AMET

ACADEMY OF MARITIME EDUCATION AND TRAINING

28 Years

DEEMED TO BE UNIVERSITY

(Under Section 3 of UGC Act 1956)

ELECTRIKA

2020

ANNUAL MAGAZINE 2019-2020

THE DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ABOUT THE UNIVERSITY

AMET is India's first Deemed to be University in Maritime Education which is ranked as 3rd among Maritime Universities of the World in the PIMET (Performance Indicators in Maritime Education and Training) Ranking of International Association of Maritime Universities (IAMU). Established during 1993, AMET's uncompromising strides of excellence in the field of maritime education and training laced with its capacity to feed the global shipping industry with an unrivalled maritime human resource secured it to have many national and international recognitions, accreditations and rankings such as NAAC, NIRF, ARIIA, DGS-CIP, PIMET etc.

AMET serves as an ocean of knowledge for over 4000 students pursuing Programmes ranging from diploma to Doctoral programs through 9 schools and 23 intensive research and training centers for marine and marine related activities. Equipped with an excellent infrastructure for research and development, co-curricular and extracurricular activities AMET secured its compliance certificate for ISO 9001:2015 QMS standards from the prestigious and globally renowned DET NORSKE VERITAS, Norway.

For over two decades AMET is remaining as the favourite destination for campus interviews by many shipping giants such as AP MOLLER MAERSK, GOODWOOD, NYK, SONANGOL, VSHIPS, WALLEMS, SHELL, CHEVRON, STENA and so goes a list of over 100 companies. Besides positions onboard, AMET Business school graduates have secured lucrative jobs in commercial shipping sectors such as chartering and ship broking. Never the less, Naval architecture, petroleum engineering, harbor engineering, marine electrical and electronics engineering graduates have successfully walked away from AMET with jobs offering sumptuous packages along with an opportunity to grow and glow in their career swiftly. Needless to say

about the entrepreneurship development activities nurtured into AMET'ians has been found rewarding by students who are chief executive officers of their own organization.

VISION AND MISION OF THE UNIVERSITY

VISION

To sustain identity as a World Class Leader in Maritime Education and empower learners with wholesome knowledge through progressive innovation in training, research and development which will render students a unique learning experience and a transformation impact on the Global Society.

MISSION

AMET will strive continuously to

- Impart value-based higher education and technical knowledge with uncompromising strides of an outstanding quality.
- Emerge as a Centre of Excellenceinculcating skill development in recent technologies in accordance with industrial trends.
- Create World class research capabilities on par with the finest in the world and broaden student's horizons beyond classroom education.
- Nurture talent and entrepreneurship to enable all round personality development among students.
- Empower studentsacross socio economic strata
- Make a positive difference to society through technical education.

QUALITY POLICY

AMET is committed to provide the highest quality in education and be the mostpreferred institution for pursuing marine and marine-related courses.

This will be achieved by a consistent focus on:

- Providing a conducive, vibrant, progressive and enriching learningatmosphere.
- Teaching Excellence and Research Output.
- Global outlook and engaging with the world through learning, teaching andresearch.
- Providing competitive advantage in gaining employment for furtheracademic opportunities.
- Maintaining excellent links with commerce and industry both national andinternational.
- Complying with all applicable requirements and continually improving theeffectiveness of the Quality Management System.

ABOUT THE DEPARTMENT

The Department of Electrical and Electronics Engineering is constituted and administered to provide a professional atmosphere for scholars, students, educators and engineers to enrich the discipline of Electrical, Electronics and Marine Engineering. The Department offers a well-balanced undergraduate Electrical and Electronics Engineering -Marine program and postgraduate M-E (Power Systems) program and PhD- Electrical and Electronics Engineering program of technological and scientific study designed to serve the professional needs of the baccalaureate.

The Department gives opportunity to learn marine related courses for the students and pursue studies related to the scientific concepts, technological advancements and design principles of Electrical and Electronics Engineering pertaining to Onshore and Offshore applications as well. This programme is designed to enable the Engineers coming out of the stream to work on board the ship as Electrical Engineers. Jobs with shipyards, dry docks, ship machinery manufacturers are some of the other fields they can look into.

