuracy but also harmonizes with practical agricultural scenarios, thus paving the path for a more sustainable and enlightened future.

https://doi.org/ 10.33472/AFJBS.6.5.2024.183-194

African Journal of Biological Sciences

Homology Modeling and DockingInvestigations of Polyglutamine (PolyQ) and Non-PolyQ Peptides for the Treatment of Huntingtin's Disease.

Indulekha John[1], R.Remya[2],Salma Kausar M[3], Ram Kumar Chenthur Pandian[4],K.Valarmathy[5*]

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ABSTRACT

The first exon of the HTT (Huntingtin) gene has an aberrant increase of CAG repeats, which causes Huntingtin's disease, a neurological illness disease called Huntingtin. This genetic anomaly leads to creation of an aberrant protein of Huntingtin protein called as (Htt) which has extended poly-glutamine sequences of varying lengths, which aggregate and become toxic to the brain, causing significant damage. Although the exact role of the HTT gene is unknown, it is known to be essential for the prenatal development of neurons in the brain. While thorough reversal for the damage of brain is currently beyond our capabilities, there is promising research engrossed treatments based on peptide for Huntingtin, including both polyglutamine and non-polyQ peptides such as QBP1, P42, ED11, and BIP.By focusing on different areas of the Htt protein, these peptides—QBP1 and P42 in particular—avoid aggregation. P42 ties to residues between 480 and 502, while QBP1 interacts with several locations within the Htt protein's N-terminal section.

Valarmathy K / Afr.J.Bio.Sc. 6(5) (2024). 9525-9533 **ISSN: 2663-2187**

https://doi.org/10.48047/AFJBS.6.5.2024. 9525-9533

AfricanJournalofBiological Sciences

AN EFFICIENT HYBRID FILTERING APPROACH TO IMPROVE THE QUALITY OF MEDICAL IMAGES

Valarmathy K[1], O. Jeba Singh[2],R.Remya[3*],P.Jose[4], G.Dhivyasri[5], M.Manikandan[6]

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doi:*10.48047/AFJBS.6.5.2024. 9525-9533*

Abstract:

Noises in the image results from the scanned image have a serious impact on the final decision made by the Expert. Globally, huge millions of decision made based on the scanned results. This paper focuses on the noise replacement aspect by an image filtering algorithm to perform noise removal automatically. The application has developed based on the fusion of both median and modified Discrete Wavelet Transform (mDWT) filtering algorithm and it is tested on variegated dataset images. Such a de-noised image performance has been analysed by the various performance measures such as Peak Signal to Noise Ratio (PSNR), Normalized Absolute Error (NAE), Structural Context (SC), Normalized Absolute Error (NAE), Structural Similarity Index Measure (SSIM), Normalized Cross correlation (NK) and Maximum Difference (MD). The fused filtering algorithm plays a key role in image processing, since it acts as a pre-processing step.

Keywords: Median Filter, modified DWT filter, MRI images, Rician noise

1. Introduction:

The World Health Organization reported that several millions of people got infected with variegated health issues. In order to identify such issues; initial scanning plays a key role. Such scanning has been performed by MRI, CT, X-ray and fMRI scanning. After scanning, noise replacement plays a crucial role. Since, image has been captured with noise during the image acquisition time. Such noise has to be replaced by an efficient noise replacement algorithm. In the previous literature by Guhathakurta, wavelet gains a greater performance. It utilizes the multi resolution analysis. By using wavelets and wavelet packets, a comparison was made with variegated approaches. Furthermore, a hybrid model by Benabdelkader and Soltani has been utilized in image denoising technique. It estimates the standard deviation for the entire image. It is then utilized for the threshold calculation in the wavelet coefficient shrinkage. Lahmiri and Boukadoum proposed that for filtering first order local statistics (FOLS) and the fourth order PDE were combined. Its performance was evaluated on the images in the presence of Gaussian, salt and pepper, poisson and speckle noise. Rekha and Samundiswary introduced a method called Double density wavelet transform. It is nothing but the combination of the Fast Bilateral Filter (FBF) with double density wavelets. It reduces the noise present in the image which acquires during the image acquisition and it degrades the noise at any levels. Remya et al. proposed a novel thresholding approach utilized in the discrete wavelet transform filtering to denoise the image. It yields better accuracy than the other similar works. To measure the filtering performance, PSNR and SSIM were utilized. Igor proposed in his work that for filtering, fusion of a centre- weighted median filter and block matching 3D filtering technique have been utilized. It removes both impulsive and Gaussian noise.

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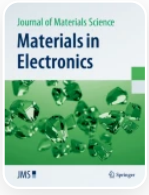
Spectroscopic and non-spectroscopic analysis of Fe-substituted $BaSO_4$ nanoparticles by chemical precipitation method

Published: 01 July 2024

Volume 35, article number 1288, (2024) Cite this article



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P. Soundhirarajan, M. Silambarasan, L. Guganathan, Sandhanasamy Devanesan, Mohamad S. AlSalhi, Ayyar Dinesh, Madhappan Santhamoorthy & Manikandan Ayyar

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Abstract

Nanomaterials are of tremendous interest because of their numerous uses. The preparation technique and impurity added to nanomaterials have a significant impact on their structure and effectiveness. Hence, we have examined the optical properties of $BaSO_4$ nanoparticles doped with Fe-ions. The effect of Fe-ions concentration on the spectroscopic and non-spectroscopic techniques of $BaSO_4$, were investigated thermogravimetric differential

