



**IIT Palakkad
Technology IHub Foundation**

® Driving automation for energy and safety

RENEWABLE

Compendium of IPTIF's Technology Innovations

2025-2026



Dear Readers,

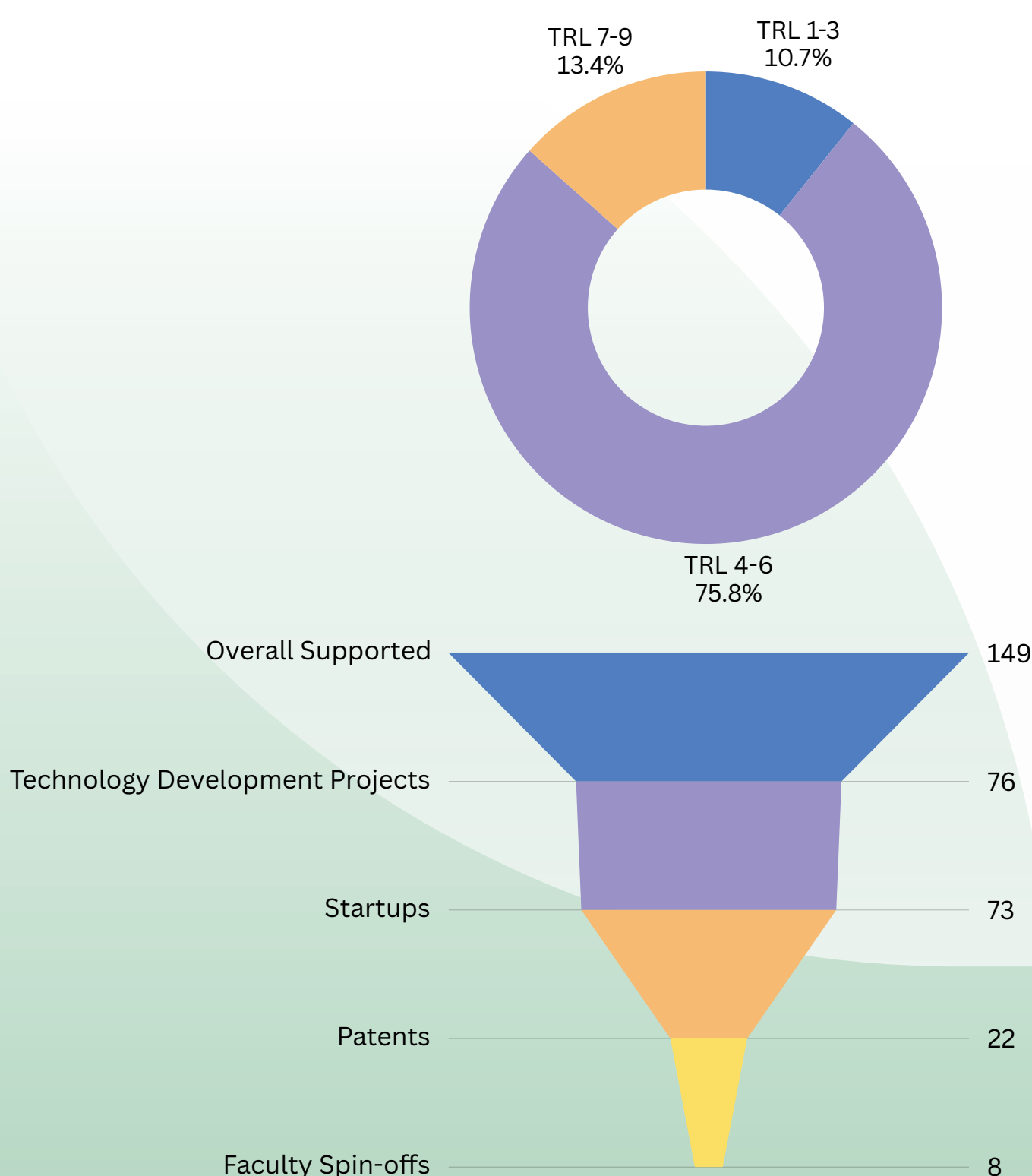
As we celebrate five successful years of IPTIF, we are delighted to present the 3rd edition of **RENEWABLE** – a compendium showcasing technologies and products for the fiscal year 2025–26.

Over the past five years, IPTIF has continued to strengthen its innovation ecosystem by supporting cutting-edge technologies across the domains of Intelligent Collaborative Systems (ICS), Energy, Safety, Sustainability, and Emerging Technologies. Through focused support under the categories of Doctoral Projects (for new IP and knowledge creation), Translational R&D Projects and Entrepreneur-in-Residence (for development of minimum viable products & spinouts), Startups & MSMEs (for market-ready technology solutions), IPTIF has fostered impactful innovations addressing real-world challenges.

In the fiscal year 2025–26, IPTIF significantly expanded its technology portfolio, enabling researchers, innovators, and startups to accelerate the journey from ideas to market-deployable solutions. This edition of RENEWABLE showcases a curated collection of technologies and products that reflect IPTIF’s commitment to technological advancement, industry relevance, and societal impact.

We are proud to present **64 technologies and products** featured in this edition, highlighting innovations across diverse sectors and applications.

The infographics below provide an overview of IPTIF’s technology portfolio and key achievements during the year 2025–26.



Editorial Team

M Dhilipkumar

Senior Associate
Technology and Entrepreneurship, IPTIF

Abishai Premanandan

Junior Associate -Creatives, IPTIF

Nirmuktha Arun

Junior Associate
Governance & Statutory Compliance, IPTIF

Pavithra S

Senior Associate- Programs, IPTIF

Vishnu Narayanan

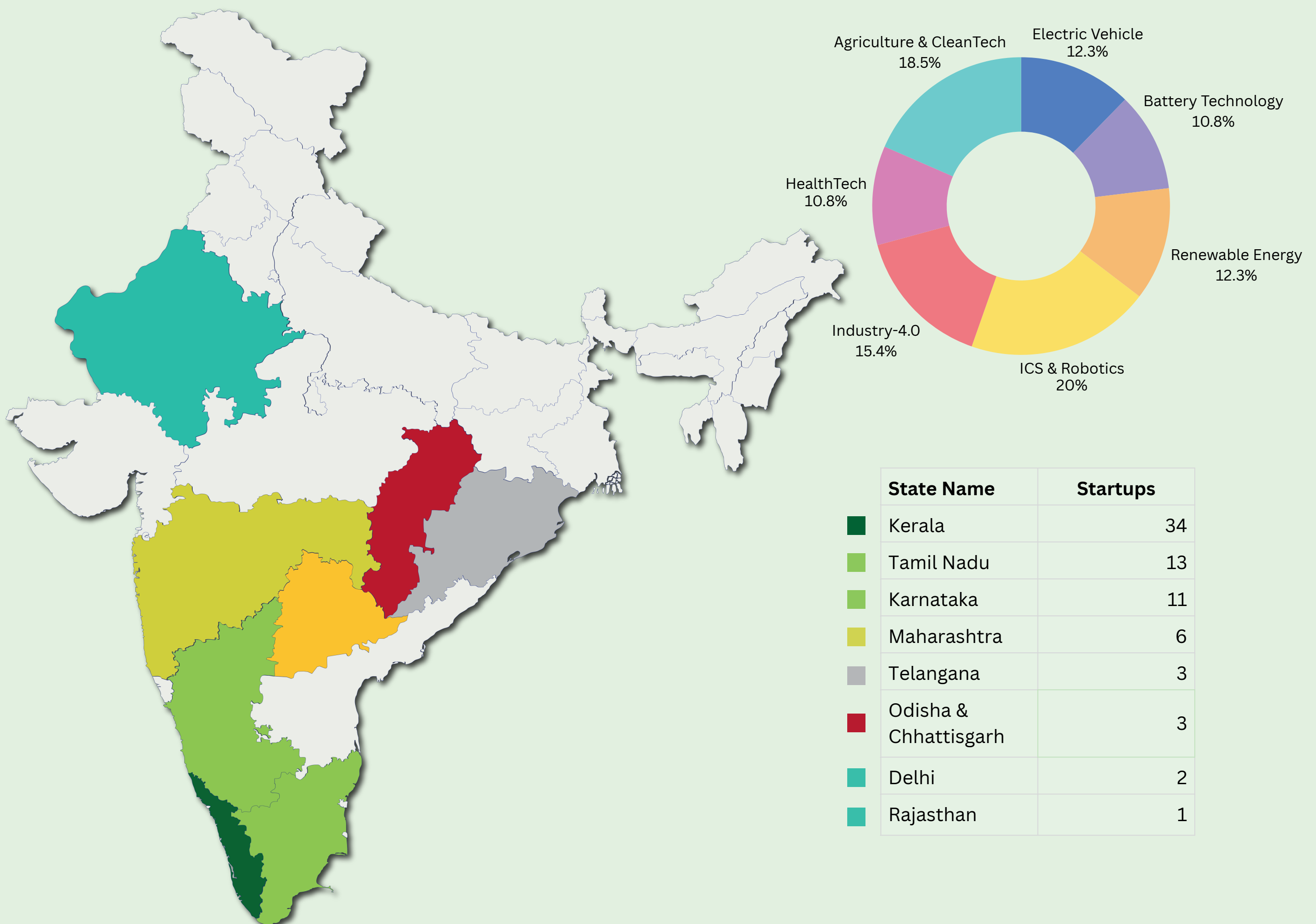
Manager Operations, IPTIF



IPTIF Startups

IPTIF has been playing a pivotal role in fostering technology-driven entrepreneurship by supporting innovative startups across diverse domains, including Intelligent Collaborative Systems (ICS), Energy, Safety, Sustainability, Electric Vehicles, Renewable Energy, and other emerging sectors. Through its flagship innovation support programs like IMPACT, UYARE, and EIR, IPTIF has enabled aspiring entrepreneurs, researchers, and technology innovators to transform promising ideas into scalable products and impactful business ventures. The growing portfolio of 73 startups directly supported by IPTIF reflects a strong commitment to strengthening the innovation ecosystem and promoting indigenous technology development aligned with national priorities.

To accelerate the journey from innovation to commercialization, IPTIF provides a comprehensive support system through its startup support programs and allied verticals. Startups are supported at various stages of product development through funding assistance, technical and business mentoring from seasoned experts, access to research and testing infrastructure, prototype development support, industry interactions, and business guidance.



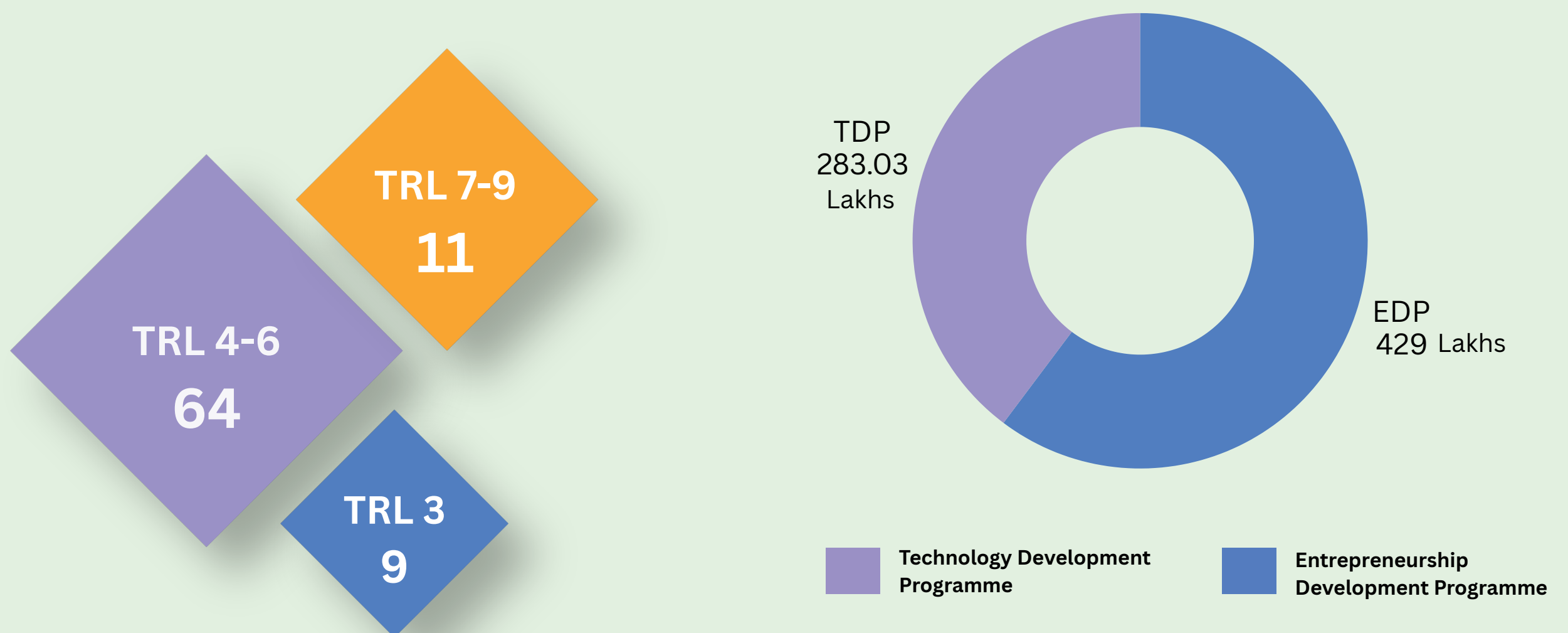


IMPACT

Innovation-to-Market Product Acceleration in Cyber Physical Technologies

IIT Palakkad Technology IHub Foundation's flagship product acceleration initiative, the **IMPACT** program, is a platform dedicated to transforming breakthrough research into commercially viable and deployable technologies. Focused on Cyber-Physical Systems (CPS) and Intelligent Collaborative Systems (ICS), the program empowers innovators to advance technologies from **TRL 3** to **TRL 8**, bridging the critical gap between laboratory innovation and real-world deployment.

