



Face The Hardest Situations In Life With A Smile

Problems And Hardships Will Always Be There In Life. Most Of Them Make Us Stronger.

- AMMA

RESEARCH SPOTLIGHT

DEEP LEARNING TECHNIQUES FOR FAULT PROGNOSIS IN NUCLEAR POWER PLANTS

Faculty: Dept. of Electronics and Communication Engineering



Dr. R. Lavanya

r_lavanya@cb.amrita.edu



Dr. M. Nirmala Devi

m_nirmala@cb.amrita.edu



Dr. Jayakumar.M

m_jayakumar@cb.amrita.edu

Nuclear Power Plants (NPP) employ a large number of sensors for monitoring the plant performance. Fault diagnosis in NPP is thus a multivariate problem, involving measurements of a large number of variables. Data driven techniques are effective in mining useful information from large datasets, by exploring the interdependency among multiple variables. Unlike conventional data-driven approaches, Deep Learning (DL) can discover latent structures within the raw data automatically, eliminating the need for manual labour and high quality expert knowledge to generate hand-crafted features. DL involves the use of neural network architectures with multiple hidden layers to solve complex problems. Deep neural networks (DNN) exhibit feature hierarchy and learn features of increasing complexity and abstraction with increasing network depth. Further, certain DNN architectures are capable of capturing long-term dependencies from temporal data, which renders them a prospective for predictive fault diagnosis in NPPs. This research proposal aims for automated fault prognosis using DL techniques for monitoring of individual sensors and transients in NPPs, using measurements from selected sensors of interest.

STUDY ON IMPACTS OF RECENT EL-NIÑO SOUTHERN OSCILLATION ON THE WATER-FOOD-ENERGY NEXUS IN SOUTH ASIA



Facutly: Dr. B Soundharajan,

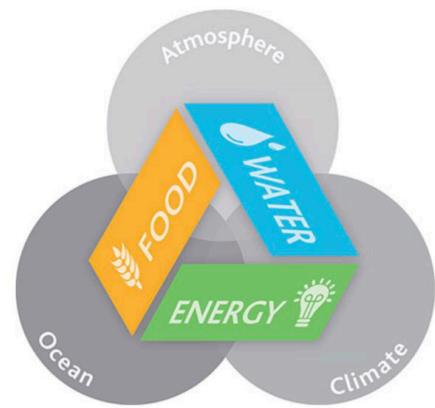
Dept. of Civil Engineering

b_soundharajan@cb.amrita.edu

The research funded by Swedish Research Council aims to advance the current understanding of the impacts of the latest El-Niño on the water-food-energy nexus in low and middle-income countries and increase the preparedness as well as resilience to future events. India's agriculture, economy, water resources and societal well-being are heavily relying on the Indian summer monsoon rainfall (ISMR). But ISMR is strongly influenced by the El-Niño Southern Oscillation (ENSO) phenomenon and most of the historic droughts over India were associated with El-Niño. The most recent El-Niño event during 2015-2016 was one of the strongest and longest events on record, during which many regions suffered from rainfall deficits, which affected

food, energy and water security as well as livelihoods of local communities and farmers in particular. Given the importance of reservoirs and dams for a continuous year-round water supply, irrigation and hydropower generation in India and neighbouring countries, there is an urgent need to assess the impact of El-Niño on the complex water-food-energy nexus. For a region like South Asia, which is under rapid economic development, this need is even more central and calls for an urgent assessment of the role of operating policies in balancing the competing demands for irrigation supply, ecosystem services and hydropower generation.

Dr. B Soundharajan, Department of Civil Engineering, who is involved in this collaborative project along with Uppasala University, Sweden reckons that this research will foster a more sustainable development of the water sector through enhanced management and operational policies, which in turn will increase preparedness as well as resilience of local stakeholder to future El-Niño events and their impacts on the complex water-food-energy nexus.