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K. Ramesh, S. Gunavarthini, P. Soundhirarajan, M. Silambarasan, and B. Mehala

Doi: https://doi.org/10.1142/S0219581X23500850

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Abstract

In this work, $Mn_2P_2O_7$ nanoparticles were synthesized via hydrothermal route without any templates or surfactants followed by heat treatment at 700°C. The as-prepared samples were characterized and described using thermogravimetric and differential thermal analysis (TG-DTA), X-ray diffraction (XRD), Fourier transform infrared spectrometer (FT-IR), Scanning electron microscopy (SEM) analysis. The resultant product was evaluated for electrochemical properties in organic electrolyte between −1.4 and 1.6 V using cyclic voltammetry in ambient condition. It revealed the specific capacitance of 565 F/g at scan rate of 5 mV/s. The outstanding pseudocapacitive performance was absorbed due to the faradaic oxidation and reduction reactions related to the intercalation/de-intercalation of the tetrabutylammonium cation (TBA^+) electrolyte and inorganic pyrophosphate lattice. It was believed that the cost effective $Mn_2P_2O_7$ nanoparticles may be promising electrode materials for electrochemical capacitors.

Keywords: $Mn_2P_2O_7$ ▪ hydrothermal ▪ calcination ▪ electrochemical performance ▪ pseudocapacitance

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S. Manimegalai, P. Soundhirarajan, and M. Silambarasan

Doi: https://doi.org/10.1142/S1793292024501583

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Abstract

$CuCo_2O_4$ nanoparticles were synthesized via facile hydrothermal route using oxalic as a precipitant, thermal decomposition of $CuCo_2O_4$ precursor at 400°C. The structural studies from X-ray diffraction (XRD), Fourier transform infrared spectrometer, Raman spectroscopy and X-ray photoelectron spectroscopy (XPS) disclose the predominant spinel crystal phase for copper cobaltite. The optical absorption spectra reveal two band gaps of 3.8 eV and 4.4 eV in the $CuCo_2O_4$ nanoparticles. The cyclic voltammetry (CV) was used to assess the electrochemical characteristics of the resulting product in an organic electrolyte at −1.5–1.5 V under ambient conditions. On 22.4 nm $CuCo_2O_4$ nanoparticles, a greater capacitance of 920 F/g at a scan rate of 5 mV/s was achieved.

Keywords: Spinel $CuCo_2O_4$ ▪ cyclic voltammetry ▪ band gap ▪ specific capacitance ▪ impedance

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Detection of intraerythrocytic stages of malaria parasite using one-dimensional Bragg mirror optical sensor

Research Article Published: 27 February 2024

(2024) Cite this article

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Ranjith B. Gowda, H. N. Gayathri, Regina Mathias, H. C. Shreya, P. N. Veena & R. K. Raju

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Abstract

This research focuses on the construction and analysis of a one-dimensional (1D) Bragg mirror (BM) with a micro-cavity at the centre to identify the *Plasmodium falciparum* parasite, which is the primary cause of malaria. In biomedical applications, early malaria identification is essential. Humans are bitten by female Anopheles mosquitoes, which release the pathogen *Plasmodium falciparum* into the body. Initially invading RBCs, this parasite grows and reproduces inside human red blood cells. *P. falciparum* goes through a number of erythrocytic phases in the infected RBC cells. Using the appropriate diagnostic

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Advances in Functionalized Polymer Nanocomposites

From Synthesis to Applications

Woodhead Publishing Series in Composites Science and Engineering

2024, Pages 959-1000

24 - Functionalized conducting polymer nanocomposites for EMI shielding applications

C.K. Madhusudhan [1], Muhammad Faisal [2], N. Maruthi [2 3], Narasimha Raghavendra [4], K. Mahendra [5], C.H. Abdul Kadar [2 6]

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Abstract

Conducting polymers have gained the greatest interest over the last few decades for their diverse application capacities. Conducting polymer-based nanocomposites are capable of achieving new functionalities for various technologically relevant areas of composite material research. Important and modified functionalities like tunable electrical conductivity, environmental stability, thermal stability, and thermoelectric capabilities, with low cost associated with conducting polymer-based composites make this class of materials in the frontier of materials for advanced applications. Some of the most specific contributed areas of functionalized conducting polymer composites are electromagnetic shielding, conducting adhesives, artificial nerves, electrostatic materials, diodes, transistors, and aircraft structures. This chapter highlights the importance of conducting polymers and functionalized conducting polymer-based composites with their selected applications.

ScienceDirect

Journal of Molecular Structure

Volume 1305, 5 June 2024, 137701

Synthesis, characterization, and photoluminescence investigations of Al/Co-doped ZnO nanopowder

Usha Jinendra [a], Dinesh Bilehal [b] ✉, B.M. Nagabhushana [c], Avvaru Praveen Kumar [d] ✉, Mohd Afzal [e], Chandan Shivamallu [f], Sanjay S Majani [g], Shiva Prasad Kollur [g] ✉

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Highlights

- Co/Al-doped ZnO nanoparticles were synthesized through solution combustion method.
- The structural analysis revealed a hexagonal wurtzite structure of the materials.
- Electromagnetic interference (EMI) shielding effect of synthesized material was investigated.