IMPACT has already established itself as a catalyst for India's deep-tech ecosystem. Across **three successful cohorts: "IMPACT-1.0, IMPACT-2.0, and IMPACT-3.0"**, the program has enabled **48 startups** (*Entrepreneurship Development Programme*) and **36 technology development projects** (*Technology Development Programme*) from multiple states to develop indigenous, high-impact technologies. These innovations span Electric Mobility, Renewable Energy, Intelligent Systems, Agriculture & Cleantech, Healthtech, Defense, and others.





TRL-9

Agriculture Drone - Farming System

NIREEKSH AG—Multirotor Quadcopter farming system for field-level data collection, analysis, and action using advanced sensors (NIR, IR, RED, RED EDGE, RGB). Integrated with the FIA UAV drone for pesticide spraying. Integrated system commercialized

IPTIF supported the integration of sensors and the crop pest/disease detection feature into Nireeksh AG UAV with field validation.

Mr. Devan Chandrasekharan
Fuselage Innovations Pvt Ltd

www.fuselage.co.in

IoT-Enabled BMS & LFP for 2W/3W EVs

IoT-integrated 1.5 kWh swappable LFP packs with BMS architecture for 2-wheelers to enhance the second life of battery packs while maintaining backward compatibility. Also developed BESS and BMS integrated battery packs for mobility, marine, and defense applications.

IPTIF supported the development of electronic system architecture, lab validation, and early commercialization of the battery packs

Mr. Gaurang Bindal
Elexo Energy Pvt Ltd

www.elexo.energy



TRL-9

Smart Compact Biochar Machine

Indigenous pyrolysis unit, an efficient biochar machine with reduced carbon emissions and heat loss, optimal for small- and mid-scale users. Currently commercialized and sold in the market, around 100+ machines are sold.

IPTIF supported from early-stage product development to pilot market launch.

Mr. Govind Sonavane
Agri Waste Pvt Ltd

www.agriwast.com



TRL-9

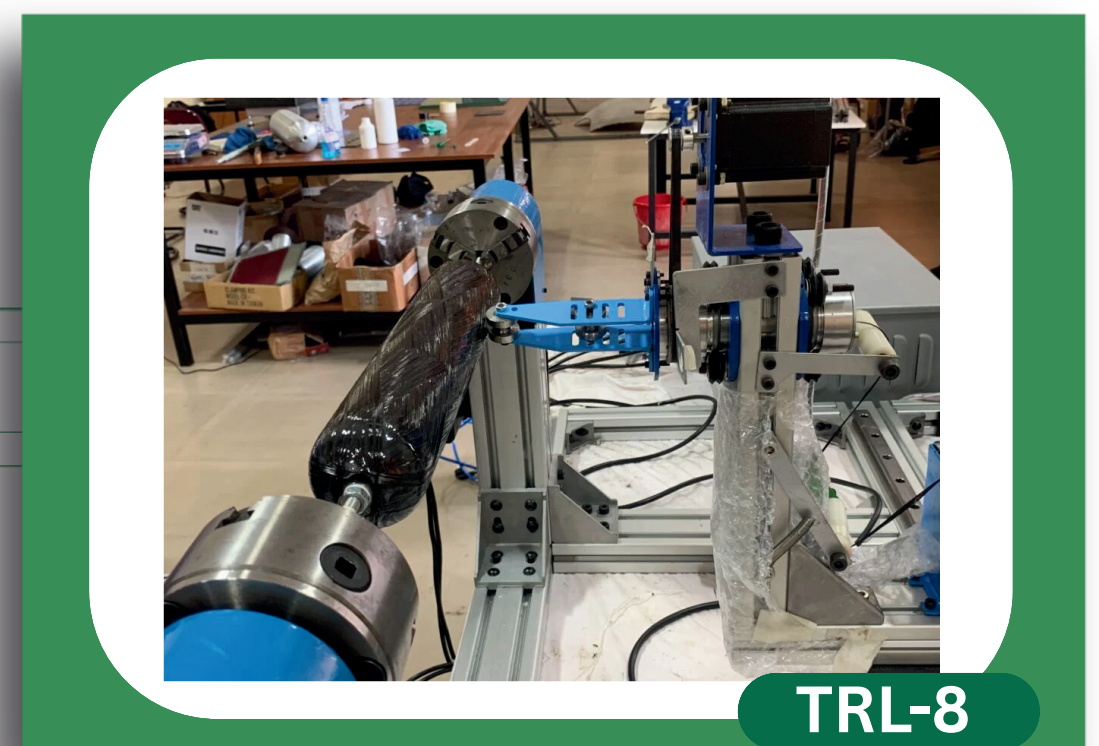
Tow-Preg Technology Filament Winding Machine

A patented multi-spindle, high-precision filament winding system combined with indigenously developed winding software for manufacturing composite structures such as high-pressure gas vessels for hydrogen cylinders and other applications.

Funded for developing an industrial scale filament winding machine and enter potential collaborations in manufacturing high-pressure gas vessels .

Mr. Vignesh K C
Vashishtha Research Pvt Ltd

www.vashishtha-research.com



TRL-8



TRL-8

IoT integrated Biogas Generating System

An IoT-integrated high-altitude biogas-generating CHUGG system for food waste management with, reliable operation in subzero temperatures. Installed a unit at Sikkim (13,000 ft).

Funded for the optimization of insulation technology, IoT integration and deployment of units in high-altitude regions.

Mr. Ravi Ayyangar

Avris Environment Technologies Pvt Ltd

www.avristech.com

Electric Propulsion Motor System

Radian Electric Outboard Motor - 15 HP electric propulsion unit with wired motor control for single propulsion unit and twin engine integrated with wireless communication system. Under the development and validation of a 25 Hp electric propulsion unit.

Funded for the validation of a 15 HP units and the development of 25 HP unit with control panel.

Mr. Sony Varghese

Seamoto Electric Engines Pvt Ltd

www.seamotoelectric.com



TRL-8



TRL-8

Wheelchair with self cleansing system

Patented wheelchair cleansing mechanism system with integrated mobility, toileting, and cleansing features for assistive care of disabled and elderly users, ensuring independence and dignity.

Funded for the optimization of the product, introducing autonomous version and market expansion

Ms. Sruthi Babu

Dhanvantri Biomedical Pvt Ltd

www.sahayathahealthcare.com

Micro Wind Turbines for lower wind zones

Grid-connected micro-wind turbines (1-5 kW) are suitable for low- and medium-wind areas, especially along with solar panels. Indigenous modular small wind turbines enhance energy generation even at both peak and night hours.

Funded for the development, enhancement and deployment of the micro wind turbine systems in the field and market.

Mr. Akhil Chandran

Aigon Mechatronics Pvt Ltd

www.aigon.in



TRL-7



TRL-6

Battery Cell Swapping System for EVs

Novel ~30 sec battery "cell swapping system" with integrated BMS and cell-swappable battery packs for EVs. Currently running paid pilots for fleet operations. Achieved 20% higher energy density and 24% lower production costs.

IPTIF supported from the ideation stage to Pilot implementation stage, for the product development & certification process.

Mr. Satyam Raj

InfinityX Innovations Pvt Ltd

www.magiiic.in

Tinnitus Detection and Diagonysing Equipment

Precise tinnitus matching and an IoT-based personalized multimodal management system for treating tinnitus patients. Under the process of CDSCO license.

Supported for the clinical validations of the product and early market launch.

Mr. Neelesh Kumar Pandit

Technoceutics India Pvt Ltd

www.technoceutics.com



TRL-6



TRL-6

Smart Collar for Dairy Farms

An IoT and AI-enabled smart collar system that detects reliable estrus (heat) and early-health conditions of dairy animals. Under pilot testing with industries and the scale-up stage.

Funded for the development of the product and implementing it into 10+ dairy farms via potential collaborations

Mr. Sanket Kedar

DruFarm Technology Pvt Ltd

www.drufarm.in

Solar Cell I-V Characterizer & Tester chunck

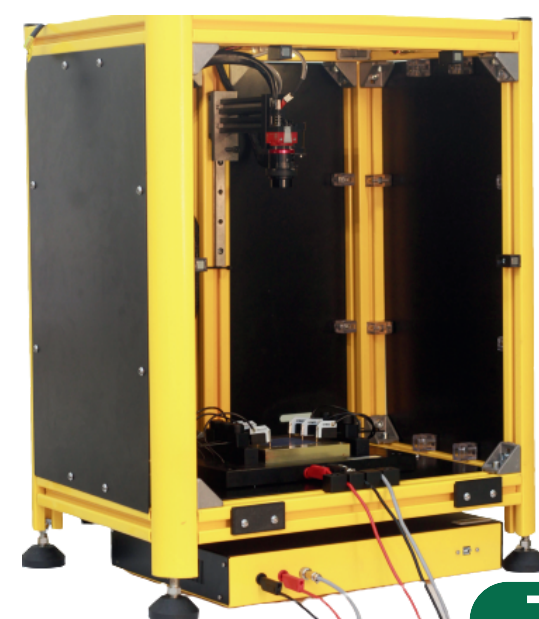
An indigenous LED analyzer operated with a 25-channel capability of illuminating up to a 25 cm x 25 cm area and a probing unit for determining the electrical characteristics of solar cells under simulated sunlight with monofacial and bifacial solar-simulating operation.

Funded for the development of a four-quadrant IV tester with field validation. Also funded for a hand-held version of the IV tester.

Dr. Arvind Ajoy

Bumblebee Instruments Pvt Ltd

www.bumblebeinstruments.in



TRL-6



Autonomous Navigation Bots

Edge-AI integrated architecture automated system for routing and fleet management for ports and logistic units.

Supported product optimization and development of 5-10 ton payload autonomous bots.

Mr. Ravindra Joshi
Nettoyer Automotives Pvt Ltd

www.nettoyerautomotives.wordpress.com

AI Integrated Drone Swarm System

Automated GNSS-denied AI Swarm Precision Strike Loitering Munition drone system. Fully functional swarm system for the aerial monitoring version with perception through imaging and thermal sensor fusion.

Supported the product optimization and deployment in the defence sector through stakeholder collaboration.

Mr. Animi Gourav
AccelUAV Pvt Ltd

www.acceluav.com



AI Powered Motion Tracking Suite

A 3D motion tracking suite integrated with Edge-AI for a proprietary enhancement console equipped with an SoC NPU for high-fidelity, private processing and data collection at the implementation facility.

Funded for the development of motion tracking framework and its validation for sports and rehabilitation.