ESTABLISHMENT:

Department of Electrical and Electronics Engineering is established in the year 2008 with the objective of imparting quality education of international standards and to produce highly innovative Marine Electrical and Electronics Engineers capable of solving global maritime challenges. Since its inception in the year 2008, the Department has grown steadily and acquired the present shape with excellent infrastructure, modern equipment for the laboratories and

qualified and dedicated faculty to impart sound technical knowledge to the enthusiastic student community. As on date, the Department has successfully produced four batches of talented graduates who are serving in prestigious shipping industries and organizations.

The Department offers 4 years U.G program in EEE-Marine, PG program in M-E (Power Systems) and PhD in interdisciplinary Engineering domains. The Department is headed by Dr.T. Sasilatha, Professor and Dean and supported by a team of well qualified, experienced and dedicated faculties. The Specialization of staff members span around major areas in Electrical and Electronics Engineering including Marine Automation, Power Systems, Electronic Navigation Systems, Offshore Energy Systems, Electrical machines, Energy studies, Control Systems, Power Electronics, Applied Electronics, Embedded Systems, Electrical Drives and VLSI Design.

PROGRAMS OFFERED:

- B.E - Electrical and Electronics Engineering-Marine – 4 Years
- M.E - Power Systems – 2 Years
- Ph.D – Electrical and Electronics Engineering, Interdisciplinary Domains (Full time and Part time)

VISION AND MISSION OF THE DEPARTMENT

VISION

To emerge as a Centre for higher learning and research through development of highly competent, innovative and world class Marine Electrical and Electronics Engineers while remaining sensitive to ethical, societal and environmental issues.

MISSION

- To impart quality education in order to produce highly innovative, socio- economically conscious Marine Electrical and Electronics Engineers.
- To provide knowledge and skills, that is essential to meet the local and global demands in Marine Electrical and Electronics Engineering.
- To upgrade student's technical knowledge through industry interaction activities.
- To foster strong ethics, positive attitude and transform the Department into Centre of Excellence by promoting world class research and development to meet the challenging needs of society.
- To motivate and guide students for developing entrepreneurship or pursue higher education and train them for overall personality development.

Educationists should build the capacities of the spirit of inquiry, creativity, entrepreneurial and moral leadership among students and become their role model

A.P.J ABDUL KALAM

DEAN'S PROFILE

Dr.T. SASILATHA M.E, Ph.D.

It gives me immense pleasure to release the current issue of the Technical magazine "Electrica" for the Academic Year 2019-2020. This is a productive technical material and subsidiary skill developing tool for the students.

Engineering is a great outlet for the imagination-the perfect zone for independent thinkers. True Engineering education is not just providing ample facilities to the students, it is a platform where hidden talents /imaginations are converted into the real and creative world. It helps to build teamwork and work with all kinds of people inside and outside the field, whether they are designers or architects, doctors or entrepreneurs.

Having said that, I am sure that this current issue will lighten up your spirits not only on the technical frontiers but also provide an insight of co-curricular and extracurricular activities conducted both at the international and national level as conference and faculty development programmes. Adding to the galore are the value-added seminars and workshops conducted for students at a part of the institute -industry interactions. The edition also enlists students' achievements and their participation in the intercollegiate conference, seminars, workshops, and also in various sports meet and much more. The magazine will aptly revive fond memories of all the achievement to reminisce and to remind upon the future targets.

I am sure the magazine will be informative and resourceful. I applaud the coordinators and efforts behind the team in bringing out this issue. I wish them all success!