Abstract

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RESEARCH ARTICLE · Volume 10, Issue 14, e34427, July 30, 2024

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Investigations of adsorption and photoluminescence properties of encapsulated Al–ZnO nanostructures: Synthesis, morphology and dye degradation studies

Usha Jinendra [a] · Sanjay S. Majani [b] · Dinesh Bilehal [c] · … · Muzaffar Iqbal [f] · Chandan Shivamallu [g] · Shiva Prasad Kollur [b] … Show more

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Highlights

- Synthesis of Al-doped ZnO nanoparticles by solution combustion method.
- Narrowed size distribution, a controllable shape, and good crystal quality.
- Al-doped ZnO nanoparticles' UV emission peak location showed greater intensity.

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Abstract

This study focuses on the solution combustion approach to examine the nanostructures of undoped and doped ZnO with different concentrations of Al (0.1 % and 0.2 %). Various physical techniques were utilized to characterize the synthesized nanoparticles. X-ray diffraction (XRD) revealed the crystalline materials, while scanning electron microscopy (SEM) with energy-dispersive X-ray (EDX) findings confirmed the products with particle size and the insertion of Al into the ZnO lattice. Fourier-transform infrared spectra (FTIR) confirmed the presence of different functional groups in the obtained material. The results indicate that Al-doped ZnO (Al–ZnO) nanoparticles show promising properties for optoelectronics and photoluminescence. Photoluminescence analysis indicated that an increase in Al3+ (0.2 %) concentration resulted in a decrease in peak intensity and an increase in the full width at half maximum. The band gap was calculated using the Taucs plot. The study also highlights the effectiveness of Zn1-xAlxO nanostructures in degrading organic pollutants, particularly in adsorbing Malachite Green (MG) dye. Among the samples, the 0.2 % Al-doped ZnO exhibited superior dye degradation efficiency due to its enhanced adsorption capacity and smaller particle size, as evidenced by multilayer adsorption capacity and chemisorption during the degradation process. This study provides valuable insights into the potential applications of Al-doped ZnO nanoparticles in various environmental and technological fields, emphasizing their significance in the degradation of organic pollutants.

Keywords

$Zn_{1-x}Al_xO$ nanostructures · Dye degradation · Photoluminescence studies · Solution combustion method

1 Introduction

Due to its high potential utility in optoelectronics and widespread scientific interest, ZnO has become one of the most heavily investigated metal oxides in recent years. Applications in optoelectronics, nonlinear optics, and electro-optics [1] greatly benefit from the material's high exciton binding energy of 60 meV at room temperature and wide direct band gap of 3.3 eV [2]. Al, a member of group III, easily converts n-type ZnO to p-type ZnO. As an added advantage, ZnO may be used in a number of different. Furthermore, ZnO can be used in various applications, such as gas sensors [3], solar cells [4], and flat panel displays [5]. An obvious advantage of ZnO is that its characteristics can be easily adjusted by manipulating the number of oxygen vacancies within the material. It has been discovered that growth temperature and environment significantly affect ZnO's photoluminescence (PL) characteristics [6]. Stoichiometric ZnO thin films tend to exhibit intense UV fluorescence. Defects such as oxygen interstitials, oxygen vacancies, zinc interstitials, zinc

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Research Published: 04 March 2024

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G. T. Deepa, Usha Jinendra, P. T. Goroji, M. C. Khetagoudar, Mahadev B. Chetti & Dinesh C. Bilehal

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Abstract

In this research, a straightforward sample treatment for multiresidue pesticide evaluation of onion samples was developed using the solid-phase extraction/quick, easy, cheap, effective, rugged, and secure (SPE/QuEChERS) method. The suggested technique is based on acetonitrile liquid-liquid partitioning, then follows dispersive solid-phase extraction with ZrO_2 particles for extract purification. ZrO_2 is synthesized via co precipitation and analyzed via XRD, FTIR, and SEM. ZrO_2 has been demonstrated to be more effective than normal

ScienceDirect

Current Research in Green and Sustainable Chemistry

Volume 8, 2024, 100399

Evaluation of antioxidant and antibacterial activities of silver nanoparticles derived from *Limonia acidissima* L. fruit extract

Azharuddin B. Daphedar [a], Sanjay S. Majani [b], Praveenkumar J. Kaddipudi [c], Raveendra B. Hujaratti [d], Siddappa B. Kakkalmeli [e], Ali A. Shati [f], Mohammad Y. Alfaifi [f], Serag Eldin I. Elbehairi [f], Chandan Shivamallu [g], Usha Jinendra [h], Shiva Prasad Kollur [b]

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Highlights

- AgNPs was synthesized through green chemistry synthetic approach.
- The PXRD, SEM and TEM tools were used to characterize the sample.
- Antioxidant and antimicrobial activities were investigated.
- As-Prepared AgNPs exhibited significant biological potential against tested pathogens.