Mr. Vishnu TU
Touch Motion Robotics Pvt Ltd

www.machenn.com

Long-duration Energy Storage System

Long-duration energy storage (LDES) systems through modular redox flow battery (RFB) solutions (vanadium-based) designed for commercial, industrial, and utility energy storage applications, including solar microgrids and distribution-level grid services.

Funded the development of 1-5 kW flow battery stack system with a validated BMS. Now moved to Pilot stage with 15 kW stack.

Mr. R Jeevith Reddy
ARKLE Energy Solutions Pvt Ltd

www.arkleenergy.com



Wireless control of Automobiles

IoT-integrated wireless control devices for automobiles (three- & four-wheelers), featuring a mobile app and integrated with an energy optimization system for the electric vehicles. Positioned as an aftermarket product for upgrading used cars with premium features and as an assistive technology for voice-controlled operations of non-critical features for upper-limb amputees.

IPTIF supported the technology from initial prototyping to pilot stage implementation.

Mr. Vimal Kumar CR
Vi Innovations Pvt Ltd

www.viinnovations.com



TRL-5

Smart Intra-campus patrolling Trike

A sustainable micro-mobility three-wheeler integrated with an efficient energy usage module and with a durable structural design. Currently implementing pilots with smart city police departments and the Railway Protection Force of Coimbatore and Chennai.

Supported product deployment and further PMF optimization.

Mr. Shakeel Akthar S
Elaicle Innovations Pvt Ltd

www.elaicle.com



TRL-5

Integrated VCUs and Autonomous Trike

Indigenous IOT (MZ-01), Molecule (Integrated motor controller)- controller and monitoring kit for Electric Vehicles and robotic applications. Under development of Zooty (electric vehicle)—an autonomous trike patrolling and surveillance assistant vehicle.

IPTIF supported from the ideation stage to the development of Molecule - Integrated Motor Controller device.

Mr. Akhil Gupta
Mazout Electric Pvt Ltd

www.mazoutelectric.com



TRL-5

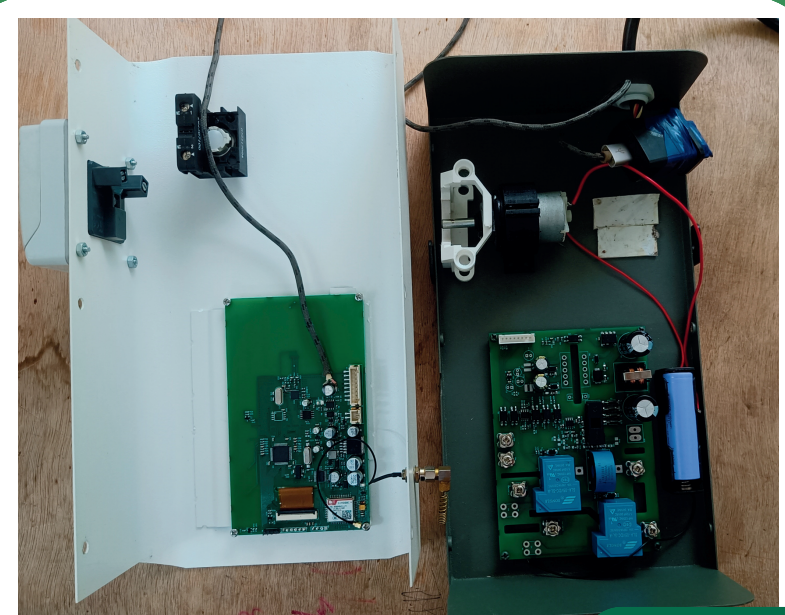
Smart plug with frequency-based grid detection for EV

Indigenous smart portable energy meter PCB system for grid sensing and a locking mechanism for the electric vehicles for efficient and safer charging access.

Funded for the product development and early piloting with the fleet operators and OEMs.

Mr. Nandu Kiran
Fourth Dynamics Pvt Ltd

www.fourthdynamics.in



TRL-5



Fast Charging Electric 3-wheeler

Indigenous Electric Vehicle with a modular chassis, fast-charging thermally stable battery system, and 72V high-performance powertrain. Integrated with the TecchVortex battery technology, the immersion fluid circulation system supports multi-use adaptability and durability of the product.

IPTIF support from the ideation stage to the homologation and ARAI certification stage.

Mr. Rahul A
Warbler PSM Pvt Ltd

www.warblerev.in

Breeze power Wind Mills

A vertical-axis wind turbine that works on a patented blade design that works between 3 km/hr and 11 km/hr wind speed for power generation. Developed 1.5 kW and 3.5 kW versions for field applications. Suited for proposing a 5 kW axial flux permanent magnet generator that operates in 3 km/hr to 11 km/hr wind speed.

Currently under field validation and in the early piloting stage of the product. Fund for the development of a 1.5 kW unit and finalization and certification of 3.5 KW.

Mr. Zareer Khushroo Aga
Breeze Power Solutions Pvt Ltd www.breezepowersolutions.com



Persistent USV Hydrography System

An autonomous AI-powered USV with hydrofoil and swarm capability that operates at 10 knots speed for surveillance, defense, silt measurement, and hydrography applications.

Supported product development and validation of an autonomous hydrographic survey system with swarm boats.

Mr. Barker Bhaskaran
Savtoa Software Solutions Pvt Ltd

www.savtova.com

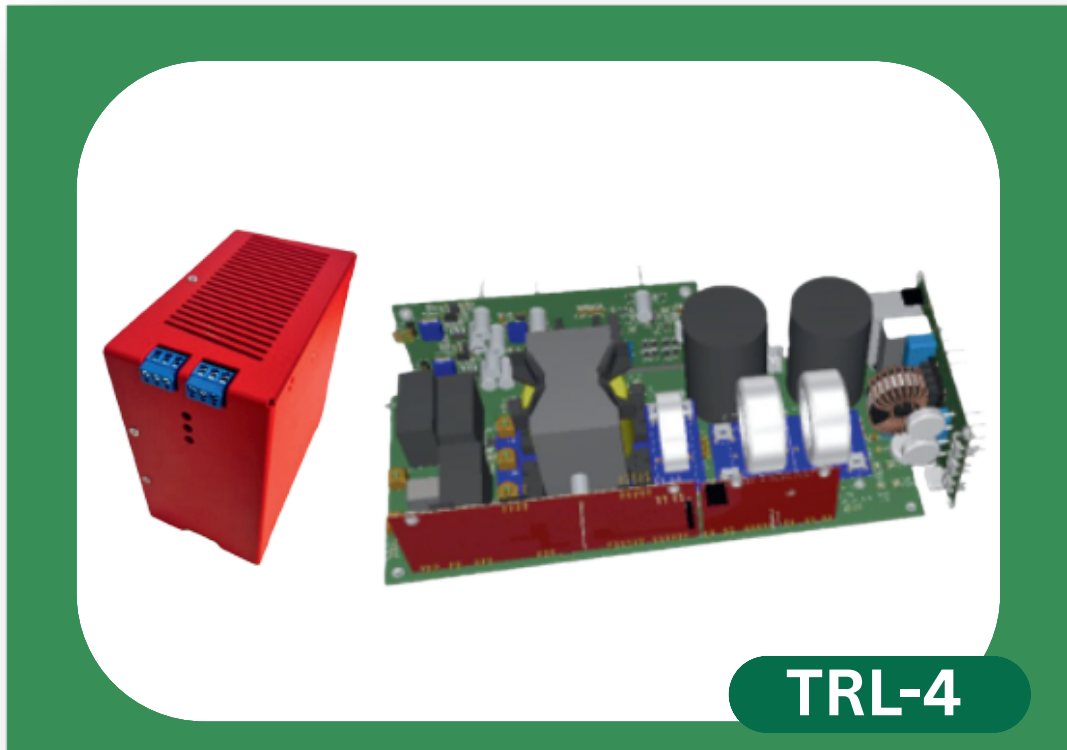
Coconut Harvester Robots

Novel robust robot integrated with mechanical actuators, motors, and features controlled via RF modules. Developing the computer vision module and integrating manipulators for harvesting.

Supported the project for product optimization and commercialization through collaborators.

Mr. Ashin P Krishna
Altersage Innovations Pvt Ltd www.altersageinnovations.com





TRL-4

Efficient Portable EV Charger

Smart portable 3.3kW portable EV charger and a Din Rail switched-mode power supply system for energy enhancement.

IPTIF supported it from the ideation to the product development stage.

Mr. Sankar S

eDrift Electric Pvt Ltd

www.edriftelectric.com

Active Thermal Management System for Battery packs

High-density battery packs with Active Thermal Management System (ATMS) to enable uniform cooling, improved safety, and consistent high-performance operation of electric vehicles. Currently in the process of validating the product in a relevant environment.

IPTIF supported the technology from the ideation to the product development and lab validation stages.

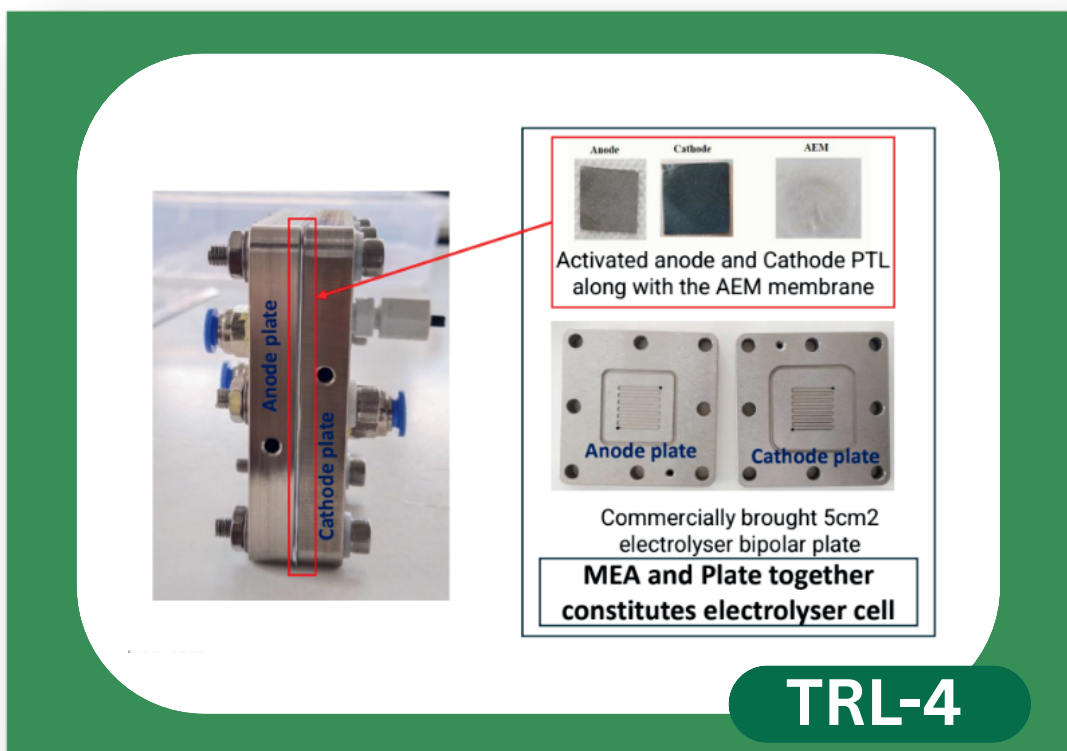
Mr. Rajasekhar

Zeromatter Tech Pvt Ltd

Linkedin - zeromatter-tech-pvt-ltd



TRL-4



TRL-4

AEM Water Electrolyser for Hydrogen

Highly efficient Anion Exchange Membrane (AEM) Water Electrolyzer for Green Hydrogen production with $>350\text{W}/\text{cell}$ ($\sim 2.5\text{W}/\text{cm}^2$) $>150\text{ cm}^2$.

Supported for developing a $100/150\text{ cm}^2$ cell with $1.7\text{ A}/\text{cm}^2$ and 1.09 V and develop a pilot electrolyzer system.

Mr. Anoop Selvaraj

Hyetron Energy Pvt Ltd

www.hyetron.com

Smart Type 2 EV Charger

ROAMBOX resilient, portable Type 2 EV charger and controller based on ESP-32-WROOM-32E for effective charging and monitoring purposes of the electric vehicles.

IPTIF supported the product development and enhancement of the product safety in relation to real-time operations.