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GLIMPSES OF THE YEAR

AICTE Sponsored National Conference on Recent Advances in On-Board Ship Automation (RAOBSA-2019) was conducted on the 26.09.2019 and 27.09.2019. Dr.A. Ajeeth Singh Assistant Director Research, Institutional & Faculty Development (RIFD), All India Council for Technical Education (AICTE), New Delhi inaugurated and delivered the Chief Guest address. Mr Janaki Raman Ganesan Chief Executive Officer (CEO), Vik- Sandvik, Chennai was the Guest of Honor. The primary objective of the conference was to promote research in Smart Sensor, IoT, Cyber-Physical Systems, Artificial Intelligence, Machine Learning, Robotics, etc. The conference paved a platform to discuss the present challenges and future opportunities in the next-generation automated ships.

Experts from the International Electrical and Electronics Engineering domain have attended the conference. This conference presented an open forum for scientists, researchers and engineers to exchange the latest innovations and research advancements in the areas of next-generation Automated ships, Marine electrical and control systems, Marine Electronics and Navigation Systems and Robotics and Marine automation in the maritime industry.

A panel discussion was organized with eminent speakers from the maritime industry and Electrical and Electronics Engineering domain. They discussed the role of Electrical Engineers in Maritime sectors. They mentioned the importance of Electrical Engineers in shipping industries and other industries. They said that the Electro-Technical officers will occupy key positions in ships in future. The

Keynotes from distinguished experts from worldwide and technical paper presentation sessions have been organized in the International Conference. More than 200 papers from Academicians, Researchers was received. Out of this, 104 papers got shortlisted for proceedings. In the international Conference, 45 Papers was presented.

Topics on Smart Grid Technologies and its Applications, Renewable Power Generation System, Power System Restructuring and Deregulation, Energy Management and Auditing, Finite Element Analysis of Electrical Machines under the topics of Electrical Engineering and VLSI Design and Testing, Embedded System Design, Nano Technology Wireless Communication, Big Data & Analytics, Advanced Communication Systems, Cloud Computing and Advanced Computing Technologies are some topics covered.

SOME IMPORTANT MEMORIES

Some Highlights of 2019-2020

- Guest lecture on "Applications of Special Electrical Machines in Industrial Robotics"was held on 15.11.2019
- Guest Lecture on "Mitigation of Issues in Power Systems" on 14.11.2019
- Faculty Development Programme on "Smart Micro Grids and Energy Storage Using Homer and PV Systems" was conducted on 19.09.2019.
- Five days online National Level FDP on "Modeling, Technologies, and Control on Electric Vehicle (Powering the Future of Sustainable Mobility)" was conducted from25.05.2020 to 29.05.2020
- The Awareness on Energy Saving activity was organized by Awareness on Energy Saving agency under the scheme of Aids Awareness program

STUDENT'S CORNER

NEW GENERATION OF WEARABLE MEDICAL DEVICES CALLS FOR SECURE, HIGH-DENSITYNON-VOLATILE MEMORY

In the age of COVID-19, medical wearable security and data storage stand to change immensely. If COVID has taught us anything, it is the health risk when large numbers of potentially infected people congregate in a confined space.

For the foreseeable future, social distancing continues to be mandatory in indoor spaces for citizens in many countries.

Like schools and factories, hospitals too will be looking for ways to reduce the number of people gathered inside at any one time, to make it easier to maintain distance between people. Monitoring and diagnosis of health systems have to be given high priority. Consumers are already familiar with wearable activity trackers which monitor physiological signs such as heart rate. Now Win bond expects to see a rapid expansion in the use by medical practitioners of wearable devices for use in the treatment of a range of conditions.

The use of wearable and in-home patient monitoring equipment will relieve pressure on medical facilities and facilitate social distancing in surgeries and hospitals. But this personal equipment will generate a torrent of personal data. Multi- sensor monitoring equipment is already available to track various vital signs simultaneously, such as heart rate, heart-rate variability, blood oxygen levels, and temperature.

Wearable devices cannot be assumed to have continuous access to the internet, so the system architecture has to allow for local storage of these user data. This means that wearable medical devices need high-density, non-volatile memory. And because decisions about a patient's diagnosis and treatment might be based on the data, data integrity is a mission-critical requirement.

MANIVANNAN / III YR EEEM

DAMAGED SOULS

"A shop owner placed a sign above his door that said: 'Puppies For Sale.'