Abstract

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| Conference paper | First Online: 27 November 2024

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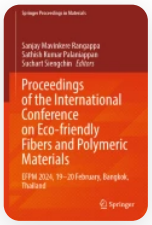

Proceedings of the International Conference on Eco-friendly Fibers and Polymeric Materials

(EFPM 2024)

Edayadulla Naushad, Shanmuga Sundari Chandraraj, Indran Suyambulingam & Divya Divakaran

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Section	Structural Engineering & Concrete Technology
DOI	https://doi.org/10.1051/e3sconf/202455904003
Published online	08 August 2024

E3S Web of Conferences 559, 04003 (2024)

Rice Husk Ash based Sodium Silicate as the Alkali Activator in slag based Geopolymer Concrete

A. Chithambar Ganesh[1*], Hemadri Prasad Raju[2], Leema Margret[3] and Usha Jinendra[4]

[1] Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Chennai, India

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[3] Ramco Institute of Technology, Rajapalayam, India

[4] The Oxford College of Engineering, Bengaluru, India

Abstract

Geopolymer binders have become a cutting-edge, environmentally friendly substance with the potential to replace Portland cement in a variety of applications and potentially cut the carbon footprint of concrete production by up to 80%. Precursors and alkali activator solution are the essential part of geopolymer. Precursor material can be industrial wastes and Ground Granulated Blast Furnace Slag is used in this investigation. However, the requirement of synthetic alkali activator solutions has to be addressed to fully realize the sustainability benefits of geopolymer concrete. In this aspect, an effort has been taken to synthesis sodium silicate solution from the processed rice husk ash using hydrothermal process and utilize the same for the production of geopolymer concrete. The different parameters that influence the properties of synthesized sodium silicate solution such as ratio of sodium hydroxide to rice husk ash, temperature maintained in the hydrothermal process and duration of hydrothermal process was varied and investigated in this study. The ratio of sodium hydroxide to rice husk ash was varied in different proportions such as 1:0.5, 1:1, 1:1.5, 1:2. Temperature was varied as 80, 100, 120 degree Celsius and reaction time was varied as 60, 90, 120, 150 minutes. The geopolymer concrete was tested for setting time, compressive strength, split tensile strength and water absorption capacity. The strategy is thought to have a good chance of significantly lowering the global warming potential of geopolymers. Findings of this study unleash hefty potential in the arena of

Concrete

E3S Web of Conferences 529, 01004 (2024)

Improving the Mechanical Properties of High-Performance Concrete using Alccofine and Glass Powder

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Experimental Study on the Behavior of One Part Geopolymer Concrete Using Natural Binders and Activators

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Annals of Pure and Applied Mathematics
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DOI: http://dx.doi.org/10.22457/apam.v29n1a05930

The Status Gourava Indices of Middle Graphs of Some Standard Graphs

***Selastina Mary*[1*] and *Mallikarjun B Kattimani*[2]**

[1,2] The Oxford College of Engineering, Bangalore-560068, India
[1*]Corresponding Author: mallikarjunbk64@gmail.com

Received 2 January 2024; accepted 10 February 2024

Abstract. The sum of the shortest distance between a vertex u from all other vertices of a graph G is called the status of the vertex u and is denoted by $\sigma(u)$. In this article, we have found the precise formula for the derived graphs of a few standard graphs. We have obtained Status Gourava indices of middle graphs of some standard graphs namely cycle graph, star graph, complete graph, wheel graph and friendship graph. We have calculated ten standard status indices of middle graphs of standard graphs using this new index.

Keywords: Graphs, Gourava index, Degree-based topological index.

AMS Mathematics Subject Classification (2010): 05C31

1. Introduction

Every graph that is taken into consideration here is finite, nontrivial, undirected, free of loops and multiple edges, and without isolated vertices. For words or notations that are not defined in this work, found in Harary [1]. Vertex set is denoted by $V(G)$, edge set is denoted by $E(G)$ for a graph G. The middle graph M(G) is represented by the graph G, from which a new vertex is inserted into each edge of G, and edges are drawn between these new vertices which lie on adjacent edges of G. The length of the shortest path between two vertices u and v, denoted by $d(u,v)$ is the distance between them. The sum of distances of a vertex u from all other vertices of a graph is called the status of the vertex u with notation $\sigma(u)$. Kulli introduced some new status indices of the graph. The $(a,b)-$ status index, as

$$S_{a,b} = \sum_{uv \in E(G)} \{(\sigma(u))^a \cdot (\sigma(v))^b + (\sigma(u))^b \cdot (\sigma(v))^a\}$$

.

Kulli introduced status Gourava indices of the graph. For notations and definitions, we refer [1, 5] and [6]. Kulli et al. have found the first status index $S_1(G)$, second status index $S_2(G)$, product connectivity status index $PS(G)$, reciprocal product connectivity status index $RPS(G)$, the general second status index $S_2^a(G)$, the first status Gourava index $SGO_1(G)$, the second status Gourava index $SGO_2(G)$, of middle graphs of some standard graphs namely cycle graph, star graph, complete graph, wheel graph and friendship graph.

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M-Polynomial and Topological Indices of Derived Graphs of Ladder Graph

February 2024
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Abstract and Figures

The M-polynomial is the source of finding information about degree-based topological indices of a molecule. This polynomial will help us to predict the different properties like physiochemical properties, chemical reactivity, biological activities etc. of the chemical compounds. In this article, we establish an M-polynomial for derived graphs of Ladder graphs namely slanting ladder graph, Diagonal ladder graph and Open diagonal ladder graph. The ladder graph is an undirected connected graph with 2 vertices and 3 1 edges. Also, we determine some standard degree-based topological indices for the M-polynomial of derived graphs.