Mr. Arun Vijayan

Deepfleet Energy Pvt Ltd

www.deepfleet.com



TRL-4



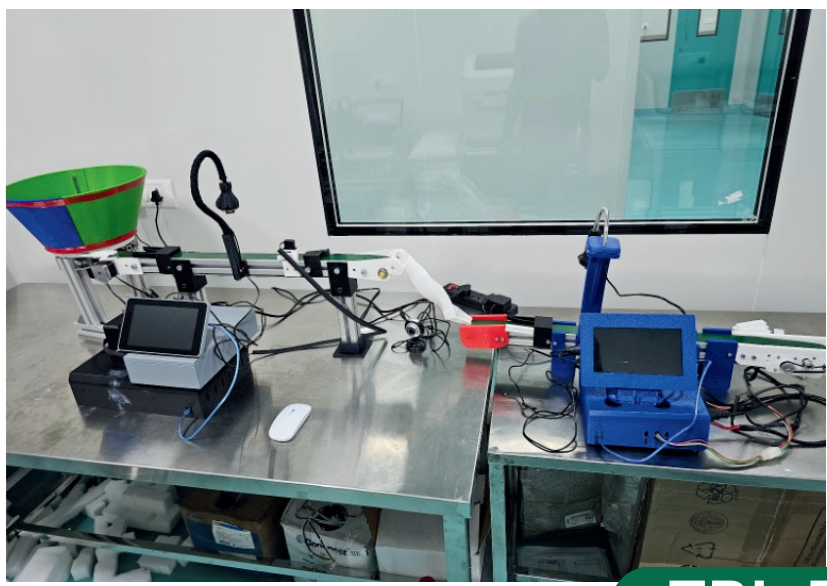
Faculty Spin-offs

IMPACT has empowered innovators to transform research outcomes into deployable products, intellectual property, and sustainable business models. The program has catalyzed the emergence of several spin-off ventures across sectors, including Electric Mobility, Renewable Energy, Smart Manufacturing, Intelligent Systems, Agriculture & Cleantech, and Healthtech.

Have supported 8 faculty spin-offs that exemplify the growing strength of India's indigenous deep-tech ecosystem, combining scientific excellence with entrepreneurial vision to create solutions that are scalable, impactful, and globally relevant. The technologies featured in this section represent not only successful commercialization journeys but also the spirit of innovation, resilience, and translational research nurtured under the IMPACT platform.



AI-powered Visual Inspection System



TRL-5

AI-powered real-time visual inspection system with a low-latency algorithm and optimized hardware for the industrial and educational sectors. Currently developing a fully functional visual programming IDE and custom PCB hardware kit integrated with the software features 16+ sensor/actuator blocks and a standalone edge-based AI sorting system for the SMEs and manufacturing industries.

Funded for the optimization of the core algorithm and development of the multi-node integration framework for field deployments.

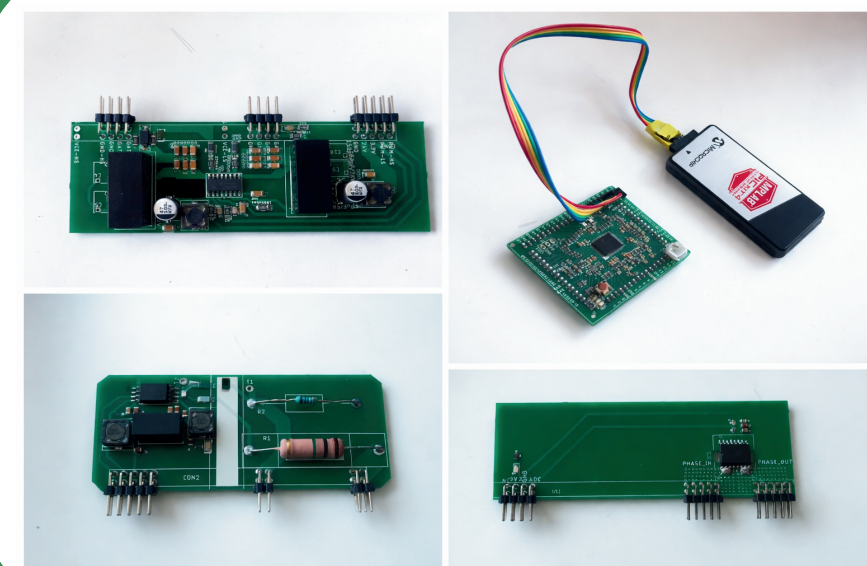
Dr. Vivek Chaturvedi, IIT Palakkad
SAEDGE AI Automations Pvt Ltd

Novel Motor Driver for BLDC/ PMSM/ Motors

An Indigenous motor driver board compatible with BLDC, PMSM, and analogous motors, enabling precise, efficient control across a broad spectrum of use cases. Currently, the board has been validated and tested in the lab and the relevant environment.

Funded and supported for the hardware drive development and startup formation for commercialization.

Dr. Vijay Muralidharan, IIT Palakkad
WAVELECT Technologies Pvt Ltd



TRL-4

Hydrogen AV Energy Management System

A 200W hydrogen-based hybrid system and adaptive control algorithms have been developed and tested at laboratory scale and in simulated operational scenarios. Currently, a scaled-down H₂ Autonomous vehicle (AV) model has demonstrated proof-of-concept.

Funded for the development of a 1 kWh H₂AV possessing a payload (> validated 2000g) and real-time validation.

Dr. Rajaa Vikhram, SRM Institute of Science and Technology
Cybershakthi Pvt Ltd



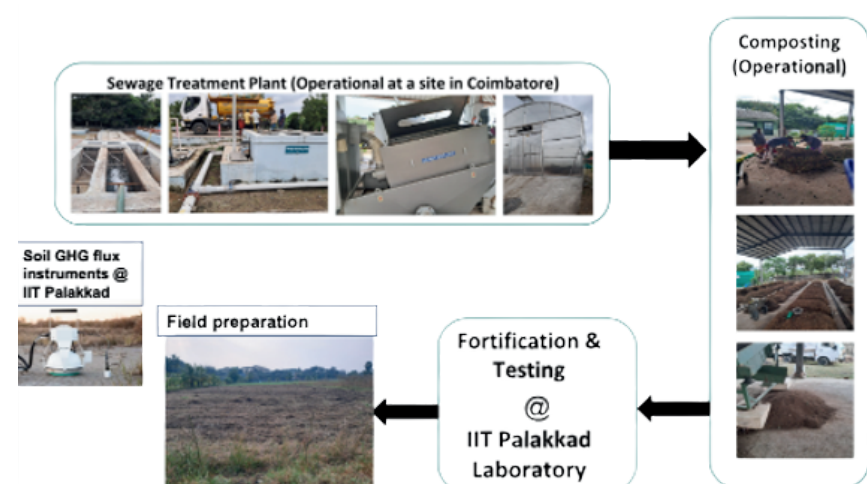
TRL-4

Smart Biosolid Management System

IoT integrated predictive model for optimized biosolid application in agriculture using field-generated data, Automatic Weather Station (AWS) with solar-powered system, and Smart Biosolids management and predictive tool.

Funded for the development of the system and startup formation.

Dr. Deepak Jaiswal, IIT Palakkad
Rehumus Technology Pvt Ltd



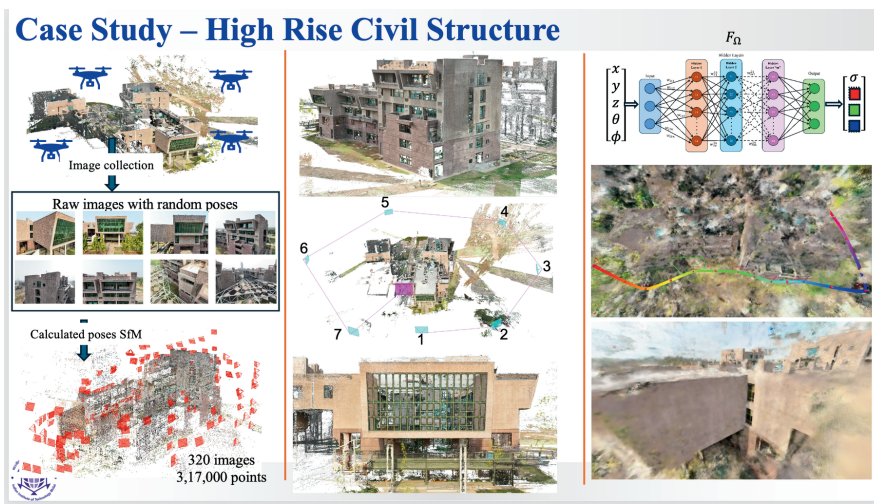
TRL-4

Structural Health Monitoring UAV System

Development of a synthetic digital twin/point cloud generation, reconstruction, and structural health monitoring UAV systems for forming a digital twin platform.

Funded for the development of an algorithm architecture for concrete surface crack classification and digital twin formation.

Dr. Ganesh Kolappan, IIT Bhilai
NDT Inspect Pvt Ltd



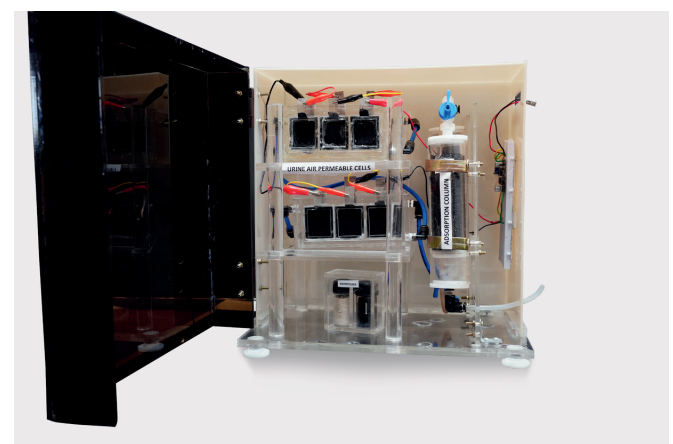
TRL-4

Smart Water Resource Recovery System

An Indigenous smart resource recovery system integrated with a novel architecture that simultaneously treats and recovers resources (water, energy, and nutrients) from urine. Currently, the developed and validated pilot scale testing is in the pipeline in the engineering field testing (EFT) platform to assess the system performance.

Funded for the product development, pilot testing of the system.

Dr. Praveena Gangadharan, IIT Palakkad
PritviChakr Innovations Pvt Ltd



TRL-4

Open Air Anode - Hydrogen Fuel Cell

Optimized porous transport electrodes for anode water vapor absorption, air diffusion, and oxygen evolution for the production of green hydrogen for an electrolyser of 1KW unit size.

IPTIF supported the design & development of an open anode electrolyser to the lab validation stage.

Dr. Ravi Kumar, Atria University
Hypower Green Energy Technologies Pvt Ltd



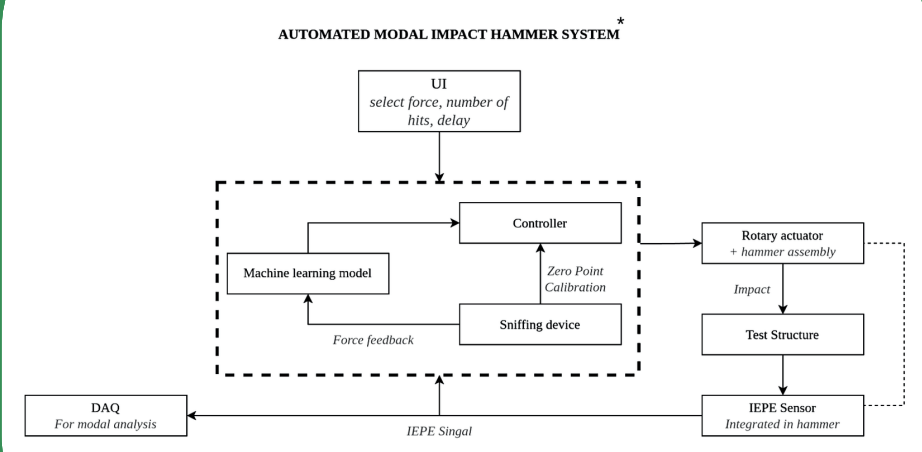
TRL-4

Automated Impact Testor and Analyser

Automated hammer excitation system using controlled actuation, sensing, and calibration architecture to improve repeatability and reduce operator dependency in modal testing and analysis. Interlinked with the software architecture to translate the data derived into a real-time report and validations.