Signs like this always have a way of attracting young children, and to no surprise, a boy saw the sign and approached the owner; 'How much are you going to sell the puppies for?' he asked.

The store owner replied, 'Anywhere from $30 to $50.'

The little boy pulled out some change from his pocket. 'I have $2.37,' he said. 'Can I please look at them?'

The shop owner smiled and whistled. Out of the kennel came Lady, who ran down the aisle of his shop followed by five teeny, tiny balls of fur.

One puppy was lagging considerably behind. Immediately the little boy singled out the lagging, limping puppy and said, 'What's wrong with that little dog?'

The shop owner explained that the veterinarian had examined the little puppy and had discovered it didn't have a hip socket. It would always limp. It would always be lame.

The little boy became excited. ‘That is the puppy that I want to buy.’

The shop owner said, ‘No, you don’t want to buy that little dog. If you want him, I’ll just give him to you.’

The little boy got quite upset. He looked straight into the store owner’s eyes, pointing his finger, and said;

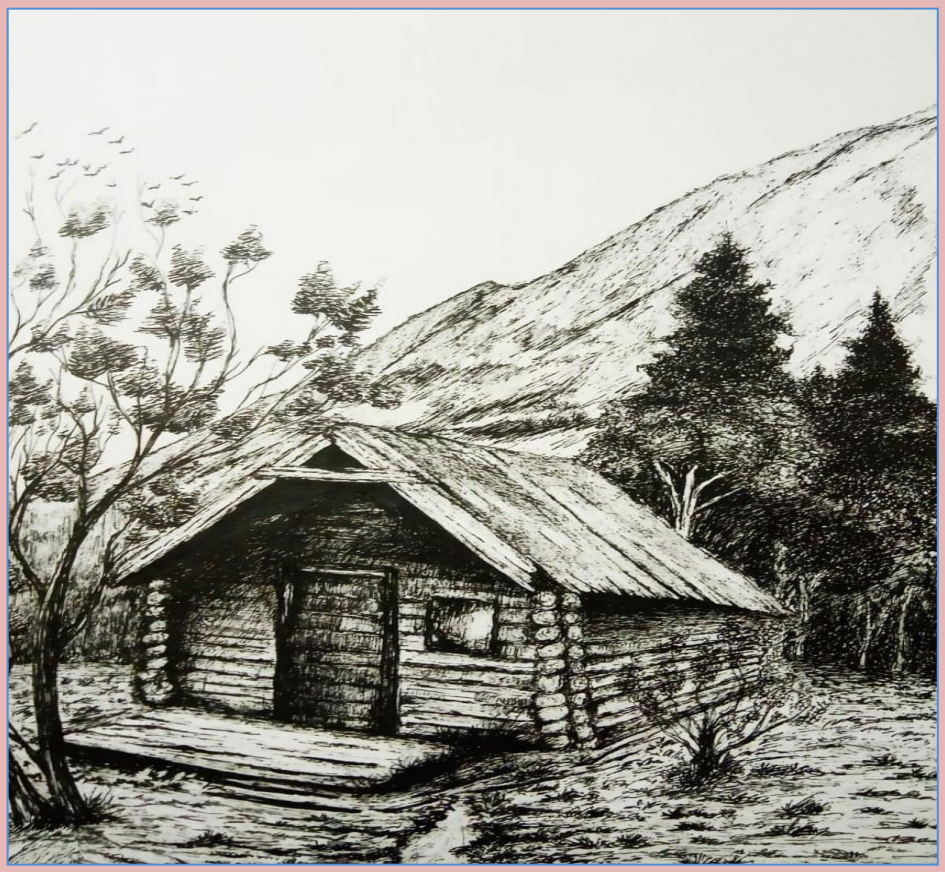
‘I don’t want you to give him to me. That little dog is worth every bit as much as all the other dogs and I’ll pay full price. I’ll give you $2.37 now, and 50 cents a month until I have him paid for.’