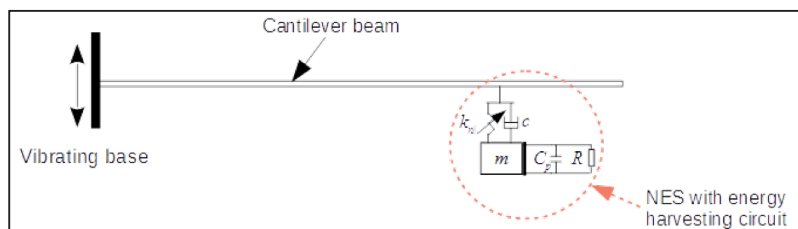
MATHEMATICAL MODEL TO BUILD MULTIFUNCTIONAL ENERGY HARVESTING SYSTEM.



Faculty: Dr. B. Santhosh

Dept. of Mechanical Engineering

b_santhosh@cb.amrita.edu



The possibility of self-powered sensors with the energy derived from its own working environment is an area of active research owing to many significant applications which could utilize this technology. One common source that is being widely researched is the harvesting of vibration energy from different

sources. Use of nonlinearity in different forms to enhance the performance of linear vibration absorbers and energy harvesters have been investigated in the past. Nonlinear energy sink (NES) is an essentially nonlinear element, which when used as a vibration absorber is effective over a wider band of frequencies. When NES is attached to a vibrating system, the energy will be transferred from the host structure to NES, confined to NES and dissipated by damper. This work, aims at extracting the energy confined to NES by a suitable transduction mechanism. The system exhibit modal interactions and understanding them theoretically and experimentally is essential in order to develop efficient energy harvesting techniques. The major objectives of the project include the development of a mathematical model for a combined absorber harvester system with NES, understand the modal interactions and the development of an experimental setup to correlate the analytical/ numerical findings. A generalized design methodology for multifunctional energy harvesting systems will be developed based on the studies. Potential applications of the proposed study include vibration attenuation of spacecraft, seismic vibration reduction of buildings and provide alarms during earthquake, vibration reduction of bridges from vehicular traffic, structural health monitoring and harvest energy from human motion to self-power human implants.

MULTI MODEL THERANOSTIC FOR TUMOR HYPOXIA - A CLINICALLY VIABLE STUDY.

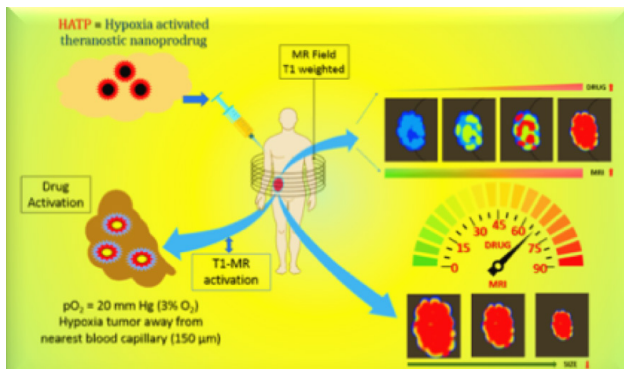


Faculty: Dr. Sankarprasad Bhuniya,

Research Professor at Amrita Center for Industrial Research & Innovation and

Amrita Center for Excellence in Advanced Materials and Green Technologies.

b_sankarprasad@cb.amrita.edu



Hypoxia is the pre-metastasis condition of all types of cancers, due to inadequate oxygen levels ($\leq 3.0\%$), and is an important impediment to effective cancer therapy. The mortality rate is highest in comparison to any type of cancer and the acidic features and expression of tumor resistance parameters make them almost incurable. Even though many hypoxia-activated prodrugs (HAP) are in the advanced stage of the clinical trial; FDA has not approved them because of the severe cytotoxicity against

healthy cells. In this study, a paramagnetic polymer hybrid nano-device will develop by judicious selection of suitable chemical architectures. It can interact with overexpressed endogenous reductase enzymes in hypoxic tumors. Consequently, nanodevice will be disintegrated to facilitate chemotherapeutic release. The sequential 'turn-on' visual (fluorescence) and T1-MR modalities of the nano-delivery system will provide the information on the real-time of drug release and its activation. At the same time, at the variable magnetic field, hyperthermia will show synergism with chemotherapy to get a maximum clinical benefit. Finally, it will provide real-time feedback on the efficacy of targeted therapeutic interventions by multi-modal readouts such as optical and MR (T1/T2) signal; the theranostic nanomedicines can be used to facilitate (pre-) clinical efficacy analysis, and to approach personalized medicine. It is a unique strategy; MRI can activate drug release and concurrently monitor tumor suppression noninvasively.

