VIT®
Vellore Institute of Technology
(Deemed to be University under section 3 of the UGC Act, 1956)

School of Electrical Engineering (SELECT)

Vision

To offer an education in electrical engineering that provides strong fundamental knowledge, skills for employability, cross-disciplinary research and creates leaders who provide technological solutions to societal and industry problems.

Mission

- Provide personalized experiential learning in industry sponsored labs to prepare students in electrical engineering with strong critical thinking and employability skills.
- Foster design thinking, creativity and cross-disciplinary research with highly qualified faculty to create innovators and entrepreneurs in the broad area of electrical engineering.
- Collaborate with national and international partners to provide innovative solutions to societal and industry challenges.

Dean's Message

Dr. Mathew M. Noel
Professor and Dean
School of Electrical Engineering
Vellore Institute of Technology, Vellore

'Develop skilled engineers to meet industry needs and thereby develop responsible citizens for our country and society'

The School of Electrical Engineering (SELECT) has over 93 faculty members who pursued their UG, PG and Doctoral degrees from top-notch universities. The faculty members are consistently performing well in teaching and research. Faculty members and students frequently receive awards, laurels and prizes for outstanding research contributions in their respective fields.

The school offers B.Tech. (Electrical and Electronics Engineering), B.Tech. (Electronics and Instrumentation Engineering), M.Tech. (Power Electronics and Drives), M. Tech. (Control and Automation), Ph.D and Integrated Ph.D in Engineering. Both B.Tech. and M.Tech. programmes attract the Intelligent students from the country and abroad. The B.Tech. Electrical and Electronics Engineering and B.Tech. Electronics and Instrumentation Engineering Programmes are accredited by the Engineering Accreditation Commission of ABET. All UG & PG programmes of the school are accredited by the Institution of Engineering and Technology (IET), U.K.

The placement record of the school has always been impressive. Almost 100% of the students secure job from the campus placement and many of them are recruited in core companies. We encourage our students to carry out industry based projects during their B.Tech and M.Tech degrees. The School has state-of-the art laboratories in almost all the areas of Electrical, Electronics and Instrumentation Engineering. The School has the latest simulation tools to cater various specializations and is equipped with facilities for measurement, characterization and synthesis of experimental as well as theoretical results. SELECT has industry sponsored advanced laboratories for performing world class research and consultancy. Danfoss Advance Drives Lab, Schneider Electric Smart Energy Monitoring Lab, Fluke Testing and Calibration Lab, Q-Max Automated Test Engineering Lab (Alumni Sponsored Lab) and NxP Semiconductors, India, have established Centre of Excellence for students R&D activities under the guidance of faculty members and industry experts.

Faculty – Student Collaboration

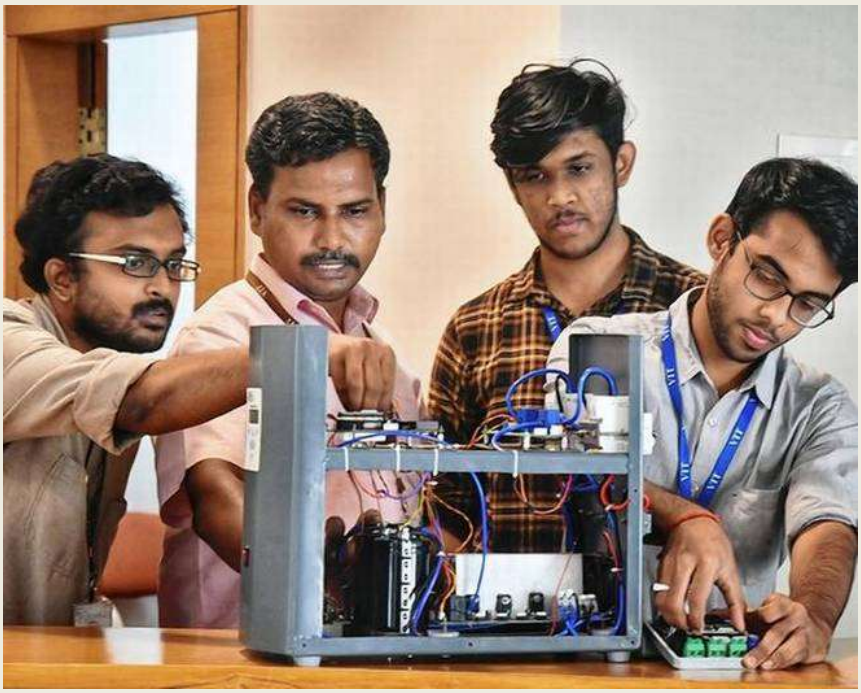
1. Rural Electrification

The School of Electrical Engineering at the Vellore Institute of Technology (VIT) has electrified 65 houses using solar energy in Alambadi village in rural Karnataka. The village did not have any power supply for the past 75 years.

