



CHILDREN'S EDUCATION SOCIETY (Regd.)

Administrative Office:

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THE OXFORD COLLEGE OF ENGINEERING

(Recognized by the Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi,

Approved by A.I.C.T.E. New Delhi & Recognized by UGC Under Section 2(f),

Accredited by NBA, New Delhi, NAAC 'A' Grade with score of 3.24 & Diamond Rating by QS I Gauge)

Bommanahalli, Hosur Road, Bengaluru –560 068. ☎: 080 -61754601/602

E-mail: engprincipal@theoxford.edu Web: www.theoxfordengg.org

The Oxford College of Engineering is committed to nurturing a culture of research and innovation. With a dedicated and well-established Research and Development (R&D) team, led by the Dean of R&D, the institution actively promotes research initiatives across various departments. In line with this, the college has implemented a comprehensive Research Promotion Policy, designed to foster an environment conducive to research. This policy offers clear guidelines for faculty members and students, encouraging them to pursue projects aligned with their academic interests. It also outlines the procedures for securing funding, publishing research papers, and filing patents.

At present, the institution is engaged in multiple research projects across its departments, each with the potential to advance to higher stages of Technology Readiness Level (TRL). These projects encompass activities such as prototype development, intellectual property rights (IPR) filing, product development, and research publication.

The Department of Biotechnology has been particularly active in research and development. Two noteworthy innovations from this department are Petrozap and Ayur Aqua, both of which have reached TRL 7 and are recommended for commercialization. Petrozap is a novel biotechnological solution for efficient petroleum remediation, while Ayur Aqua offers an innovative approach to water purification grounded in Ayurvedic principles. Additionally, the department has developed an Integrated Bioreactor for Efficient Remediation of Industrial Effluents, which has also reached TRL 7 and is recommended for patenting. This bioreactor integrates multiple techniques for the efficient remediation of industrial effluents. Another breakthrough, Allspice-Based Herbal Toothpaste and Mouthwash, has reached TRL 7 and is likewise recommended for patenting. This product harnesses the antimicrobial properties of allspice for the development of herbal oral care products.

The Department of Electronics and Communication Engineering (ECE) has made significant strides in research and development as well. Among its notable innovations is the Foot Load Health Monitoring Footwear, which has reached TRL 4 and is recommended for productization. This innovative footwear provides health monitoring capabilities by tracking foot load. Another promising development from the department is the Hand Gloves for Rheumatic Arthritis, which has

also reached TRL 4 and is recommended for journal publication. This device measures handgrip pressure, which can be used to diagnose and monitor various health conditions. In collaboration with The Oxford Dental College, the ECE department has developed a Rugae Pattern Recognition App, which utilizes artificial intelligence and machine learning algorithms to analyze and identify unique rugae patterns found on the surface of the palate.

Moreover, in partnership with the Department of Mechanical Engineering, the Department of ECE has developed a Mechanical Bite Force Measurement Device. This device, designed to accurately measure bite force for dental applications, has reached TRL 4 and is recommended for productization. It exemplifies the mechanical engineering aspects involved in creating such a specialized device.

The Department of Computer Science and Engineering has contributed innovative solutions like the Smart Shoe for Diabetic Patients, which has reached TRL 4 and is recommended for patenting. This smart shoe monitors foot health and alerts diabetic patients to potential issues. Another notable project is the Railway Fault Detection and Animal Recognition System, which uses IoT and machine learning technologies to detect railway faults and identify animals, enhancing railway safety. This project has also achieved TRL 4 and is recommended for patenting.

The Department of Information Science and Engineering has developed a Rescue Robot for Borewell, which has reached TRL 4 and is recommended for journal publication. This robot is designed to rescue individuals trapped in borewells, providing a crucial tool in emergency situations. Additionally, the department has introduced a Solar Wireless Electric Vehicle Charging System, which also holds a TRL of 4 and is recommended for journal publication. This innovative system uses solar power to wirelessly charge electric vehicles, promoting sustainability in transportation.


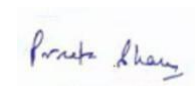
In summary, The Oxford College of Engineering is making remarkable progress in a variety of research domains, with numerous projects showing great promise for commercialization, patenting, and publication, contributing to both technological advancement and societal impact.

- ❖ The academic year 2023-24 has been a remarkable year for The Oxford College of Engineering, marked by significant strides in research and innovation. The institution's commitment to advancing knowledge and technological solutions has yielded impressive results, showcasing its dedication to academic excellence.