BEHAVIOURAL MODELLING OF HIGH-POWER AMPLIFIERS

Faculties:



Dr. Dhanesh G. Kurup (PI)

Professor,
Dept. of Electronics & Communication Engineering
dg_kurup@blr.amrita.edu



Dr. Sanjika Devi

Assistant Professor,
Dept. of Electronics & Communication Engineering
r_sanjika@blr.amrita.edu

High power amplifiers (HPA) operating in non-linear region enables us to achieve higher power added efficiency (PAE) in satellite communication systems. However, non-linear HPA introduces signal distortions leading to increased Bit Error Rate (BER) for bandwidth efficient modulation schemes such as higher order QAM. Proposed research offers a solution to the above problems by aiming to: Develop efficient non-linear behavioral models of PA from CAD simulations such as ADS or measurements of the PA. The behavioral model can then be used for estimating BER in system level simulations which includes PA and Apply behavioral models for designing Digital Pre-Distortion (DPD). DPD enables us to reduce signal distortions and thereby reduce BER. For implementing DPD, Field Programmable Gate Array (FPGA) based digital hardware would be used prior to the PA. The behavioral modeling technique and experimental knowledge gained in the area of DPD will be shared with ISRO and fine-tuned to specifications of ISRO for on-going and future satellite communication systems.

TECHNOLOGY DEMONSTRATION PROJECT ON FUTURE ELECTRICAL DISTRIBUTION SYSTEM.



Faculty: Dr. Kanakasabapathy,

Associate Professor,
Dept. of Electrical & Electronics Engineering
sabapathy@am.amrita.edu



This proposed project funded by Board of Energy Efficiency, Ministry of Power, Government of India, focuses on the techno-commercial and regulatory challenges faced by the electric utilities in meeting the ambitious targets for enhancing the Grid interactive Distributed Renewable Energy Generation (REG) and improvements in end-use energy efficiency.

The project aims at revealing the effects of grid extensions as a function of the penetration and degree of mix of renewable energy and energy efficiency. The project will be contributing to the validation of the effectiveness, flexibility and accuracy of the developed model for solving the problems in distribution planning and network expansion on a long-term perspective.

TECHNOLOGY CONTRIBUTION FOR COVID-19

ICT ENABLED INTEGRATED RURAL NUTRITION CENTRE WITH FOCUS ON COVID -19

Faculties:



Dr. Janci Rani P. R
Dept. of Sciences
b_janci@cb.amrita.edu



Dr. Vidhya Balasubramanian
Dept. of Computer Science & Engineering
b_vidhya@cb.amrita.edu



Dr. Rajathilagam
Dept. of Computer Science & Engineering
b_rajathilagam@cb.amrita.edu



Dr. Dhanya.N
Dept. of Computer Science & Engineering
nm_dhanya@cb.amrita.edu



Dr. Tharani Devi
Dept. of Sciences
n_tharanidevi@cb.amrita.edu

An Integrated Rural Nutrition Centre (IRNC) is being made at public access points between selected villages. The centre will focus on livelihood improvement activities for SC/ST, Rural households through appropriate food processing technology solutions, promote nutrition garden and indigenous seeds, fruits/vegetables, herbs, medicinal plants and Nutri Enterprises models. An Information



and Communication Technology enabled IRNC, using GIS based mobile applications, image processing, AI & data analytics is also being established. IRNC will serve as

behavioural change agent and knowledge dissemination centre for nutrition resource and data bank along with targeted dietary counselling and referral service point to vulnerable groups. Nutritional Health and Wellbeing of the selected community will be ensured through improved diagnosis and dietary diversity practices, better utilization of locally available food resources and through promoting nutrition garden.

In addition to the above the project team is working on COVID19 Emergency action plan in three stages such as immediate (During lockdown), intermediate (Short term-after lockdown) and long term (Throughout the project period) activities and intervention. A Tele consultation team works with Pregnant and Lactating mothers of less than 2 yr old children to primarily make them aware on the pandemic and suggesting ways on social distancing, effective sanitisation, food to improve immunity preparation of ayurvedic home remedies and Supply of essentials for the needful. A mobile application is designed for educating people on COVID19 pandemic through video tutorial and the app evaluates the user on the gained knowledge.