Professors and students of the Solar Energy Research Cell (SERC), School of Electrical Engineering, did this under the project 'Intelligent Off-Grid System for Energy Sustainable Village', sanctioned by the Department of Science and Technology (DST), under the banner of the Mission Innovation Challenge — Off Grid Energy Access.

The team carried this out in association with its consortium partners — the University of Strathclyde, Glasgow, and the Roma Tre University, Italy — and Indian institutes like the Mahatma Gandhi Institute of Rural Energy and Development (MGIRED), Trust for Rejuvenation of Environment and Nature Development (TREND) and the Sri Venkateswara College of Engineering (SVCE), Karnataka.

"Under this project, Indian institutes collaborate with foreign universities and bring up innovation related to rural electrification so that it can be presented as a business model to African countries. The systems which we came up with will be tested in diverse locations across the country. Only nine institutes have been given this grant and ours is the only private one," said N. Rajasekar, professor, SERC.

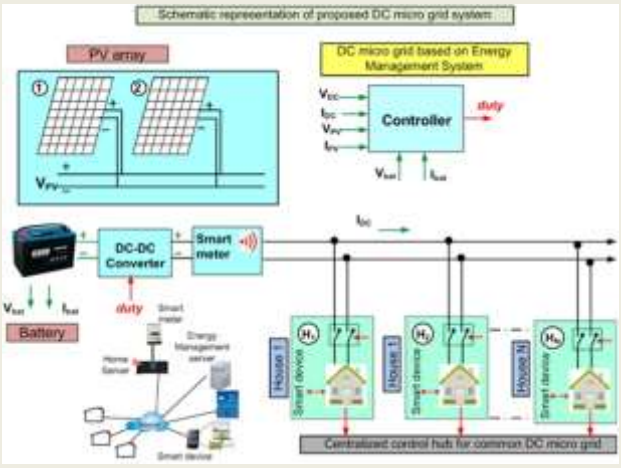


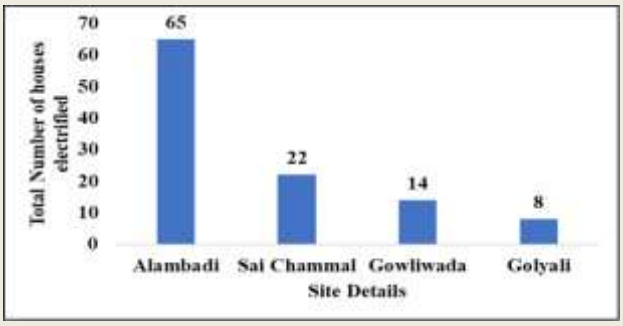
Key Outcomes

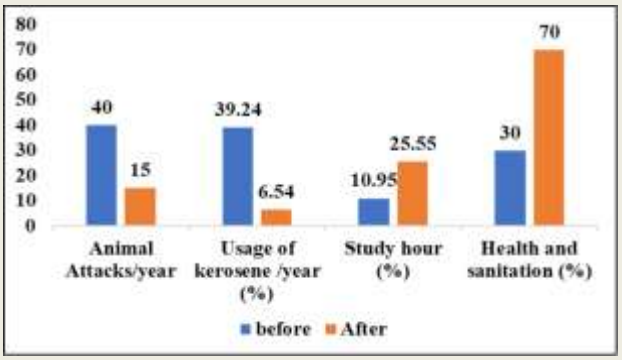
- An improved DC micro-grid architecture that delivers sustained power supply providing energy independency to rural villages
- Improves quality of life and wellbeing of the residents by providing energy access for Panchayath amenities.
- Generates employment opportunities for local youth in establishing entrepreneurial ventures using the uninterrupted power supply
- Enables productive uses of energy and sustainable livelihoods that can vastly improve the socio-economic development of local communities and employment rates for youths
- Development of smart devices to sense and supply the load demand via a cloud based architecture
- Reliable DC microgrid architecture with features of cloud based energy monitoring
- Smart metering and load demand control based on solid state circuit breaker arrangement
- Enhanced remote monitoring communication system using Long Range (LoRa) WAN wireless communication