Slanting ladder graph Theorem…

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Abstract

The combined heat and mass transfer, the so-called thermosolutal convective problem, has become an attractive field of research in many diversified areas. In this paper, for the first time, oscillatory flow analysis has been carried out for triple diffusive viscoelastic fluid flow in a porous medium. A comprehensive model is developed for the modified Darcy–Brinkman–Oldroyd-B fluid, porous medium, Boussinesq approximation, heat and mass transfer across a finite temperature and concentration difference in the chemical potential of two salts. Triple diffusive viscoelastic fluid flows through porous media have grown significantly as this situation occurs in more than a few applications such as improved oil recovery filtration, liquid complex molding, solidification of liquid crystals, cooling of metallic plate in a bath, exotic lubricants and colloidal solutions, polymer processing, chemical and bioengineering industries, among others. The governing coupled nonlinear partial differential equations with boundary constraints represent the modeled flow problem. In addition, these equations are converted into non-dimensional form by employing suitable non-dimensionalizing quantities. The impacts of the pertinent parameters and related dimensionless numbers on the dimensionless velocity, temperature, concentrations, shear stress, heat and mass transfer are examined for both suction and injection cases. It has been found that when the injection level on the heated plate is increased, the shear rate increases for each channel plate. Furthermore, we recognized that the viscoelastic parameters exhibit an opposite kind of behavior on the velocity, temperature, and concentrations fields.

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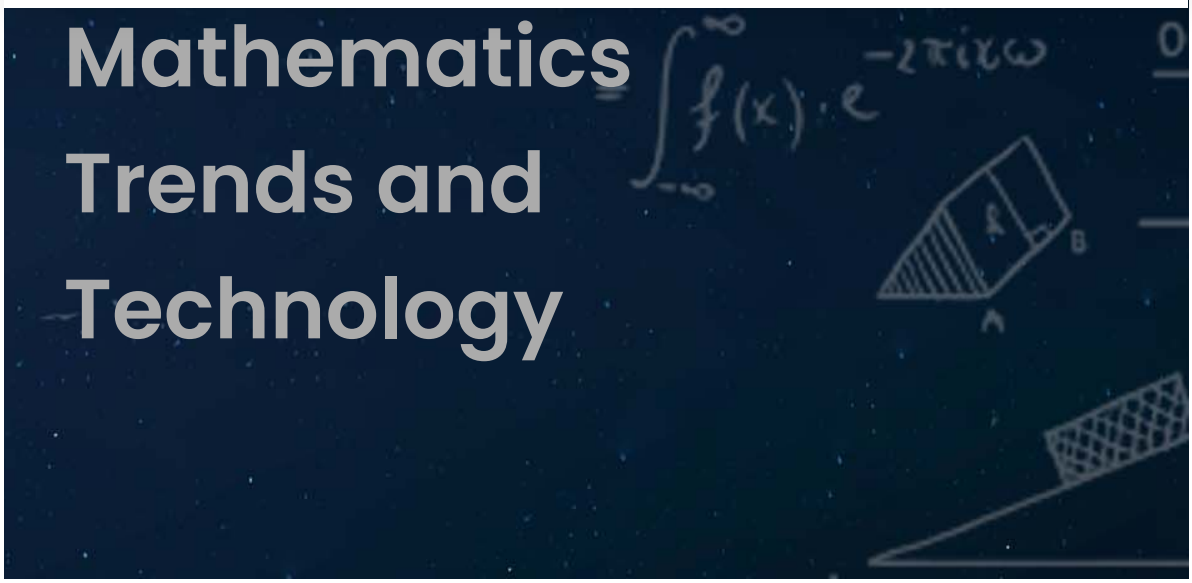

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The Accurate Degree Domination Number of a Graph

Moumita K. Chatterjee, Mallikarjun B. Kattimani, Pavitra P. Kumbargoudra

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20 Mar 2024	25 Apr 2024	13 May 2024	26 May 2024

Abstract

Consider a graph $G(V, E)$ and a dominating set Dk, the degree of a dominating set Dk is the sum of the degree of all the vertices in Dk and is written as $deg(Dk)$. The degree of the set is the sum of the degrees of all the vertices of the set. The minimum degree among all the dominating sets is called the degree dominating set and is written as Di . Now, a dominating set Di is an accurate degree dominating set if $V - Di$ has no degree dominating set of the cardinality of Di . The

Abstract Keywords References Citati

Simulation of Hemoglobin and Oxyhemoglobin Dynamics Using a Robust Computational Technique

(https://internationalpubls.com/index.php/cana/issue/view/56)

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Keywords:
hemoglobin, oxyhemoglobin, SpO2, runge-Kutta method

R. Kasthuri, K. Mythili Gnanapriya, C. Gayathri, S. Girija, K. Kavithamani, R. Shanmugapriya, S. Ranganayaki, P. Vasanthi, N. Jeeva Prakash, L. Shruthika

Abstract

In this study a robust computational technique is used for a better understand of the dynamics of hemoglobin and oxyhemoglobin in human blood.[1] Results obtained using this technique helps to calculate SpO2 levels. The major goal of this research is to create a mathematical model that can explain how the concentrations of hemoglobin and oxyhemoglobin change over time. A graphical representation has been arrived with the solution of the proposed model using R-K method and MATLAB tool.