AMRITA VENTILATOR CONTRIBUTES FOR COVID 19



Dr. Manjula G. Nair,
Dept. of Electrical and Electronics Engineering.
manjulagnair@am.amrita.edu

**Faculty : Mr.Akhil M.S, Mr. Bharath K T,
Mr. Unnikrishnan Pillai P., and Mr. Srinivasan M. K.**
Dept. of Electrical and Electronics Engineering



To cater to the unprecedented pandemic the world is facing. Amrita faculty have developed a cost-effective ventilator for COVID-19 patients. The ventilator prototype was designed at a lower cost to match the requirements for India and could be apt for low-economy countries. The model is based on a Bag Valve Mask (BVM), sometimes known by the proprietary name Ambu bag or "self-inflating bag", a device commonly used to provide positive pressure ventilation to patients who are not breathing or not breathing adequately.

TECHNOLOGY TO REDUCE DIRECT INTERACTIONS WITH COVID19 PATIENTS



Faculty: Dr. Maneesha V. Ramesh

maneesha@am.amrita.edu

maneesha@amrita.edu



Faculty at #Amrita are utilizing the national lockdown to innovate new products and hacks to help in the fight against #COVID-19.

The majority of Amrita's innovations focus on protecting those on the front-lines of the war against #coronavirus, specifically, for the doctors and nurses caring for #COVID patients.

Dr. Maneesha Ramesh, Dean International Programs and her team from WNA have come up with a method of using smartphone cameras to remotely monitor the vitals of coronavirus-infected patients. They have developed a method of connecting smartphones with medical-server software to reduce the direct interaction of hospital personnel with the infected patients. The systems functions to track the vitals and patient-doctor communication is done remotely, The medical team is alerted whenever there is a trouble or spike in vitals.

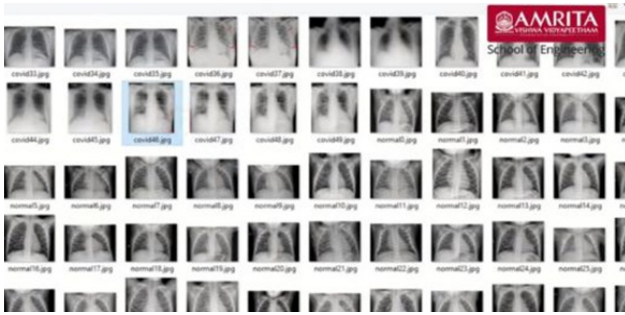
AMRITA DEVELOPS AMRITA FLY-MED SYSTEM



A team of researchers from Amrita Vishwa Vidyapeetham have developed the Amrita Fly-Med System, a safe and reliable hybrid drone system for delivering medical aid. The ongoing COVID-19 pandemic is the defining global health crisis of our time. The lockdown and the need for individuals to be quarantined is catalysing the health sector to develop solutions for the delivery of medical aid and other emergency supplies. Most of the existing drone systems can only fly short-distances. The Amrita Fly-Med System combines long-distance service range with the ability to make

deliveries to one's doorstep. It can deliver packages to specified GPS locations, thereby aiding stranded victims. In order to deliver its packages to ground level, the drone is equipped with a drop mechanism comprising of bamboo and string that safely drops the package. The Amrita Fly-Med System prototype has undergone flight tests under India's regulatory drone flight frame. It has been designed for short setup time and affordability.

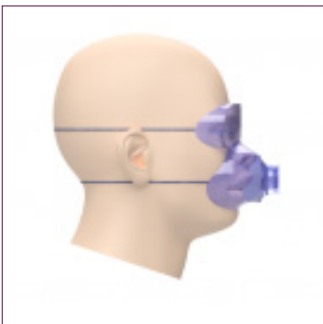
STUDENTS DEVELOP APP TO PREDICT COVID-19



details and his/her current location are appended to the blockchain as a transaction for authorities to monitor. They allow us to collect the Aadhar details, phone number, name and GPS coordinates of test location, etc., and for safety and tamperproof storage, are moved to the Blockchain. Once the patient has recovered, the status gets changed as COVID-19 negative and they believe that this as a 100% viable approach. They give 95% accuracy in classifying pneumonia/non-pneumonia and almost 100% accuracy to detect the COVID-19 positive cases. The app facilitates reduced load on doctors, reduced time of identification of probable candidates, using test kits only on most probable suspects, affordability and easy of use.