Supported for development of programmable impact control and <5% force variation with lab validation.

Dr. Shaikshavali Chitraganti, IIT Palakkad
StateQ Dynamics Pvt Ltd



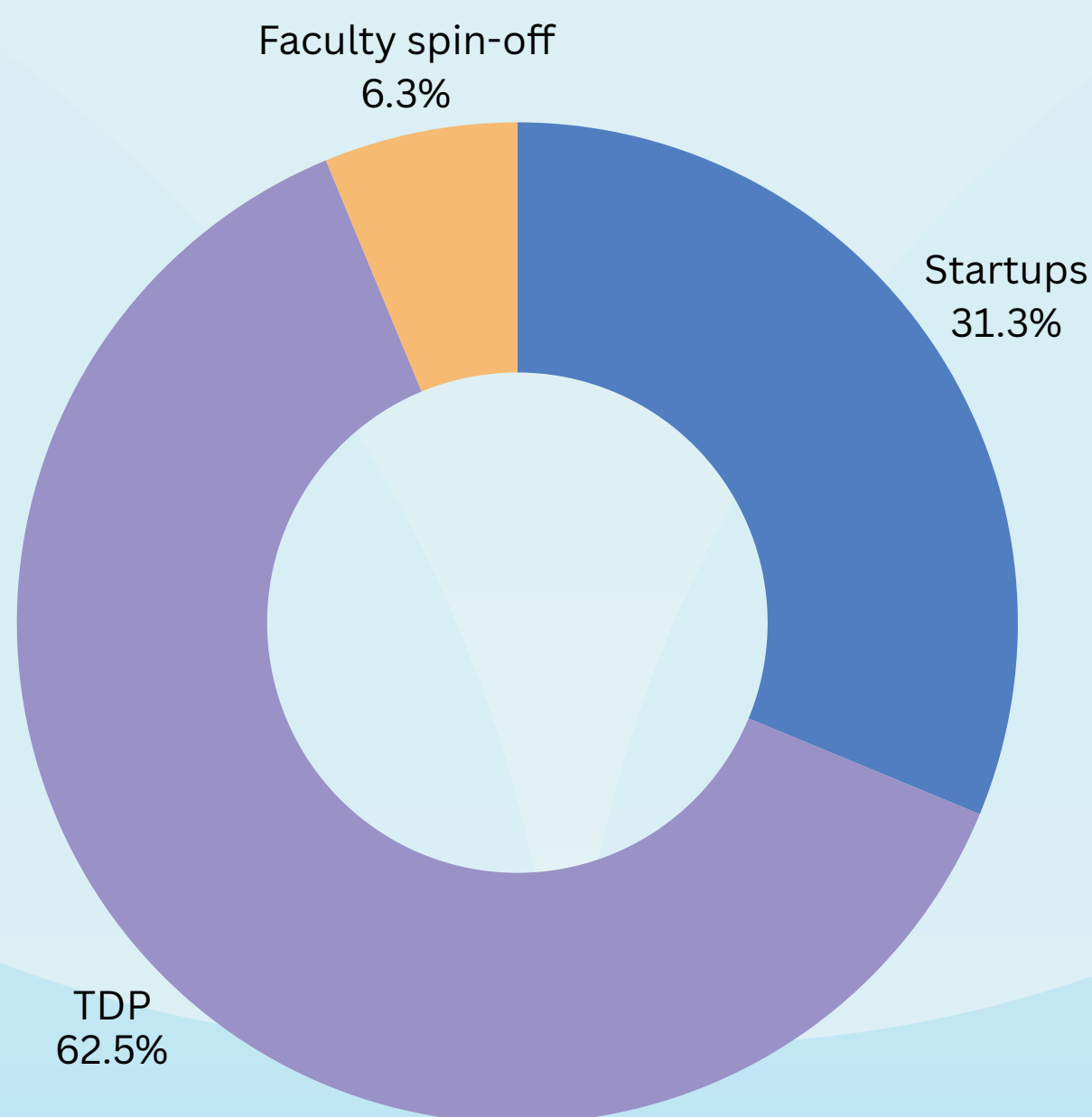
TRL-4



Unified Youth Advancement for Research and Entrepreneurship

UYARE, a special initiative by IPTIF is a transformative platform designed to nurture innovation, entrepreneurial thinking, and technology-driven problem-solving among aspiring innovators and early-stage entrepreneurs, including rural and tribal innovators. Conceived as a catalyst for grassroots innovation and emerging talent, the program seeks to inspire young minds to convert ideas into impactful solutions addressing real-world challenges.

Focused on fostering a culture of innovation and deep-tech exploration, the UYARE program has supported “**5 startups** and **10 technology development projects**” with product development funding, structured mentorship, technical guidance, exposure to emerging technologies, and access to a vibrant innovation ecosystem. The initiative encourages interdisciplinary collaboration and supports innovators in strengthening their concepts through design thinking, prototyping, validation, and market-oriented development.





TRL-5

Solar Electric Hybrid Tractor

A 35-40 HP Multipurpose Solar Electric Hybrid Tractor with a brushless permanent magnet electric motor and integrated IoT systems for smart monitoring.

Full prototype assembly until the certification stage was funded under the UYARE program. Currently under the field validation and certification process.

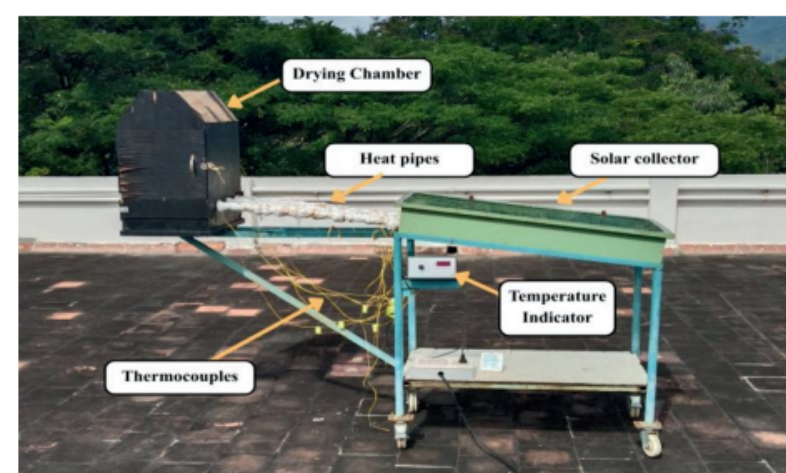
Mr. Ramu Banothu
Canorx Motors Pvt Ltd

Heat Pipe-Assisted Solar drying system

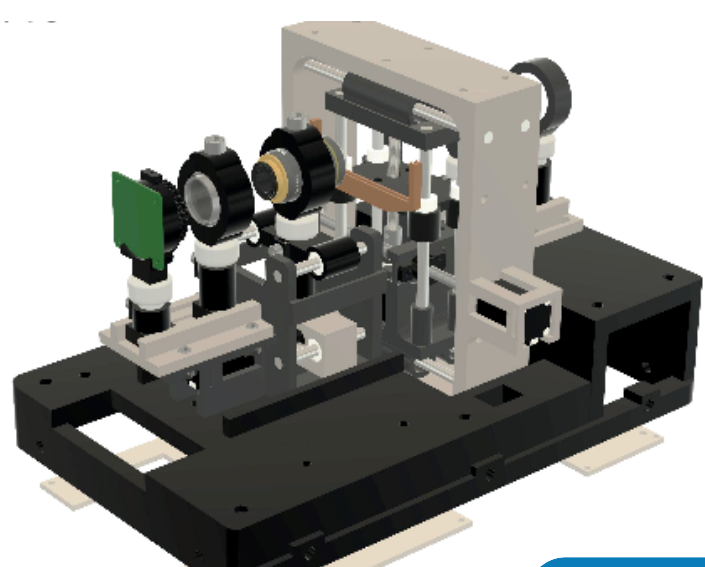
Novel indirect solar collector chamber with thermal storage material (aluminum plate) suitable for a 20 kg capacity dryer that is integrated with a heat pipe-assisted solar drying system for agricultural products in rural areas.

Supported for the product development and validation in the relevant environment.

Dr.A Asha Monicka
Karunya Institute of Science and Technology



TRL-5



TRL-4

AI-Enabled Autofocusing Digital Microscope

An Indigenous GRBL-based customized G-code interpreter algorithm to control motors in relation to the real-time sample visualization via manual jogging and auto-focusing/aligning via UI from the microscopic smears integrated with an anti-wobbling mechanism.

Funded for product development and optimization of autofocusing feature.

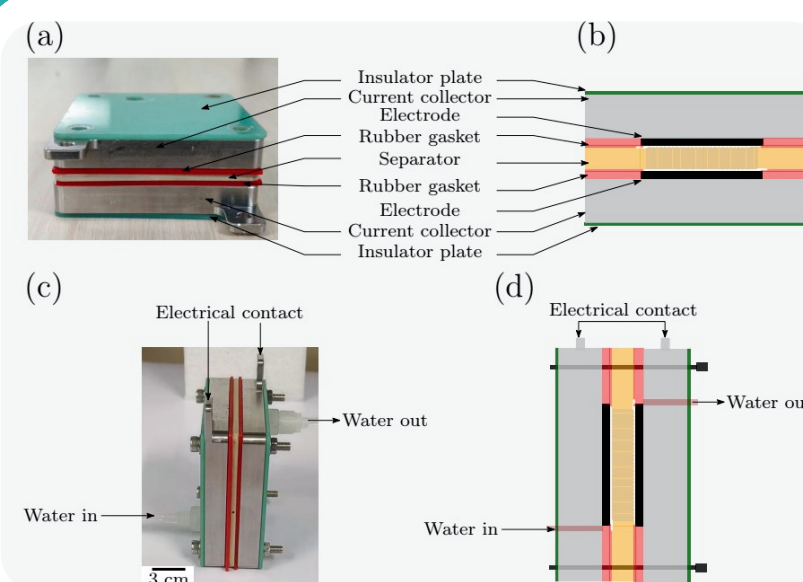
Dr. Earu Banoth, NIT Rourkela
Glowvista Instruments Pvt Ltd

Efficient Silicon Membrane filtration System

Novel porous silicon electrodes and a membrane that acts as the capacitive deionization (CDI) filter layers, along with the metal oxides, for an efficient water desalination process.

Funded for the development of passivated porous silicon electrodes and membranes, and their lab validation.

Dr. Revathy Padmanabhan
Indian Institute of Technology Palakkad



TRL-4

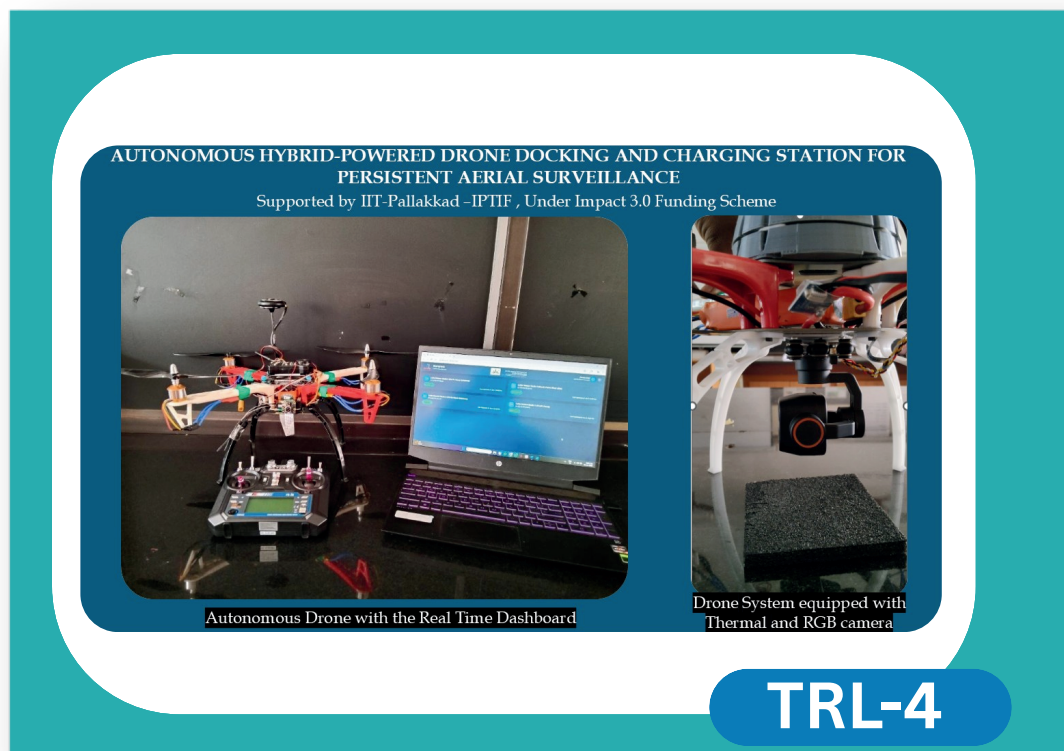
Drone-based Animal Detection and Surveillance

Animal Detection and Surveillance system for Man-Animal Conflict integrated with Drone and alarming units. Cloud computing algorithm to analyse the data from the sensor node (PIR, Acoustic, and Seismic Sensor) integrated with IoT components for drone triggering and alerting systems via LoRaWAN gateway. Currently operates at up to 25 meters.