Issue

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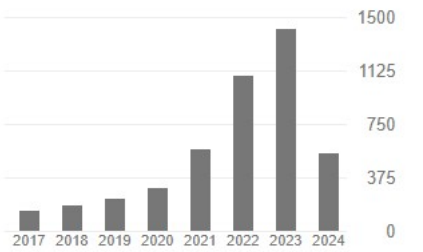

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Description

BALANCING WORK & LIFE TO REDUCE DOCTORS STRESS

Dr.P.A. Satya Vardhini, Research Scholar, VTU Research Centre, Department of Management Studies, The Oxford College of Engineering, Bengaluru.

Dr.K. Tharaka Rami Reddy, Professor& Head, Department of Management Studies, The Oxford College of Engineering, Bengaluru.

ABSTRACT:

It can be exceedingly difficult for women doctors to maintain a healthy work-life- balance because they are more stressed compared to those in other professions. The number of female doctors is rapidly growing in corporate and government hospitals. Heavy job stress causes tension frequently, yet for the situation to turn out well, work-life- balance is essential and it intimately intertwined act of delicate balance between one's personal and professional trajectories. Their employment involves several challenges, including night shifts, extended shifts, shorter breaks, and intense work pressure. The research was conducted to shed light on the challenges faced by women doctors and to close a gap in our understanding of the work-life balance issues that these women face. Women doctors are more likely to work hard and provide excellent treatment when they are surrounded by a positive work and home culture. Therefore, it's important to examine ways to help female doctors to achieve a better work-life balance by identifying the numerous elements that stress out their lifestyles, in hospital setting. The research report is based on secondary data gathered from already published literature reviews, current research papers, surveys, websites, blogs, and articles. The methodology used in the study is conceptual and descriptive. According to the results, work-life harmony of women doctors is affected by both personal and professional sources of stress. In addition to highlighting several research gaps in the stress sector, the paper included numerous suggestions to aid in achieving a better work-life balance for women doctors.

Keywords: personal life, professional life, stress, women doctors, work-life-balance.

Studies on Seasonal Variation of Groundwater Quality in the Suddagedda Basin, Eastgodavari District, A.P.

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A Comparative Study of BSE Listed Sectoral Indices of Real Estate and Banking Industry

International Journal of Case Studies in Business, IT, and Education (IJCSBE), 8(1), 272-291. ISSN: 2581-6942. (2023).

14 Pages
Posted: 25 Apr 2024

Venkata Lakshmi Suneetha M. (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=6606302)
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P. S. Aithal (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=2519140)
Poornaprajna College

Date Written: December 31, 2023

Abstract

Purpose: Shareholders are the real owners of the company. They provide capital to the business to get a better return on their investment. Maximizing shareholder wealth has become the primary goal of today's business world. No business entity can become profitable without producing a lot for various investors. There are some strategies to determine the organization productivity and valuation of investors. A cutting-edge form of top management, economic value added (EVA) is a way of valuing shareholder wealth. This helps ensure the true productivity of the organization at the expense of value and capital. The concept was first created by Stern Stewart and Co. The company proposed 164 changes in GAAP rules to calculate real economic profit and some changes in economic capital. MVA is another modern way of valuing shareholder wealth. It describes how efficiently a company uses shareholders' assets. The study made two corrections to the calculation of economic benefit and two corrections to the related population. Real estate and banking companies listed on the Bombay Stock Exchange were selected for the study. The purpose of the audit was to determine the value of investors in BSE-listed land and bank units based on EVA and MVA over a period of five years. Speculations were tested using ANOVA and T-TEST. The audit revealed that an organization like Legend Engine Corp expanded its EVA and MVA during this period.

Design/Methodology/Approach: Five BSE listed industries are considered for the present research work and analysed by using EVA and MVA.

Findings/Result: A profitable sector is identified. Opportunity is provided for the investors to buy, sell, or hold the stock to generate more profits in the selected sector. It has been observed that SBI has a high typical EVA unlike various banks but it has decreased in the long run. All financial organizations have a positive relationship between EVA and MVA.

Originality/Value: Among the organizations in the selected countries, Godrej Properties, and DLF are positively associated with MVA and investment wealth creation every 5 years. Choosing stocks from an industry is a big problem for investors because the market is unpredictable and offers more opportunities for traders and investors to buy sell or hold stocks and earn potential profits in the market. This study aims to compare EVA and MVA to provide some recommendations for stock and industry selection to all investors.

Keywords: EVA, MVA, Shareholder's Value, NOPAT, WACC, Capital Employed.