Nitin Dantu, Vimalkumar, Dana Vishnu along with their mentor Dr. Shriram K. Vasudevan (Assistant Professor, Department of Computer Science and Engineering, Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Coimbatore campus), developed Diagnostix, an app to classify COVID-19 positive and non-COVID-19 patient X-rays using deep learning algorithms and blockchain. The app is a web/mobile platform with complete diagnostics that allows users to upload X-ray images and the system then predicts. In case the result turns out to be COVID-19 positive, the patient's

AMRITA B.TECH STUDENTS DEVELOP LOW-COST FACE MASKS TO FIGHT COVID-19



Protective masks are mandatory and an effective way to fight against COVID-19 or Coronavirus pandemic. The raising number of cases and usage of masks makes it necessary to have it made cost effective and reusable. A group of three students, Raj Praveen, Venkadasubramaniyan and Harisudhan, pursuing B. Tech Mechanical Engineering degrees from the School of Engineering, have developed face masks for fighting against the COVID-19.

This mask is reusable and the filtering element can be changed as needed. This device can be used in varying situations by only changing the filtering element. With any simple piece of cloth for a filtering element, a common person can be benefited. This same mask, with an advanced filtering element, can benefit doctors and other medical personnel, as it provides an integrated fool proof system that protects the user from exposure to microbes through mucus-filled regions of nostrils, mouth and eyes.



AMRITA TEAM EXCELS AT ELGI TECHNOLOGY

ELGI Equipment, Coimbatore, India celebrated its 2nd edition of the "State of the Future Art" themed Technology Day. The event saw participation, the academia, and students from over 20 engineering colleges across India and industry thought leaders. Students were invited to author papers on "Energy efficiency and creating a greener environment". This contest received more than 50 papers from engineering colleges across India which were evaluated and filtered at three levels through presentation followed by Q&A sessions. The three papers were selected as best paper for presentation for the Technology Day and that included "VFD Reliability

Improvement - Grid Related Issue Causing Drive Failure?"; a paper from Amrita School of Engineering,. Ms Janani Sunil, Mr Sivakumar S and Mr Sidharth Easwar of 1st Year M Tech Power Electronics presented this paper based on their study under the guidance of Dr. A Vijayakumari, Associate Professor, Electrical & Electronics Department. The top technical people of ELGI appreciated the work following an involved technical interaction. ELGI offered an internship for any one of the team members to carry out his/her M Tech project on the same topic.

TECHNOLOGY TO CONVERT SINGLE-USE PLASTICS INTO USEFUL PRODUCTS



Mr. Akash Vineet, Mr. Akash Jayakumar and Mr. Abhihas Balaji, Alumni, Department of Aerospace Engineering, guided by Dr. Shantanu Bhowmik (Professor, Department of Aerospace Engineering,), developed a technology to convert single-use plastics into products like floor tiles, roof

tiles, etc. They were supported with grant from Amrita TBI (Technology Business Incubator) and have incorporated a recycling start-up R-Cube Plastics incubated at Amrita TBI. They have developed low cost and low weight roof tiles and pavement tiles. A single pavement tile that could withstand up to 2 tonne of compressive load. The strength of the product is equivalent to concrete, which is made from 100% recycled plastic. The major disadvantage of recycled plastics is its quality and strength. By this process, recycled products can be provided to customers with better property at a lower cost than virgin plastics. The solution can be applied to all the major plastics in the plastic industry namely LDPE, HDPE, PET, PP.