One of the notable achievements is the publication of 88 research papers and 21 book chapters and 14 conference. This significant output reflects the institution's dedication to contributing valuable insights to the academic and scientific community. The research papers and book chapters cover a wide range of topics, demonstrating the institution's expertise in various fields of science and engineering.

- ❖ The institution has also received prestigious accolades, including the ITU Kaleidoscope First Prize on Best Paper Award for "Smart Cup Tilt Monitoring." This recognition underscores the institution's research excellence and its potential to develop innovative solutions with real-world applications.
- ❖ The research scholar community at The Oxford College of Engineering has also witnessed significant growth. The number of research scholars has increased from 34 to 39, signifying a thriving research ecosystem that fosters intellectual growth and collaborative exploration. This growth demonstrates the institution's commitment to providing a supportive environment for research scholars to pursue their academic goals.
- ❖ In addition, multiple innovative projects from The Oxford College of Engineering have been nominated for the IIC Yukti Innovation Challenge. This recognition demonstrates the institution's prowess in developing cutting-edge solutions with real-world applications. The innovative projects showcase the institution's expertise in various fields, including engineering, technology, and sciences.
- ❖ Finally, the institution has witnessed an upsurge in research funding from various agencies and a heightened number of patents granted. This underscores the practical implications and commercial viability of the research endeavors at The Oxford College of Engineering. The increased research funding and patents demonstrate the institution's commitment to translating research into innovative solutions that can benefit society.

Dean Research



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The Oxford College of Engineering
Bommanahalli, Hosur Road
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LIST OF POTENTIAL INNOVATIONS

Sl.No	Name of the innovation	Department	TRL Level	Recommendation
1	Petrozap	Biotechnology	7	Recommended for commercialization
2	Ayur Aqua	Biotechnology	7	Recommended for commercialization
3	Integrated Bioreactor for Efficient Remediation of Industrial Effluents	Biotechnology	7	Recommended for Patent
4	Allspice-Based Herbal Toothpaste and Mouthwash	Biotechnology	7	Recommended for Patent
5	Foot Load Health Monitoring Footwear	Electronics and Communication	4	Recommended for productization
6	Hand Gloves for Rheumatic Arthritis	Electronics and Communication	4	Recommended for journal productization
7	Rugae Pattern Recognition App	Electronics and Communication	4	Recommended for patent
8	Mechanical Bite Fore Measurement Device	Electronics and Communication and Mechanical Engineering	4	Recommended for productization
9	Smart Shoe for Diabetic Patient	Computer Science Engineering	4	Recommended for Patent
10	Railway fault Detection and Animal Recognition using IoT and machine Learning	Computer Science Engineering	4	Recommended for patent
11	Rescue Robot for Borewell	Information Science Engineering	4	Recommended for journal publication
12	Solar Wireless Electric Vehicle Charging System	Information Science Engineering	4	Recommended for journal publication

Dean Research

Purnima Shetty

Principal

Anil Kumar
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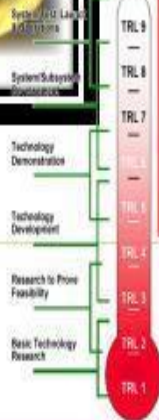
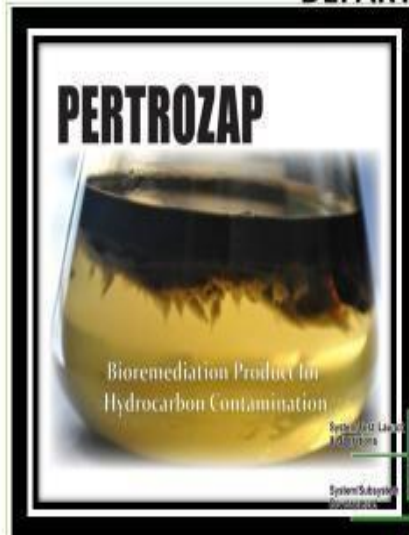
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DEPARTMENT OF BIOTECHNOLOGY

INNOVATION FOR SUSTAINABLE ENVIRONMENT



Product Name: **PETROZAP**

Patent detail : **201741042005/412851/Validity-23/11/2017-23/11/2037**

Field of application: **Bioremediation**

End Users: **Oil Refineries, Petrochemical based Industries, Automobile industry etc.,**

Impact on environment: **Green Technology**

Financial Feasibility: **Cost effective**

Marketability: **Only one product in Indian Market-OILZAPPER from TERI Mumbai**

Distinctiveness: **It is the only product with single organism Fungi based.**

Potent customers: **ONGC, HPL, Reliance Petrochemicals, Oil Refineries, Petrochemical based Industries, Automobile industry etc.,**