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A Study on Effect of Job Satisfaction, Stress and Emotional Intelligence on Job Performance among HEI Faculty Members

Authors

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Sahana Achyutha

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A Sectoral Analysis of BSE-Listed Indian Pharma Companies

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PDF (https://www.supublication.com/index.php/ijcsbe/article/view/1152/888)

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DOI: https://doi.org/10.47992/IJCSBE.2581.6942.0346 (https://doi.org/10.47992/IJCSBE.2581.6942.0346)

Keywords:
EPS, DPS, Investment attractiveness, Shareholder value creation

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Abstract

Purpose: *Investors, including domestic and international firms, venture capitalists, and financial institutions, rely on research to evaluate investment opportunities in the Indian pharmaceutical sector. Research helps assess factors such as market potential, company performance, R&D capabilities, regulatory environment, and risk-return profiles. Research plays a crucial role in guiding research and development (R&D) investments and priorities within the Indian pharmaceutical industry. By identifying unmet medical needs, emerging therapeutic areas, and technological advancements, research helps companies allocate resources effectively and focus on areas with the highest potential for impact and return on investment. The current research includes analysing financial statements, such as income statements and cash flow statements, to assess the profitability and earnings stability of pharmaceutical firms, and also investigate factors influencing EPS growth, such as revenue trends, cost structures, research and development (R&D) investments, regulatory environments, and market dynamics. Additionally, the study of DPS involves evaluating dividend payout ratios, dividend yield, dividend stability, and factors driving dividend decisions, including company profitability, cash flow generation, capital requirements, and shareholder preferences. Understanding the relationship between EPS and DPS in the Indian pharmaceutical sector provides valuable insights for investors, analysts, and policymakers in assessing the financial health, investment attractiveness, and shareholder value creation of pharmaceutical companies. Pharmaceutical companies listed on the Bombay Stock Exchange were selected for the study. Speculations were tested using ANOVA and T-TEST. The audit revealed that investors can invest in Dr. Reddys Laboratories, Abbott India, and Themis Medicare for their EPS to be maximum and Dr. Reddys Laboratories, Abbott India, and Novartis India for their DPS to be maximum.*

Methodology: *Fifteen BSE-listed pharmaceutical companies are considered for the present research work and analysed by using EPS and DPS.*

Result: *Selected Large, medium, and small Indian pharmaceutical companies listed on the BSE were the subjects of this study's analysis of their EPS and DPS. The websites of Money Control and the BSE provided the majority of the time series data used in the study on two different variables, EPS and DPS. Five years, from 2019 to 2020 to 2022–2023 are included in the analysis of the EPS and DPS. The BSE-listed Indian pharmaceutical businesses' EPS and DPS were examined in this study. Descriptive statistics (mean, standard error, standard deviation, skewness,*

A Financial Performance Analysis of Indian Oil Exploration & Drilling Sector

(https://supublication.com/index.php/ijaeml/issue/view/69)

PDF (https://supublication.com/index.php/ijaeml/article/view/1163/893)

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DOI: https://doi.org/10.47992/IJAEML.2581.7000.0220 (https://doi.org/10.47992/IJAEML.2581.7000.0220)

Keywords:
Profitability, Liquidity and Valuation ratios, Financial Performance, overall stability, growth potential, risk exposure

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Abstract

Purpose: *The study of financial performance analysis in the Indian oil and drilling sector serves a critical purpose in providing stakeholders with insights into the economic health, operational efficiency, and strategic positioning of companies within this industry. By analysing key financial metrics such as profitability, liquidity and valuation ratios, stakeholders including investors, policymakers, and industry participants can assess the sector's overall stability, growth potential, and risk exposure. Moreover, such analysis facilitates informed decision-making processes related to investment allocation, risk management strategies, policy formulation, and strategic planning. Understanding the financial performance of companies within the Indian oil and drilling sector is imperative for stakeholders to navigate the complexities of this dynamic industry, capitalize on opportunities, and mitigate potential challenges effectively. Oil Exploration and Drilling companies listed on the Bombay Stock Exchange were selected for the study.*

Design/Methodology/Approach: *Five BSE listed Oil Exploration and Drilling companies are considered for the present research work and analysed by using profitability, liquidity and valuation ratios.*

Findings/Result: *Selected Oil Exploration & Drilling sector companies listed on the BSE were the subjects of this study's analysis of their Profitability, Liquidity & Valuation ratios. The websites of Money Control and the BSE provided the majority of the time series data used in the study on three different ratios, Profitability, Liquidity & Valuation. Five years, from 2019 to 2020 to 2022–2023 are included in the analysis of Profitability, Liquidity & Valuation. It is recommended that investors can invest their money into ONGC, Reliance, and Oil India, Petronet LNG LTD. in order to maximise their investments.*

Originality/Value: This study employs the financial analysis method to analyze profitability, liquidity and valuation of the selected Oil Exploration & Drilling Sector.

Quantitative ABCD Analysis: Indian Household and Personal Care Sector

(https://www.supublication.com/index.php/ijcsbe/issue/view/74)

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DOI: https://doi.org/10.47992/IJCSBE.2581.6942.0355 (https://doi.org/10.47992/IJCSBE.2581.6942.0355)

Keywords:
Indian household and personal care sector, Quantitative ABCD Analysis, ABCD Analysis Framework, Determinant issues, Key attributes

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Abstract

Purpose: *The study aims to examine Indian Household and Personal care sector using the ABCD analytical methodology. It uses factor analysis and elementary analysis to evaluate some of the benefits, drawbacks, limitations, and advantages of the Indian Household and Personal care sector, offering a thorough grasp of the problems and their possible advantages.*

Methodology: *Exploratory: The exploratory research method is used where the relevant information are collected through keyword-based search using search engines like Google, Google Scholar, and AI-driven GPTs and analysed, compared, and evaluated using suitable analysing frameworks. The results are interpreted as new knowledge obtained from this research and suggested in the form of outcome postulates.*