AMRITA TEAM BIOS MEMBER DISCOVERS SECURITY BUG IN QEMU

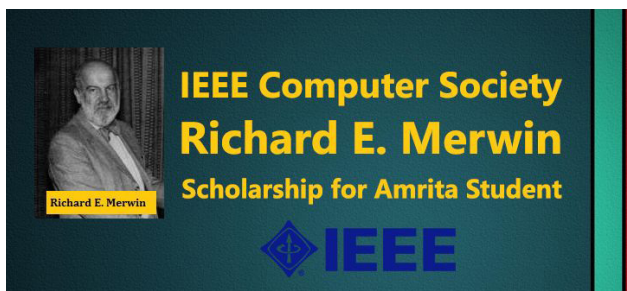
Vishnu Dev T.J., a third-year security enthusiast, from team bi0s, the academic ethical hacking team of Amrita Vishwa Vidyapeetham, Amritapuri Campus, discovered a security bug in QEMU which can be triggered by sending specially crafted network packet and can lead to fatal full system compromise. QEMU (Quick EMULATOR) is a free and open-source



emulator that performs hardware virtualization. On reporting the bug, he was issued with a Common Vulnerability Exposure id CVE-2020-7039 which is a

heap buffer overflow in the network backend of QEMU (SLiRP). This bug can be weaponized to create Denial of Service (DoS) attack or get remote code execution (RCE) on the host system. Exploiting such bug enables an attacker to extract sensitive information from the host or other VM running on the same host. The bug was found through code review and was reported to Red9 Hat.

AMRITA STUDENT WINS RICHARD E. MERWIN SCHOLARSHIP



Mr. Deepak N. of BTech Electronics and Communication Engineering and Chair of Amrita IEEE Student Branch of Amritapuri Campus, recently won the coveted Richard E. Merwin Scholarship Award from IEEE CS, Washington D.C., USA. The award consists of a customized certificate from IEEE headquarters in the USA, USD 1000 cash, three years of free IEEE Computer Society membership and an opportunity to serve as a student ambassador for the IEEE Computer Society.

AMRITA STUDENTS WIN TECHNOLOGY INFUSION GRAND CHALLENGE GRANT

A student team won a grant from Technology Infusion Grand Challenge, organized by La Trobe University (Australia), to build a prototype on intelligent water supply system using AI and IoT. The team named "Aqua1" consisted of Aadithyaa M. (Department of Civil Engineering), Gopikrishnan K. (Department of Electronics and Communication Engineering) and Vejay Karthy (Department of Computer Science and Engineering) guided by Dr. B Soundharajan (Associate Professor, Department of Civil Engineering).



The Technology Infusion Grand Challenge is meant for solving pressing social problems and this year's theme was 'Smart City Innovation. Water security is a burning issue in the urban Indian population, the availability of water for even drinking becomes a question during the summer seasons. Considering the exponential population growth and rapid migration to cities in India, extreme water stress is inevitable in the next few decades. The adversity of the issues could be managed to a greater extent through improved water management measures. To achieve this, the team proposes a solution to create a self-evolving sensor based network which helps to improve the urban drinking water supply system.



AMRITA HUT LABS SUCCESSFULLY DEPLOYS IOT BASED CROP PROTECTION SYSTEM

One of the biggest problems farmers face in India is the attack on crops by wild animals in their fields. The damage from these attacks significantly and adversely affects the crop yield.

To counter the attack and threat, Humanitarian Technology (HuT) Labs of the Department of Electronics and Communication Engineering (ECE), designed a solar-powered, IoT based intelligent system that can be used to prevent crop damage due

to wild animals. The system implements IoT technology along with simple sensors. It makes use of four junction boxes that are central to the system architecture. Each box hosts either two lasers or two LDR sensors.

The GSM module enables the system to send a message to the farmer when the system is triggered by an animal intrusion. This system automatically detects the animals before they enter the field using the laser system and scares them away by flashing lights and also by an alarm. In addition, the system is safe for animals. The proposed system can improve the yield of crops and in turn help farmers to increase their income. This system also indirectly helps the farmers by allowing them to sleep well at night as there is no need for them to keep patrolling their fields. This project is funded by IEEE SIGHT. The team comprised of students from Semester 4 of B. Tech. Electronics and Communication Engineering: Kondareddy T., Gautham P., Sreejith R. Pai, Samudrala Naveen and Kavya K. Sajan, under the guidance of Dr. Rajesh.