Status of the Product: **TRL-7**

Financial Support: **DRDO-NRB & DBT-BIRAC**

IMPACT OF EMR GRANT ON INNOVATION



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DEPARTMENT OF BIOTECHNOLOGY



Product Name: **Ayur Aqua**

Patent detail :

Field of application; **Herbal water**

Impact on environment: **Green Technology**

Financial Feasibility: **Cost effective**

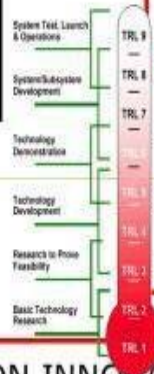
Marketability: **Only few product with high price**

Distinctiveness: **Flavored with herb having high antimicrobial and antioxidant nature with smooth pleasant flavor**

Potent customers: **All Hotels and General Public**

Status of the Product: **TRL-7**

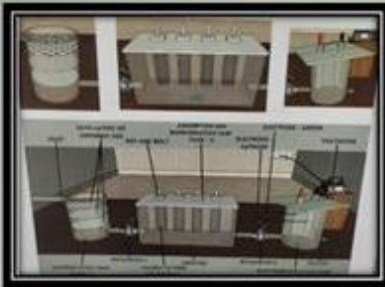
Financial Support: **VGST-KFIST**



IMPACT OF EMR GRANT ON INNOVATION

DEPARTMENT OF BIOTECHNOLOGY

DESIGN OF INTEGRATED BIOREACTOR



Title of the Prototype: Integrated Bioreactor for Efficient Remediation of Industrial Effluents

Branch: Environmental Engineering

Theme: Newer techniques in treating domestic sewage/industrial effluents

End Users: Environmental engineers, wastewater treatment plants, and industries dealing with effluents.

Impact on the Environment: Significant reduction in water pollution and improved water quality, which directly impacts local ecosystems.

Financial Feasibility: Economical and sustainable solution reducing operational costs in treating industrial effluents.

Distinctiveness: The integrated bioreactor employs a novel combination of sedimentation, adsorption, bioremediation, and electro remediation in a singular system.

Status of the Product: TRL-7 in IIC.

Financial Support: Supported by the Karnataka State Council For Science And Technology.



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DEPARTMENT OF BIOTECHNOLOGY

Herbal Toothpaste and Herbal Mouthwash



Title of the Prototype: Allspice-Based Herbal Toothpaste and Mouthwash

Branch: Biotechnology

Theme: Innovation in Oral Healthcare

End Users: Individuals seeking natural and effective oral hygiene products

Impact on environment: Promotes sustainable oral care practices by utilizing natural ingredients

Financial Feasibility: Cost-effective alternative to conventional toothpaste and mouthwashes

Distinctiveness: Harnessing the antimicrobial properties of Allspice essential oil to combat plaque formation and promote oral health. Natural and herbal formulation, free from harsh chemicals. Potential long-term oral health benefits beyond regular hygiene

Status of the Product: TRL-3

Financial Support: Karnataka State Council For Science And Technology (KSCST)



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DEPARTMENT OF BIOTECHNOLOGY

INNOVATION FOR SOCIETAL NEEDS



The Institution aims at providing technology based solution to address the needs of the society-Bengaluru rural districts main occupation is silk rearing where workers face difficulty in processing silk cocoons. To address this issue we developed a cost effective, reliable robotic arm in association with Central Silk Board, Bommanahalli, Bengaluru



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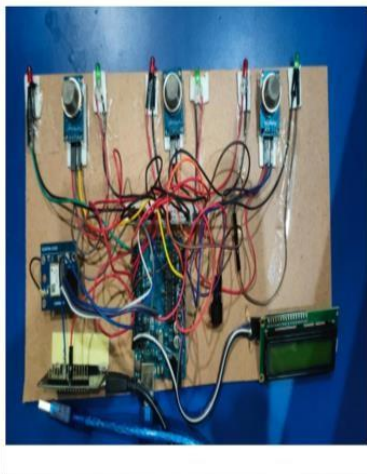
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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

PROTOTYPE FOR ENVIRONMENTAL MONITORING



Title of the Prototype: Locating and Detecting toxic gases in manholes

Branch: Computer Science and Engineering

Theme (as per KSCST poster): Newer techniques in treating domestic sewage/industrial effluents

End Users: The social workers to detect the gas levels and send the details of infected manholes to the government.

Impact on environment: Environmental Monitoring

Financial Feasibility: Cost effective

Distinctiveness: IoT based high-performance monitoring system that works efficiently and safely.