Impact

- Installation of low voltage DC (LVDC) micro-grid improves living standards and enhances opportunity for entrepreneurship skill development
- This project has an impact on issues like health, education, income generation and standard of living.
- Supports the productive use of renewable energy resources and aids in sustainable livelihood activities that vastly improve the socio-economic status of local communities
- Impacts the microclimate by offsetting the carbon footprint of the area due to the usage of conventional methods of meeting energy requirements such as use of kerosene and firewood
- Promotes and facilitates the uptake of clean renewable energy technologies
- The project links modern-day technology to meet the energy demands of the deprived people through appropriate design and communication systems.
- Indigenous system design minimizes the overall project cost, complexity, and maintenance
- 16 personnel have been trained at various capacities including Project Coordinator, JRF, PA, and FW.
- Researchers have gained extensive knowledge from the rich field exposure
- A new 48V DC system configuration suitable for a rural electrification system is developed
- A patent has been filed based on the research output
- Two new commercial market suitable products have been developed







2. Analytics India Magazine

Read the latest interview by Dr Mathew Mithra Noel, Dean, School of Electrical Engineering, Vellore Institute of Technology and Shubham Bharadwaj, an alumnus of VIT, in Analytics India Magazine. In the interview, they discuss about their paper titled, 'Biologically Inspired Oscillating Activation Functions Can Bridge the Performance Gap between Biological and Artificial Neurons'. This paper proposes oscillating activation functions to overcome both the gradient flow problem and the XOR problem, essentially solving "classification problems with fewer neurons and reducing training time". Additionally, Praneet Dutta, also an alumnus of the university, volunteered to provide high-level guidance as an independent researcher on the proposal.

The full interview can be found here:

https://analyticsindiamag.com/how-oscillatory-activation-function-overcomes-problems-with-gradient-descent-and-xor/

Top Publications
January 2022

1) S V., Manoharn R., Ramachandran S., Krishnasamy V., Rajasekar V.R., P K., Kumar P., K A., Dhanabalan S.S., "An Efficient Lightweight Privacy Preserving Mechanism for Industry 4.0 Based on Elliptic Curve Cryptography", IEEE Transactions on Industrial Informatics, **IF** 10.215

2) Pamela J.S., Saranya R., Indragandhi V., Singh R.R., Subramaniyaswamy V., Teekaraman Y., Urooj S., Alwadai N., "2D Finite element analysis of asynchronous machine influenced under power quality perturbations", Computers, Materials and Continua, **IF** 3.772

3) Devan P.A.M., Hussin F.A., Ibrahim R.B., Bingi K., Nagarajapandian M., Assaad M. , "An Arithmetic-Trigonometric Optimization Algorithm with Application for Control of Real-Time Pressure Process Plant", Sensors, **IF** 3.576

4) Mujeeb Rahman K.K., Subashini M.M. "Identification of Autism in Children Using Static Facial Features and Deep Neural Networks", Brain Sciences, **IF** 3.394

5) Reddy A.K.V.K., Narayana K.V.L., "Investigation of a Multi-strategy ensemble social group optimization algorithm for the optimization of energy management in electric vehicles", IEEE Access, **IF** 3.367

6) Khasim S.R., C D., "Design and Implementation of Asymmetrical Multilevel Inverter with Reduced Components and Low Voltage Stress", IEEE Access **IF** 3.367

7) Bandla P.B., Vairavasundaram I., Teekaraman Y., Kuppusamy R., Nikolovski S., "Real Time Sustainable Power Quality Analysis of Non-Linear Load under Symmetrical Conditions", Energies **IF** 3.004

8) Das S., Prusty B.R., Bingi K., "Review of adaptive decompositionbased data preprocessing for renewable generation rich power system applications", Journal of Renewable and Sustainable Energy **IF** 2.219