AMRITA STUDENT TEAM WINS IEEE ASIA-PACIFIC REGION HUMANITARIAN TECHNOLOGY PROJECT COMPETITION

A student team, "Team Bend" from the Department of Computer Science & Engineering (CSE), has won the IEEE Region 10 (Asia-Pacific region) Humanitarian Technology Project Competition 2019 held at the University of Indonesia, Depok. Since 2013, this international project competition has

been held in conjunction with the premier IEEE R10 Humanitarian Technology Conference (HTC). Team Bend developed a Virtual Reality (VR) game to reduce lower back pain which is rampant among young professionals, especially for those working long hours in coding at IT and service companies. With the tagline for their project, "Gaming is not an addiction but a therapy", "Team Bend" competed against student innovators from countries such as Japan, China, Indonesia, Singapore, and Malaysia to emerge on top of this Engineering Festival for Humanity. "Team Bend" members are Kishore Ramesh, Mohan Karthik V., Nehal Ram Surya B. and Ragul P., all students of the 2016-2020 batch of B.Tech Computer Science & Engineering (CSE). Coimbatore Campus.



INTERNATIONAL MOUS & WORKSHOPS

MOU FOR EDUCATION AND RESEARCH WITH UNIVERSITY OF ARIZONA.



In one of the largest ever international university collaborations in India, a Letter of Intent (LoI) was signed by the Chancellor, Sri Mata Amritanandamayi Devi, and Dr. Liesl Folks, Provost and Vice President of Academic Affairs, University of Arizona. The LoI seeks to initiate multidisciplinary collaborations for the highest standard curriculums leading to integrated and dual-degree programs at the bachelor's and master's levels. The key disciplines include Engineering, Biotechnology, Nanotechnology, Social Sciences, Medicine, Public Health, and Agriculture. The program will enhance Amrita as the study-abroad site for the University of Arizona students and vice versa. This will engage more than 200 students annually for a minimum of one semester at the two-partner university.

AMRITA-TEL AVIV UNIVERSITY SUSTAINABLE DEVELOPMENT WORKSHOP HELD



Amrita in collaboration with Tel Aviv University, Israel held a workshop on water in the context of sustainable development. The workshop participants were trained to enable them to deal with complex phenomenon, knowledge on methods for sustainable development, knowledge of natural and social conditions, as well as limits towards sustainable development. Prof. Tammie Ronen (Head of the Renata Adler Memorial Research Center for Child Welfare and Protection at the Bob Shapell School of Social Work, of Tel Aviv) made the opening remarks. Prof. Hadas Mamane addressed on "A Broad Overview of the Global Water Challenge, Globally, India and Israel". Prof. Neta Ziv, addressed on Water and SDG 6 and on water regime and water rights in India. Prof. Tamar led a review session. Prof. Bhavani Rao addressed on "Cultural Dimensions of Water". A series of Talks were held on Water Technologies by Dr. Hadas Mamane (Tel Aviv), Dr. Sanjay Pal (Amrita School of Biotechnology), Dr. Maneesha Ramesh (Amrita WNA), Water Resource Management by Dr. Harikumar P. S, Behavioral Change by Dr. Tamar, The Workshop closed with a discussion on 'The Road Ahead' and Indo-Israeli collaboration.

SCICON 19 INTERNATIONAL CONFERENCE ON MATERIAL SCIENCE



The second edition of SCICON, International Conference on Advanced Materials, was held at the University. It provided a platform for scientists and researchers all around the globe to communicate their ideas and share their research in the field of material science with the public. The inaugural ceremony was carried out with Prof. Amlan J. Pal (Senior Professor, Indian Academy for the Cultivation of Science) and Prof. Mohan

Srinivasarao (Professor, Materials and Science Engineering, Georgia Institute of Technology), Member, Scientific Advisory Committee, SCICON 2019, releasing and receiving the abstracts respectively.

The three-day conference saw eminent researchers from countries like Canada, USA, Thailand, France, Italy, UAE, Bangladesh, South Korea, Hungary, Singapore, and several parts of India congregate to share their expertise in areas such as biomaterials, electronic and magnetic materials, as well as high energy materials. With 12 plenary lectures and 34 invited talks that included parallel sessions on Basic Sciences, Materials for Energy Applications, Computational Materials, Electronic and Magnetic Materials, Biomaterials and Nanomaterials, the conference was a hub for an intensely diverse approach to science and technology. The pantheon of speakers discussed topics of contemporary research interest, with the majority emphasizing a sustainable approach to science and technology and the development of novel materials for applications in the same, which was in line with the conference theme 'Materials for Better Living'.