Funded for the optimization of sensor fusion architecture and field validation of the system with real-time data.

Dr. Prawin Angel Michael

Karunya Institute of Science and Technology



Smart Greenhouse System for Cold climatic region

Edge-based IoT integrated AI-assisted decision-making system with LSTM for time-series prediction and a random forest model for operating actuator units to support cultivation in cold climatic regions.

Fund it for the development of the system and field validation with data collection.

Dr Mehbob Ali

University of Ladakh



Electrochemical Immunosensor for detecting biomarker

Optimisation of an electrochemical immunosensor device made of a porous silicon membrane for the detection of a biomarker for acute brain injury.

Funded for the development of an electrochemical evaluation of porous silicon integrated with sensors.

Dr Abdul Rasheed P

Indian Institute of Technology Palakkad



Wearable Fetal Monitoring Device

A wearable maternal & fetal monitoring device with integrated sensor-based data acquisition and intelligent signal processing units.

Funded for the initial prototype development integrating FHR, MRP, UC, and basic field testing.

Dr. Tamilselvi

Zensit Smart Products Pvt Ltd

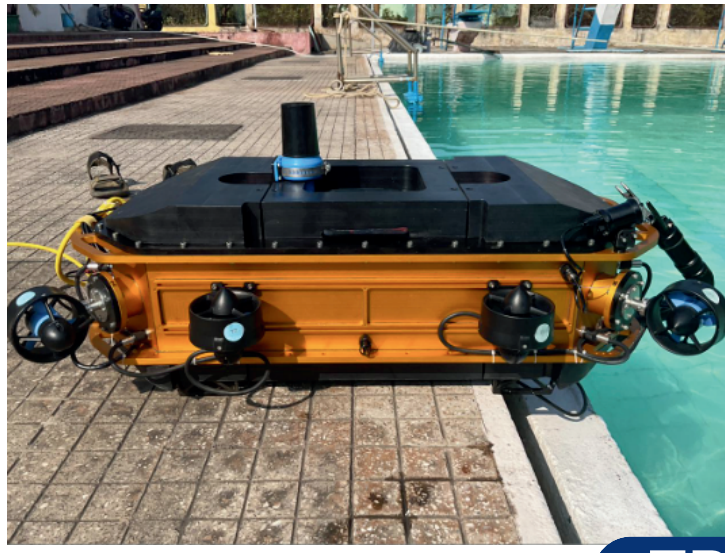






Translational Research and Development Projects





TRL-6

Autonomous Underwater 6DoF-UV

Novel six DOF multi-purpose vehicle integrated with motion control architecture to enhance the offshore energy sectors for tracking, positioning, and various deep-sea operations such as inspection and valve opening.

Supported the development of an intelligent motion control scheme for the autonomous underwater vehicle and system validation in relevant environment. Technology outlicensed to a marine startup for commercialization.

Prof. Santhakumar Mohan

Indian Institute of Technology Palakkad

Long-Endurance Glider Plane System

A 3.5-meter glider built with weights of 6.8 kg and 5 kg, integrated with an embedded software stack built (IMU, GPS, LiDAR, RF). 600 MHz NXP processor. Currently, working on further reducing the size, autonomous altitude control and solar cell integration into the product.

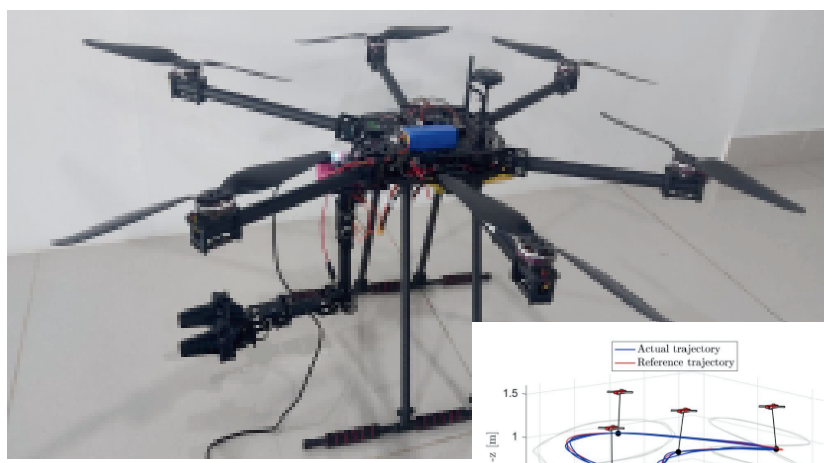
IPTIF supported the project from ideation to the field-level validation stage of the system.

Dr. Vijay Muralidharan

Indian Institute of Technology Palakkad



TRL-4



TRL-4

5 DoF -Aerial Dexterous Manipulator

Indigenous 5 DoF Hexacopter with a dexterous manipulator integrated with an algorithm for formation and stabilization control of two hexacopters carrying a payload. Currently, the system has been validated in the laboratory environment.

Supported the development of a manipulator assembly integrated with GPS and an autonomous operation system via estimation sensors.

Dr. Sneha Gajbhiye

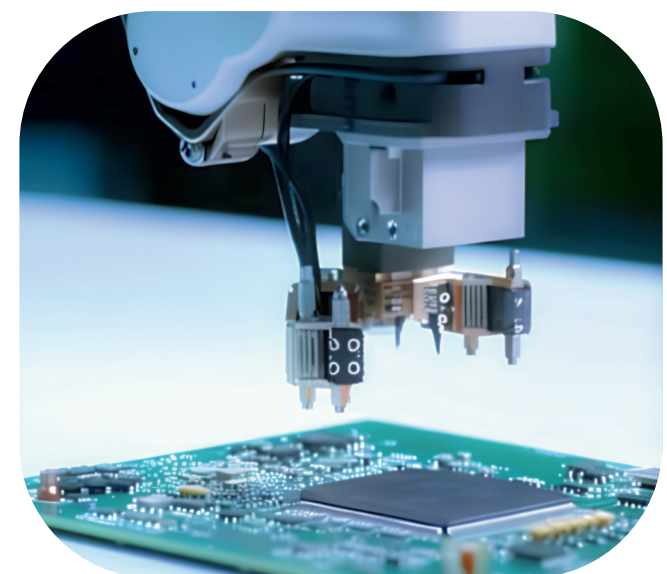
Indian Institute of Technology Palakkad

Algorithm for SMEs/OEM Production Enhancement

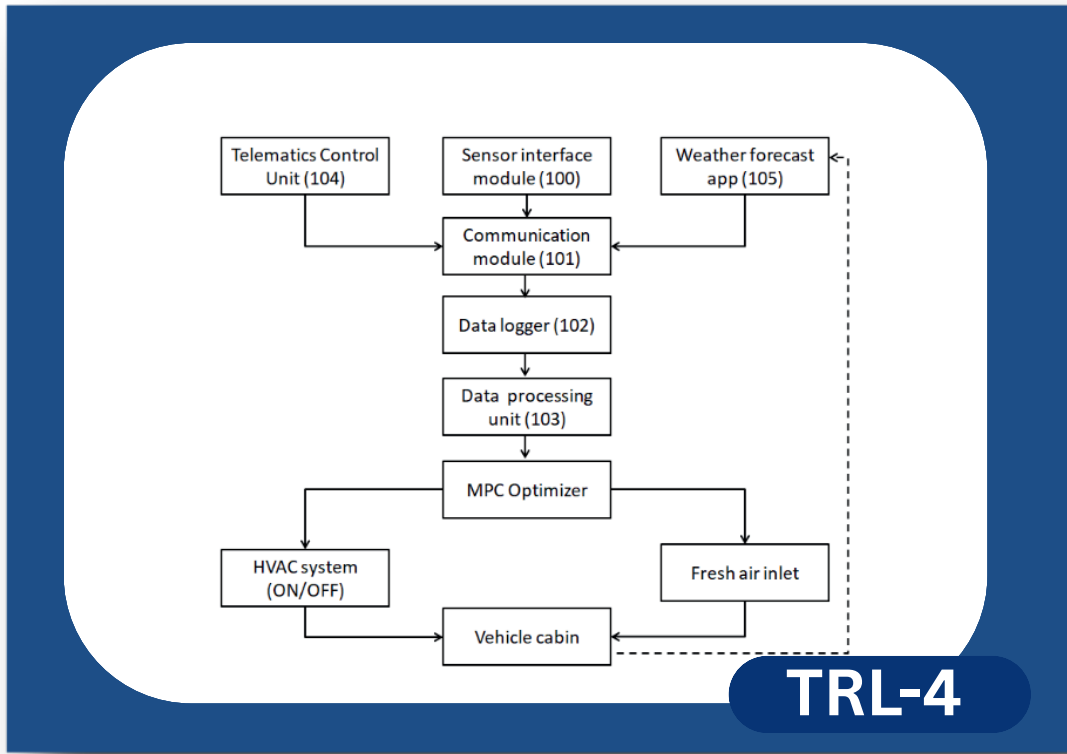
Systematic Architecture -a combination of Genetic Algorithm, Hierarchical Agglomerative Clustering, and Heuristics, MILP, and Greedy Assignment, Round-Robin Assignment, Matching Algorithms, and Mixed Integer Linear Programming for optimizing the components placement, selection, and hand movements in STM lines of SMEs and OEM industries.. Completed validation in an SME manufacturing line system and enhanced its efficiency.

Dr. Narayanan C Krishnan

Indian Institute of Technology Palakkad



TRL-4



TRL-4

Sensor Fused Domain ECU (DCU) for Automobiles

Novel systematic architecture on the integrational benefits of combining three Electronic Control Units (ECUs) into automobiles. Validating the Domain ECU (DCU) system through Hardware in the Loop (HIL) simulation for commercial vehicle applications.

Supported the project for the product development, patent filing and lab validation of the system.

Prof. Seshadhri Srinivasan

Kalasalingam Academy of Research and Education

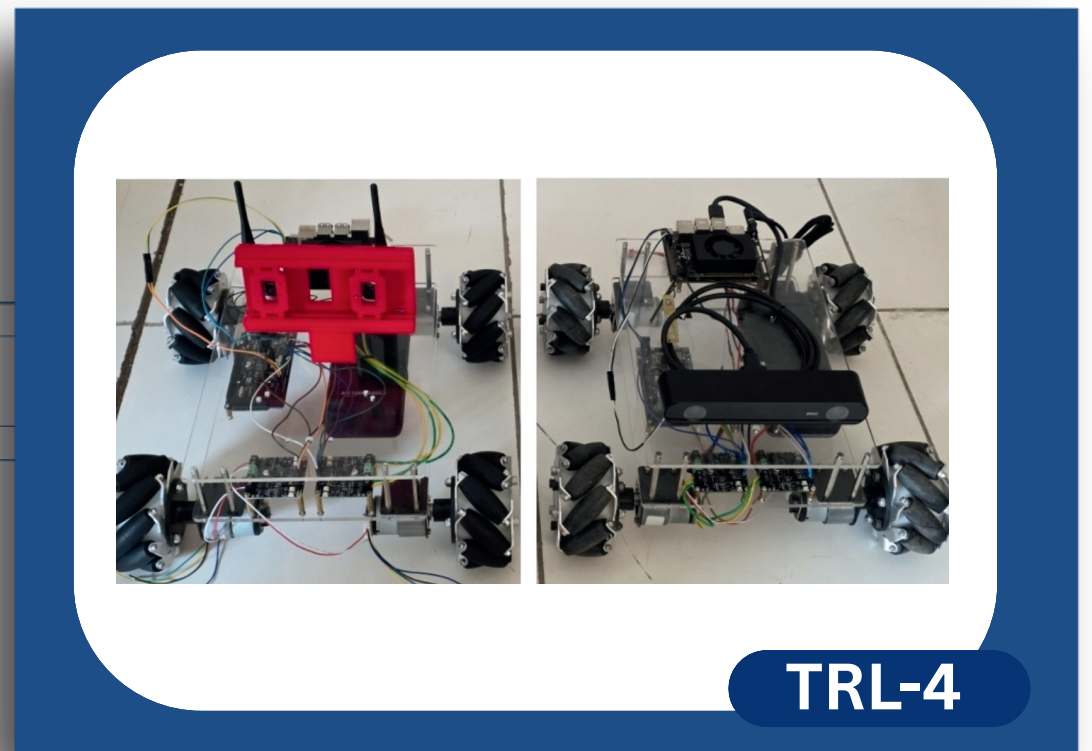
AI - based Advanced Driver Assistance System

Edge AI-based sensor data fusion system with low latency and decision making algorithm for Advanced Driver Assistance Systems (ADAS). Integrated with secure V2X (Vehicle-to-Everything) communication system to support smart, connected, and autonomous vehicle environments, while enhancing road safety, perception accuracy, and system reliability.