Findings/Result: *The ABCD analytical approach indicates that both organizations and individuals are utilizing sustainable strategies to tackle pressing issues. By examining the Indian household and personal care sector, stakeholders can contribute to its growth, competitiveness, and societal impact, while ensuring responsible business practices and sustainable development.*

Originality/Value: *This study employs the ABCD analysis method to analyse the Indian household and personal care sector. The study explores the sector's dynamics, market trends, consumer preferences, and regulatory landscape enabling businesses to develop effective strategies for product development, branding, distribution, and marketing through determinant issues and key attributes.*

Paper Type: *Empirical Analysis*

How to Cite

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Unlocking Potential in the Chemical Industry Sector: An Innovative SWOT Analysis Study

(https://supublication.com/index.php/ijcsbe/issue/view/74)

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Keywords:
Chemical industry sector, SWOT Analysis, Innovation, Technological Advancements, Market Dynamics, Emerging Markets, Sustainable Practices, Strategic Decision-making.

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Abstract

Purpose: *The chemical industry sector stands at a pivotal juncture, with rapid technological advancements and evolving market dynamics driving the need for innovative strategies. This study aims to unlock the untapped potential within the chemical industry by employing a unique SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis approach.*

Design/Methodology/Approach: *A comprehensive SWOT analysis was conducted using a mixed-methods approach. Quantitative data was gathered through industry reports, market surveys, and financial analyses, while qualitative insights were derived from expert interviews and case studies.*

Findings/Result: *The SWOT analysis revealed significant insights into the current state of the chemical sector. Strengths such as technological innovation and research capabilities were identified, along with weaknesses like regulatory challenges and environmental concerns. Opportunities in emerging markets and sustainable practices were highlighted, while threats including global competition and supply chain disruptions were also recognized.*

Originality/Value: *This study offers a fresh perspective on the chemical industry's potential by combining traditional SWOT analysis with innovative methodologies. It provides actionable insights that industry stakeholders can leverage to drive strategic decision-making and unlock new growth opportunities.*

Paper Type: *Empirical Study*

How to Cite

Revving Up or Stalling Out? A Comprehensive SWOC Analysis of BSE listed India's Auto Sector

(https://supublication.com/index.php/ijmts/issue/view/75)

PDF (https://supublication.com/index.php/ijmts/article/view/1222/926)

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Keywords:
SWOC analysis, Indian auto industry, strengths, weaknesses, opportunities, challenges, qualitative research, industry analysis

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Abstract

Purpose: *The primary purpose of this research paper is to conduct a comprehensive SWOC (Strengths, Weaknesses, Opportunities, and Challenges) analysis of the Indian automobile sector, which plays a vital role in the economy by contributing to GDP, employment, and technological progress. Amidst globalization, technological changes, and evolving consumer preferences, the industry faces numerous internal and external factors affecting its performance. By systematically evaluating these factors, the research aims to provide insights into the sector's current state and future prospects, informing strategic decisions for stakeholders, policymakers, and investors. This study fills a gap in existing literature by offering a holistic assessment using the SWOC framework, uncovering strengths, weaknesses, opportunities, and challenges to support the industry's competitiveness and sustainability.*

Design/Methodology/Approach: *The study employs a qualitative research approach, utilizing both primary and secondary data sources. Primary data includes industry reports, company publications, and expert interviews, while secondary data encompasses academic journals, government publications, and reputable online sources. SWOC analysis is conducted to identify and evaluate the internal strengths and weaknesses of the industry, as well as external opportunities and challenges it faces.*

Findings/Results: *The SWOC analysis reveals several key insights into the Indian auto industry. Strengths such as a skilled workforce and a growing domestic market are counterbalanced by weaknesses such as infrastructure bottlenecks and regulatory challenges. Opportunities arising from technological advancements and export potential are tempered by threats such as global competition and changing consumer preferences.*

Originality/Value: *This research contributes to the existing literature by offering a comprehensive assessment of the Indian auto industry through the SWOC framework. By synthesizing insights from various data sources, the paper provides valuable insights for industry stakeholders, policymakers, and investors seeking to navigate the complexities of the Indian automotive landscape.*

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Abstract:
Several of the current procedures for detecting cancer, such as mammography, ultrasound, MRI, and biopsy, are either expensive, painful, intrusive, or have limitations in accuracy and sensitivity. As a result, there is a need for a simple, noninvasive, and cost-effective tool for detecting cancer at an early stage. Fiber Bragg grating (FBG) sensors offer a wide range of uses in primary care and biomedical applications for intelligent sensing. Furthermore, fiber-optic FBGs have several benefits that set them apart. The most noteworthy of these applications, of course, are incredibly valuable human health indicators such as blood pressure, heart rate, and body temperature. Temperature and blood pressure vary depending on a person's physical, involuntary, nervous, and mental state. Therefore, measuring vital parameters, especially temperature can help in the early identification of symptoms of a disease. Research suggests that temperature variation is observed in cancerous cells (breast, cervix, and blood vessels). FBGs can be utilized as thermal sensors to measure temperature changes with great sensitivity and precision. FBG sensors also face some challenges, such as low signal-to-noise ratio, cross-sensitivity, and environmental interference. Therefore, optimizing the Q factor of FBG sensors is crucial for improving their performance and reliability for cancer identification. In the current study, an optimized FBG sensor was designed and simulated. The average Q-factor obtained in 244.26.

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