AMRITA-TU DELFT WORKSHOP

Amrita Vishwa Vidyapeetham, in collaboration with Delft University of Technology (TU Delft), Netherlands, organized an Amrita-TU Delft Workshop on Sustainable Water Management. The joint workshop was intended to provide a platform for Indo-Netherlands researchers to collaborate and exchange their research capability and design a research pathway to develop future sustainable solutions in the area of sustainable water management. The research pathways were envisioned to empower rural and urban communities and the Amrita-TU Delft community to address the UN sustainable development goals such as good health and wellbeing, quality education, clean water and sanitation, sustainable cities and communities and partnerships for the goals. Prof. Dr. Jules Van Lier (Professor, Environmental Engineering) and Dr. Saket Pande (Assistant Professor, Civil Engineering) were the collaborators from TU Delft.

The primary goals of the collaborative research initiative were providing clean water availability and safe hygiene conditions for rural and urban



communities through the Live-in-Labs program and the Jivamritam project: a community-based solution for clean drinking water. These research initiatives addressed four major themes such as water systems, water treatment, technology adoption, and water hazards in communities across the nation.. A joint supervisory doctoral committee with faculty from both Amrita and TU Delft was constituted to guide each of the Ph.D. students in the program. All Ph.D. students were funded for four years and had the opportunity to be at TU Delft for more than six months along with the Amrita faculty guiding their research.

AWARDS AND RECOGNITIONS



'BEST INSTITUTION OF THE YEAR - TECH & INNOVATION ECO-SYSTEM'

The School of Engineering has been conferred the award of 'Best Institution of the Year - Tech & Innovation Eco-system' at the Computer Society of India's (CSI) Tech Next India 2019 event held at Mumbai. This award is in recognition of the spectacular hackathon successes at Amrita in the last couple of years, as well as the support system facilitating the same such as Cisco ThingQbator IoT Makerspace, Institution Innovation Council (IIC), Anokha techfest, and competitive programming initiatives like ICPC.



BEST FACULTY OF THE YEAR - THOUGHT LEADER AWARD

Dr. Shriram K. Vasudevan, (Assistant Professor, Department of Computer Science & Engineering (CSE), School of Engineering, Amrita Vishwa Vidyapeetham, Coimbatore campus), was conferred the award for Best Faculty of the year - Thought Leader award for his prolific mentoring of Amrita CSE hackathon teams with successes and victories in TCS EngiNX, NEC Hackathon, Rackathon, TITAN Wear your smarts, Tata Crucible Hackathon and Health Hack, etc.



FACULTY OFFERED ADJUNCT PROFESSOR AT GRENOBLE INSTITUTE OF TECHNOLOGY

Dr Ramu Murugan, Associate Professor, Department of Mechanical Engineering has been offered the distinguished position of Adjunct Professor in the School of Industrial Engineering, Grenoble Institute of Technology, Grenoble, France. As part of this assignment, he will be carrying out research in the field of Additive Manufacturing at G-SCOP Research Centre with Prof. Phillippe Marin, Grenoble Institute of Technology and offer a PG level course on 'Additive Manufacturing of Composite Materials'



FACULTY PUBLICATION REFERENCED IN THE UK PARLIAMENT.

Mr. Dominic Cummings, Chief Political Strategist for Mr. Boris Johnson, Prime Minister of United Kingdom wrote a blog suggesting the need to revamp the decision making strategies employed in UK. Primarily he focused on the need to explore and exploit state of the art tools and techniques from mathematics and physics. Mr. Cummings wants to create a set of experts consisting of Physicists, Mathematicians and Data Scientists to deal with the major social and economic issues of UK. Mr. Cummings cites a list of important publications in order to support his claim of exploring the novel and non-conventional tools. He suggests "that the aspirants desirous of participating in this exciting task with No: 10, Downing Street should go through the publications that he has listed." The first paper listed is by Dr. Gopalakrishnan (Assistant Professor, CEN, Amrita Vishwa Vidyapeetham). as a part of his PhD work in IIT Madras along with his PhD supervisor Prof. R. I. Sujith. They applied the tools from nonlinear dynamics to develop robust precursory measures for detrimental transitions observed in canonical thermoacoustic systems.