Funded for the algorithm architecture development and lab validation.

Dr. Archana.N

PSG College of Technology



TRL-4



TRL-4

BlockChain Integrated Smart Energy Meter

Real-time data sensor fused current and electrical parameters monitoring system integrated with IoT components for cloud computing with GSM module.

Funded for the development of sensor fused monitor and controller with lab validations.

Dr. J.Jayakumar

Karunya Institute of Science and Technology

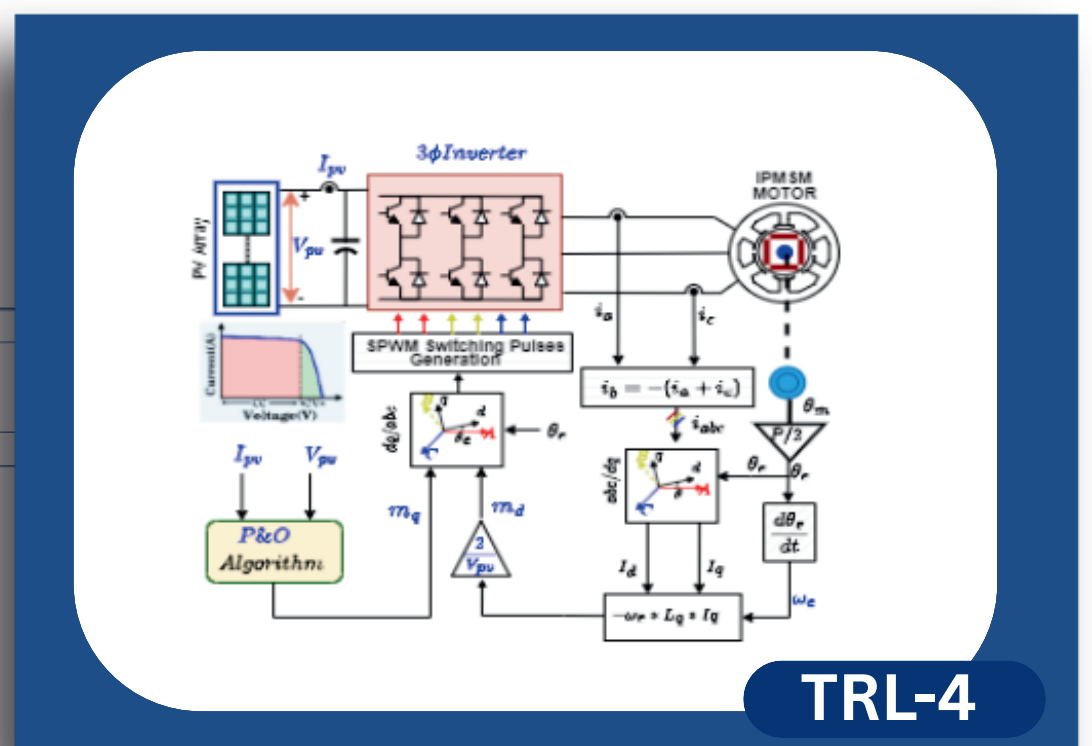
Sensorless PMSM/IMSM Controller Drive

Double Integral Sliding Mode Vector Control (DISMVC) strategy developed for sensorless operation of Interior Permanent Magnet Synchronous Motor (IPMSM) drive. Sensorless control eliminates the need for physical position sensors (encoders or Hall sensors).

Funded for the development of the IPMSM controller and lab validation of the technology.

Dr. K. Ramachandra Sekhar

Indian Institute of Technology - Ropar



TRL-4



TRL-4

Intelligent Wireless Charging Platform for Electric Vehicles

Indigenous 6.6 kW modular, plug-free wireless EV charging system with high efficiency and misalignment tolerance. Integrated with a real-time power control grid/PV-connected system and a cybersecurity layer for compliance.

Funded for the development of a 5 kW Tx and Rx intelligent wireless charging model.

Dr. Bharatiraja C

SRM Institute of Science and Technology

Efficient Swiss-Roll System for Hydrogen Production

Indigenous rolled inconel system operates at 13% hydrogen production in a direct core injection reforming strategy. Validated the combustor with initial tests using methane. Completed the lab validations and simulational studeis in OpenFOAM and ANSYS.

Currently under the development of unit validation with ethanol and bio gas.

Dr. Krishna Sesa Giri

Indian Institute of Technology -Palakkad



TRL-4



TRL-4

Exoskeleton System of Titanium alloy - Ti6Al4V

Wearable shoulder and passive ankle exoskeleton hardware mechanisms to reduce the interaction force between the shoulder/knee and exoskeleton joint axis for glenohumeral stability. Also, to measure the pressure/force created on the axis via the developed exoskeleton for monitoring.

Supported the development of the exoskeleton system from ideation to lab validation.

Prof. Asokan Thondiyath

Indian Institute of Technology Madras

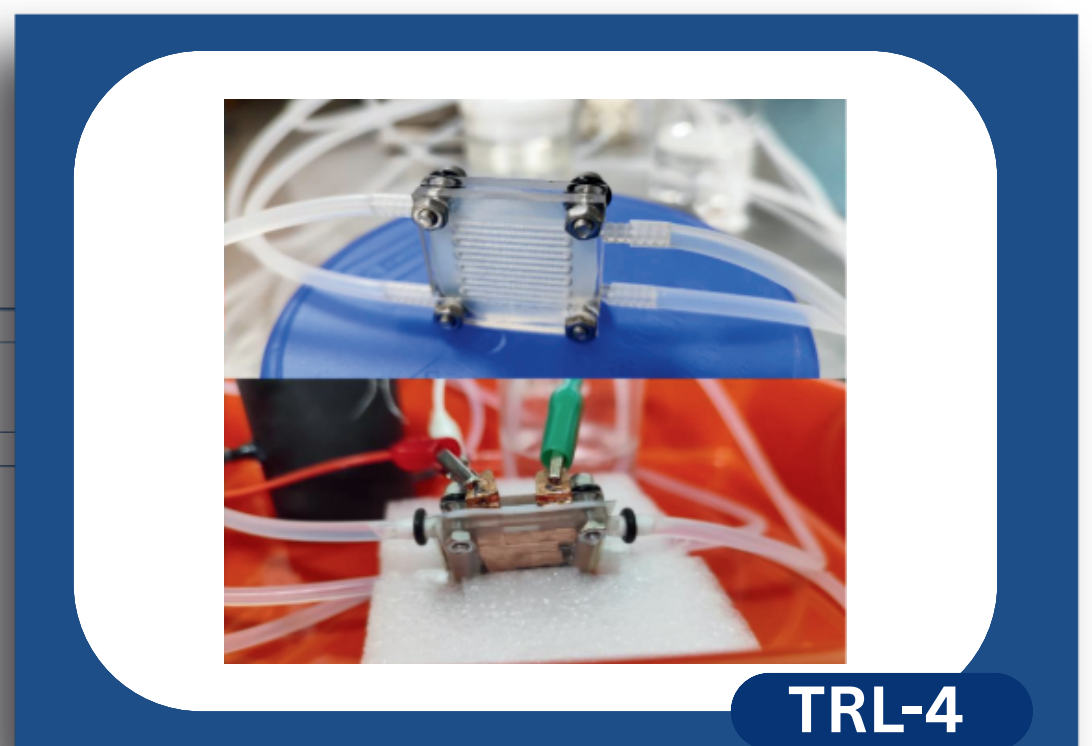
Electrochemical Platform for Green Fuel Production

Compact electrochemical platform to convert CO₂, N₂, and water into fuels like ethanol, ammonia, and hydrogen using high-selectivity catalysts and modular flow-cell systems, enabling decentralized green fuel production.

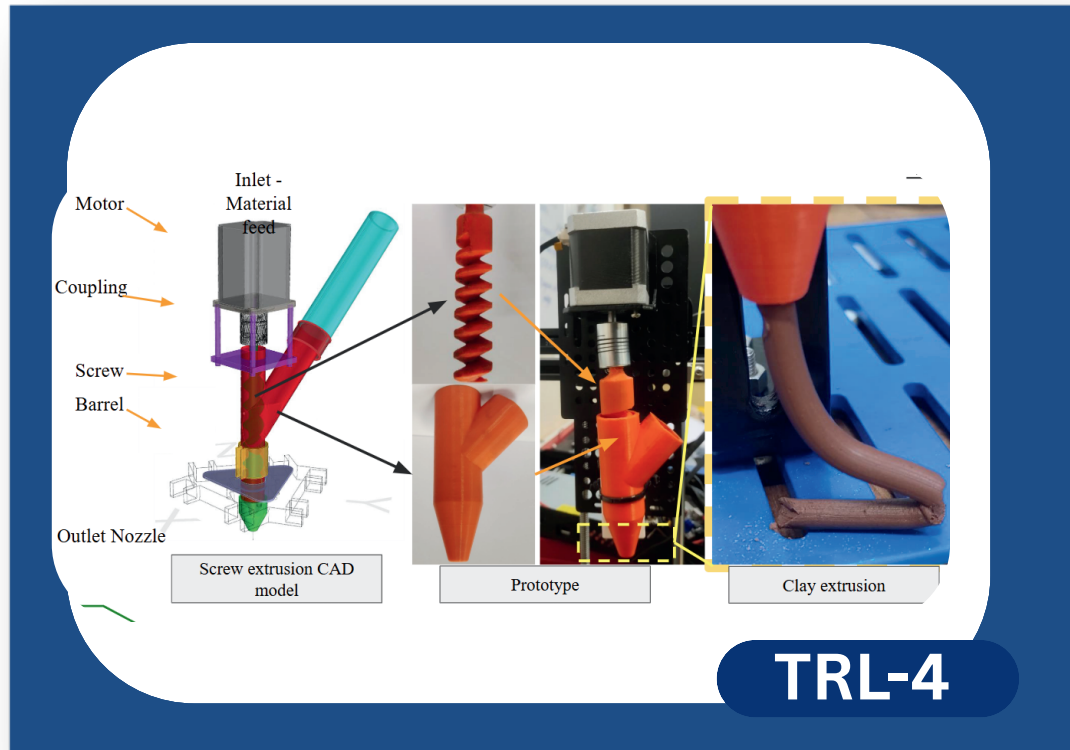
Funded the optimization of electrolyzers for SMEs and OEMs R&D centers' requirements and deployments.

Prof. G. Ranga Rao

Indian Institute of Technology Madras



TRL-4



Novel 3D printer nozzle with Sustainable Material

Novel Screw Extruder type nozzle for sustainable materials like clay and ash mixture. Integrated with an optimized algorithm for the specified 3D printing mixture material.

Funded for the development of the nozzle, associated software and lab validation of the 3D printing system.

Dr. Kanmani Subbu S.