Status of the Product: TRL-2 in IIC

Financial Support: Karnataka State Council For Science And Technology



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DEPARTMENT OF ECE

Name of the Product: Foot load health monitoring footwear
This is a patented Prototype



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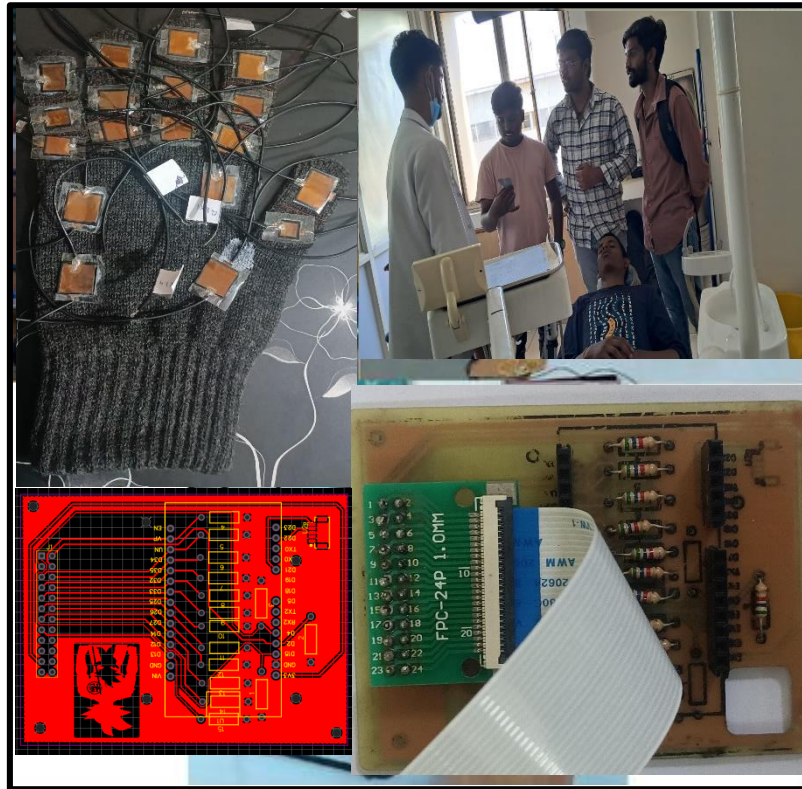
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DEPARTMENT OF ECE

Hand Gloves for Rheumatic Arthritis



Department of E&C Engineering, The Oxford College of Engineering in collaboration with The Oxford College of Physiotherapy designed device to measure pressure on the palm of the human hand, enabling doctors to assess hand strength accurately. Its portability and cost-effectiveness make it a valuable tool for this purpose. The device consists of a hand glove with fsr sensors and component with controller, an integrated sensor in the PCB.



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Department of ECE

Rugae Patter Recognition App



A Rugae Pattern Recognition App would utilize artificial intelligence and machine learning algorithms to analyze and identify unique rugae patterns, which are the ridges and grooves found on the surface of the palate.



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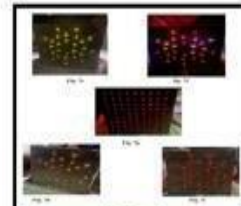




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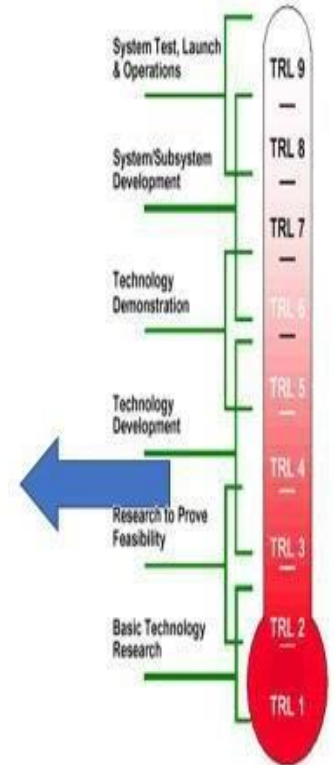
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DEPARTMENT OF ECE Glimpses of Potential Scalable Innovations

		
Garbage Collector	Smart irrigation system	Intelligent Street Light Monitoring system
		
A Cloud based automatic street lighting system for Attibele rural areas and industrial areas	Light transmitting Concrete	3D printer-based Denture model
		
3D printed human tooth	Design and fabrication of carbon dioxide recovery system for domestic and automobile applications	3D printer-based Denture model