9) Karimulla S., Ravi K., "Integration of Renewable Energy Sources into the Smart Grid Using Enhanced SCA", Intelligent Automation and Soft Computing, **IF** 1.647

10) Tripathy D.S., Prusty B.R., Bingi K., "A k-nearest neighbor-based averaging model for probabilistic PV generation forecasting", International Journal of Numerical Modelling: Electronic Networks, Devices and Fields, **IF** 1.296

Top Publications February 2022

1) Madhana R., Mani G., “Power enhancement methods of renewable energy resources using multiport DC-DC converter: A technical review”, Sustainable Computing: Informatics and Systems, **IF** 4.028

2) Krishnan V.R., Blaabjerg F., Sangwongwanich A., Natarajan R., “Twisted Two-Step Arrangement for Maximum Power Extraction From a Partially Shaded PV Array”, IEEE Journal of Photovoltaics, **IF** 3.887

3) Omar M.B., Bingi K., Rajanarayan Prusty B., Ibrahim R., “Recent Advances and Applications of Spiral Dynamics Optimization Algorithm: A Review”, Fractal and Fractional, **IF** 3.313

4) Sarojini R.K., Palanisamy K., De Tuglie E., “A Fuzzy Logic-Based Emulated Inertia Control to a Supercapacitor System to Improve Inertia in a Low Inertia Grid with Renewables”, Energies **IF** 3.004

5) Santosh Kumar Reddy P.L., Obulesu Y.P., Singirikonda S., Al Harthi M., Alzaidi M.S., Ghoneim S.S.M., “A Non-Isolated Hybrid Zeta Converter with a High Voltage Gain and Reduced Size of Components “, Electronics (Switzerland) **IF** 2.397

6) Padala L.S.K.R., Yeddula P.O., “A non-isolated switched inductorcapacitor cell based multiple high voltage gain DC-DC boost converter”, International Journal of Circuit Theory and Applications, **IF** 2.038

7) Ashok Kumar L., Indragandhi V., Teekaraman Y., Kuppusamy R., Radhakrishnan A., “Design and Implementation of Automatic Water Spraying System for Solar Photovoltaic Module”, Mathematical Problems in Engineering **IF** 1.305

Top Publications March 2022

1) Vamsi Krishna Reddy A.K., Venkata Lakshmi Narayana K., “Meta-heuristics optimization in electric vehicles -an extensive review”, Renewable and Sustainable Energy Reviews, **IF** 14.982

2) Laarabi B., Sankarkumar S., Rajasekar N., El Baqqal Y., Barhdadi A., “Modeling investigation of soiling effect on solar photovoltaic systems: New findings”, Sustainable Energy Technologies and Assessments, **IF** 5.353

3) Kanhirakadavath M.R., Chandran M.S.M., “Investigation of Eye-Tracking Scan Path as a Biomarker for Autism Screening Using Machine Learning Algorithms”, Diagnostics, **IF** 3.706

4) Mathew A.A., Vivekanandan S., “Design and Simulation of SingleElectrode Mode Triboelectric Nanogenerator-Based Pulse Sensor for Healthcare Applications Using COMSOL Multiphysics”, Energy Technology, **IF** 3.631

5) Yuvapriya T., Laskshmi P., Elumalai V.K., “Experimental Validation of LQR Weight Optimization Using Bat Algorithm Applied to Vibration Control of Vehicle Suspension System”, IETE Journal of Research , **IF** 2.333

6) Subramaniyaswamy V., Jagadeeswari V., Indragandhi V., Jhaveri R.H., Vijayakumar V., Kotecha K., Ravi L., “Somewhat Homomorphic Encryption: Ring Learning with Error Algorithm for Faster Encryption of IoT Sensor Signal-Based Edge Devices”, Security and Communication Networks, **IF** 1.791

7) Vivek P., Rekha M., Suvitha A., Kowsalya M., Steephen A., “Diamond morphology CuO nanomaterial’s elastic properties, ADMET, optical, structural studies, electrical conductivity and antibacterial activities analysis”, Inorganic and Nano-Metal Chemistry, **IF** 1.716

8) Muthuselvi G., Saravanan B., “Clustering-based Energy-aware Scheduling of Smart Residential Area”, Advances in Electrical and Computer Engineering, **IF** 1.221

Editorial Committee

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