Indian Institute of Technology Palakkad

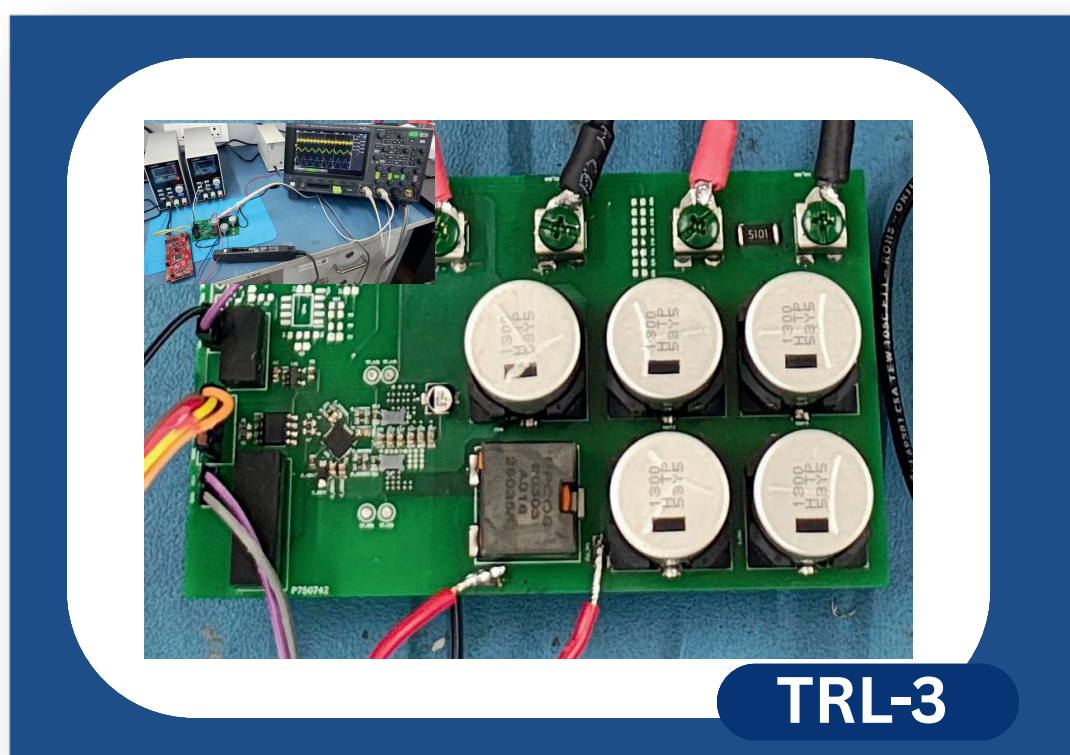
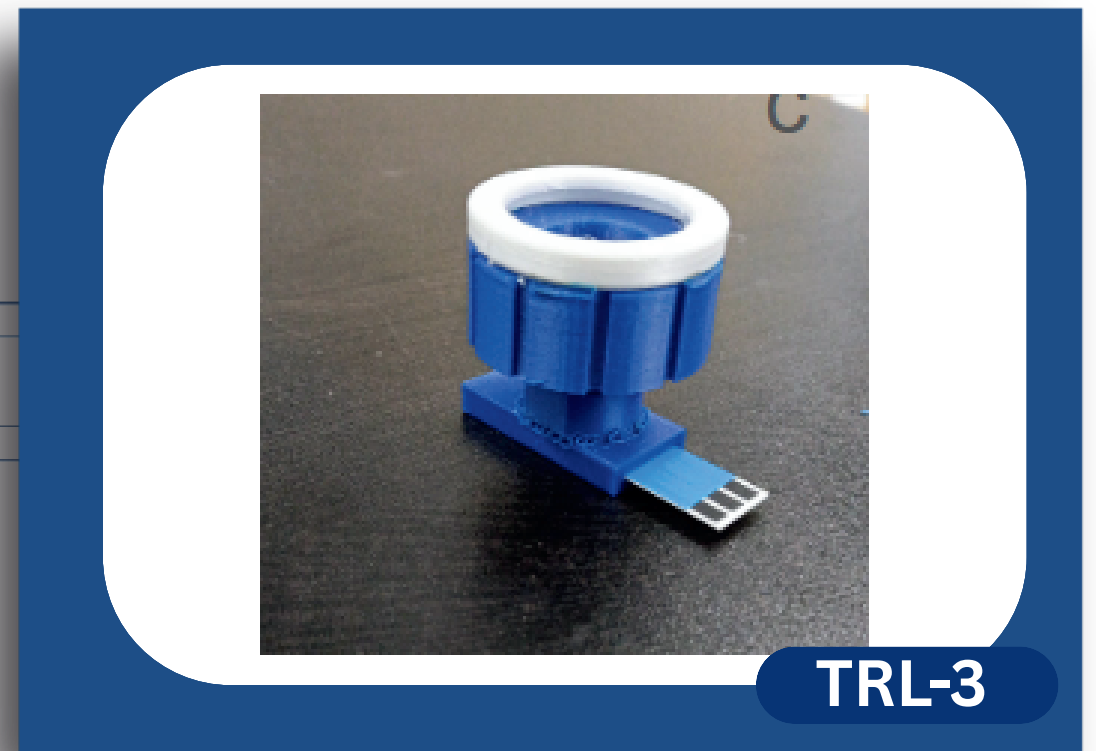
Early Battery Thermal Runaway Detectors

Novel catalytic overlayers sensors for early detection of battery thermal runaways in the battery packs of electric vehicles, integrated with an algorithm to analyze the combination of electrolytes and solvents consisting of organic carbonates (OC) to predict thermal runaways early.

IPTIF supported the development of the prototype, algorithm architecture and lab validation of the system.

Dr. Dinesh Jagadeesan

Indian Institute of Technology Palakkad



GaN-based battery Pre-heater for Cold Climatic regions

An optimized Gallium Nitride (GaN)-based system that circulates energy packets at the programmed magnitude and frequency between the battery cells and via the auxiliary energy storage for regulating and analyzing the battery temperature.

IPTIF supported the project from the ideation to the product development stage.

Dr. Naga Brahmendra Yadav Gorla

Indian Institute of Technology Palakkad

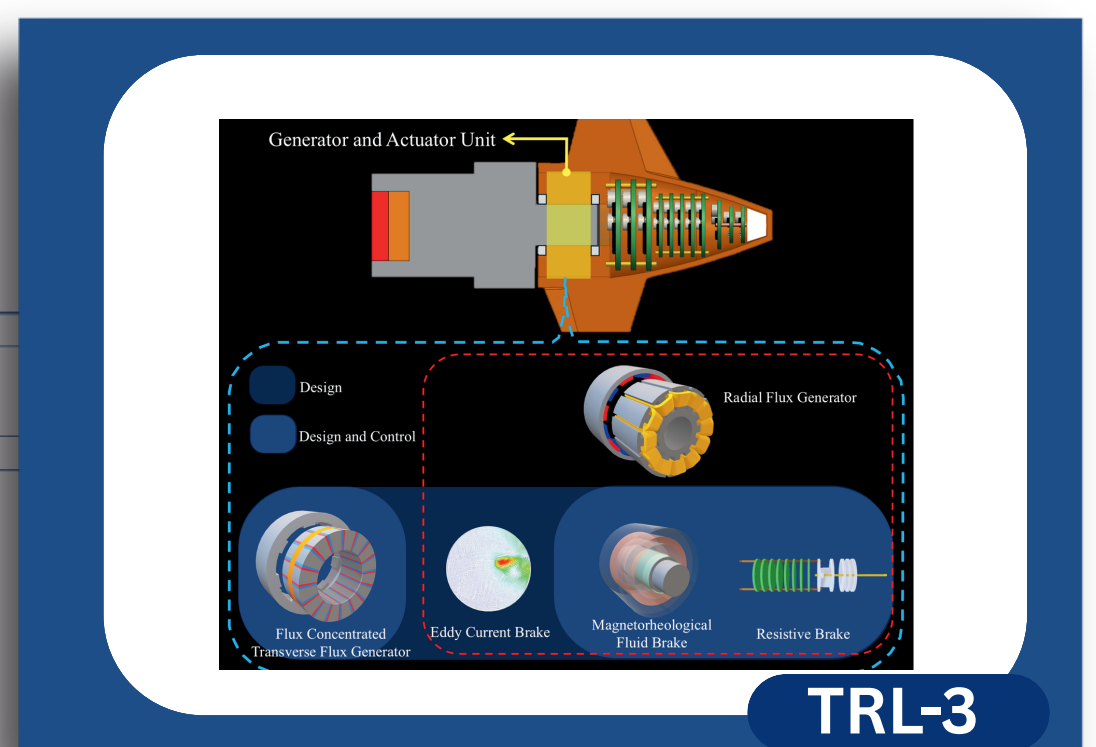
Dual-Spin Projectile Braking System

Fixed canard dual-spin projectile contactless braking systems integrated with robust controllers for disturbance mitigation that also act as generator suitable for application in dual-spin projectiles.

Funded for the development of robust controllers and super twisting algorithm for fixed canard dual-spin projectile.

Prof. Mangal Kothari

Indian Institute of Technology Kanpur



ENTREPRENEUR IN RESIDENCE (EIR)





TRL-6

Electric Outboard Motor System-Backwaters

An affordable, convenient, silent, and environmentally friendly electric outboard motor designed specifically for the serene and ecologically sensitive Indian backwaters.

Mr. Linshad

Allabout Innovation and Advanced Research Pvt Ltd

Crop-specific carbon-rich biopellet soil conditioners

Novel crop-specific biopellet technology integrated with biotechnology and soil ecology for regenerative and sustainable agriculture.

Supported for intelligent soil conditioning systems to improve crop productivity and reduce fertilizer dependency.

Dr. Chidambareswaren Mahadevan

Claybiome Innovations Pvt Ltd



TRL-5

Bio-based self healing concrete

Bio-based self-healing concrete additive integrated with microbial technology to enhance sustainable construction through crack repair, durability improvement, and carbon reduction.

Supported for the development of intelligent bio-concrete systems for autonomous crack healing and long-term structural performance validation.

Dr Megha P M

Shelt Innovation Pvt Ltd



TRL-4

Semi-Automated Pruning System - Horticulture

Battery powered cutting and disinfection mechanical system with 12V supply, enhance with 8W electric water pump for efficient pruning and chemical application in plants for better horticultural farming through safe, efficient, and uniform pruning operations.

Supported for product development and piloting of the system

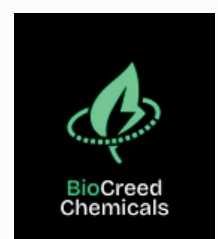
Mr. Abhishek M Kajagar

Neoklsan Innovations Pvt Ltd



TRL-4

Our Supported Startups



Ecosystem Partners



Stanford | Seed



KERALA
STARTUP MISSION®



Industrial Partners



अल्पसंख्यक कार्य मंत्रालय
MINISTRY OF
MINORITY AFFAIRS



BOSCH
Invented for life

MARUTI SUZUKI
INNOVATION



Terwilliger Center for
Innovation in Shelter



INFORMATION &
COMMUNICATION TECHNOLOGY
ACADEMY OF KERALA
ICTAK



Supported by



IIT PALAKKAD



IPTIF PROGRAMS



Supports Technology Product Development



Supports Tribal & Rural Innovation

Oorja Grand Challenge

Supports Innovation & Product Development



Supports Social Impact Startups



Management Entrepreneurship Program

Entrepreneur Development Program



Entrepreneurship In Residence

Pre-incubation program



Entrepreneurship Development Course

EiR Support

COMING SOON



IPTIF's Growth Engine for New-Age Venture Acceleration

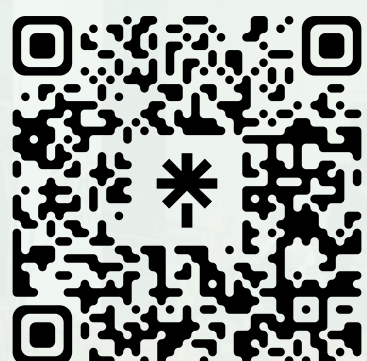
i - MEC

Driving Innovations in Clinically Driven Cyber-Physical Systems and Medical Electronics



Integrated Technologies for Next Generation Sustainable Sanitation

STAY IN TOUCH



Office:31, Kanjikode West, Nila Campus, IIT Palakkad- 678 623