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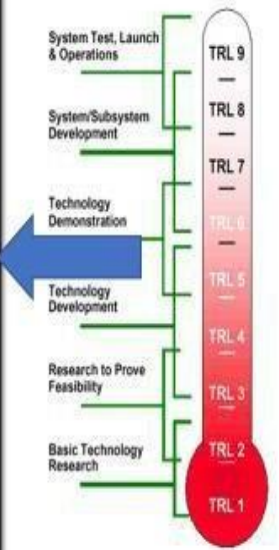
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DEPARTMENT OF ECE

Glimpses of Potential Scalable Innovations

<p>"Wireless mouse and keyboard for handicapped" Funded By ICMR, New Delhi – Dept of E&C Engineering</p>	<p>Handgrip Muscle strength Monitoring System" funded by VGST – Dept of E&C Engineering</p>	<p>3D printed Bionic Hand funded by VGST- Dept of E&C Engineering</p>
<p>"Railway Health Monitoring System " funded by AICTE RPS – Dept of E&C Engineering</p>	<p>A Cloud based automatic street lighting system for Attibele rural areas and industrial areas funded by VGST / RGS-F Scheme – Dept of CSE</p>	<p>Real time pressure monitoring system using FBG sensor for sports and rehabilitation applications funded by VGST – Dept of E&C Engineering</p>





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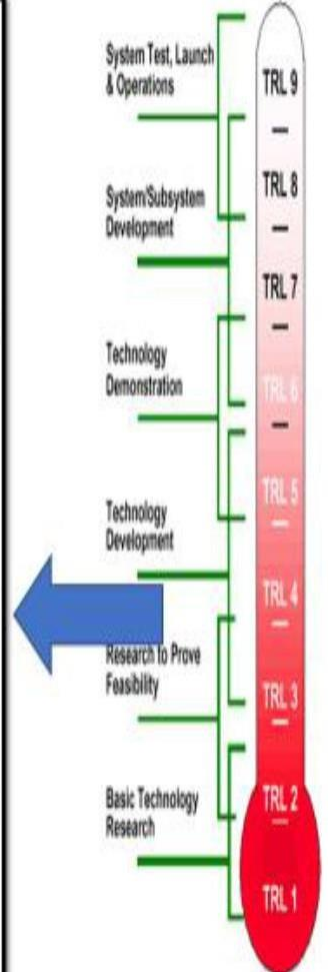
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DEPARTMENT OF ISE

Glimpses of Potential Scalable Innovations

<p>3D OPS Map Camera Bengaluru, Karnataka, India The Oxford College Engineering, Bommanahalli, Hosur Road, Bengaluru, Karnataka 560068, India Lat 13 32'50.00"N Long 77 37' 38.00"E Altitude 55.461 Meters AMSL</p> <p>Design and development of 3d printed bite force monitoring device for dental applications</p>	<p>Real Time assistive shoe for visually impaired people</p>	<p>Bengaluru, Karnataka, India</p> <p>Design and fabrication of voice-controlled chair using Theo Jansen mechanism</p>
<p>Bengaluru, Karnataka, India 95, Sarada Hill, Madhav Colony, Mangammanahally, Bengaluru, Karnataka, India Lat 13 12' 14.1188"N Long 77 37' 38.8384"E Altitude 55.461 Meters AMSL</p> <p>A Gesture Based Model To Assist Handicap In Search of Jobs</p>	<p>Bengaluru, Karnataka, India</p> <p>A Novel Traffic Management System Using Canny Edge Detection Algorithm</p>	<p>Bengaluru, Karnataka, India 95, Sarada Hill, Madhav Colony, Mangammanahally, Bengaluru, Karnataka, India Lat 13 12' 14.1188"N Long 77 37' 38.8384"E Altitude 55.461 Meters AMSL</p> <p>Intelligent Robot for College and Department to assist Guest</p>
<p>Bengaluru, Karnataka, India 95, Sarada Hill, Madhav Colony, Mangammanahally, Bengaluru, Karnataka, India Lat 13 12' 14.1188"N Long 77 37' 38.8384"E Altitude 55.461 Meters AMSL</p> <p>An Automated Foodways Track Restaurant</p>	<p>Intelligence Surveillance Patrolling DRONE</p>	



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Department of Mechanical Engineering



Regenerative braking using dynamo

Regenerative braking using a dynamo captures kinetic energy and converts it into electrical energy. This energy is stored in a battery or supercapacitor for later use. The dynamo is connected to the vehicle's wheels or drivetrain. During braking, the dynamo converts mechanical energy into electrical energy. This technology improves fuel efficiency, increases energy efficiency, and reduces wear on brakes. It is commonly used in electric and hybrid vehicles