The shop owner countered, ‘You don’t want to buy this little dog. He is never going to be able to run and jump and play with you like the other puppies.’

To his surprise, the little boy reached down and rolled up his pant leg to reveal a badly twisted, crippled left leg supported by a big metal brace. He looked up at the shop owner and softly replied, ‘Well, I don’t run so well myself, and the little puppy will need someone who understands!’”

Karan/II YR EEEM

PENCIL MAGIC



GOD IS EVERYWHERE

There was a young yogi in a village who had four smart students. They were good at performing the duties diligently. The students were taught everything at the Gurukul.

One day the yogi decided to keep a test. He gave four bananas to each of the students and said that they have to eat a banana where no one sees them. One student went to a farm, one went in-between the mountains and one went in a closed room. Same evening all the students came back, and the yogi asked if they have completed their task. All had completed except one. The yogi asked why he was not able to eat the

banana. He replied that he couldn't found a place where no one can see him. He said that he went to all the possible places but he couldn't eat the fruit as he found GOD being omnipresent. The yogi was proud and impressed with the student and was happyto find the knowledgeable student among the four.

God is always there with us and will lead us to the right path.

S.SAI HARI/IIYR EEEM

AN ULTRA-LOW-VOLTAGE ENERGY HARVESTER AND POWERMANAGER IC AIMS TO EXTEND THE USEFUL LIFE OF PRIMARY BATTERIES IN WIRELESS NETWORK DEVICES

LTC3107 is a highly integrated DC/DC converter designed to extend the life of a primary battery in low power wireless system networks (WSNs). It combines energy harvesting and power management capability with a primary battery cell. The LTC3107 harvests energy from thermoelectric generators (TEGs) and thermopiles when these sources are available, storing excess power in a storage capacitor and transitioning to the primary cell to power a wireless sensor node when harvested power is unavailable. Its reserve energy output is clamped at 4.3V.

The LTC3107's internal boost converter, combined with a small step-up transformer, harvests energy from input voltages as low as 20mV, commonly found from sources such as TEGs and thermopiles, and delivers an output which tracks the battery voltage. An additional 2.2V LDO output provides power to an external microprocessor. If harvested energy is not available, the system is powered directly from the battery, requiring only 6 µA. The combination of a small,

standard step-up transformer, 3 x 3 mm package and minimal external components ensures a compact solution footprint.

The LTC3107 is designed to use the primary battery to start up the IC and to power VOUT and the LDO, with or without any available power from the energy harvesting source. When the energy harvesting source is available, the LT3107 seamlessly transitions to run only from the energy harvesting source with only 80 nA of quiescent current drawn from the primary battery. If the energy harvesting source shuts down or if the load exceeds the energy harvested, the LT3017 transitions to the primary battery to supply the VOUT and VLDO loads. The BATT_OFF indicator can be used to track battery usage.

P. DHANASEKAR/IIIYR EEEM

STICK-ON ELECTRONIC TATTOOS

John A. Rogers, a professor of materials science at the University of Illinois at Urbana- Champaign, has developed a prototype that can replicate the monitoring abilities of bulky electrocardiograms and other medical devices that are normally restricted to aclinical or laboratory setting.

To achieve flexible, stretchable electronics, Rogers employed a principle he had already used to achieve flexibility in substrates. He made the components—all composed of traditional, high-performance materials like silicon—not only incredibly thin but also“structured into a serpentine shape” that allows them to deform without

breaking.

In the past, says Rogers, he was able to create devices that were either flexible but not stretchable, or stretchable but not flexible. In particular, his previous work was limited by the fact that the electronics portions of his designs couldn't flex and stretch as much as the substrate they were mounted on.

The electronic tattoo achieves the mechanical properties of skin, which can stand up to twisting, poking, and pulling without breaking. Rogers's tattoo can also conform to the topography of the skin as well as stretch and shift with it. It can be worn for extended periods without producing the irritation that often results from adhesive tapes and rigid electronics. Although Rogers's preliminary tests involved a custom-made substrate, he also demonstrated that the electronics could be mounted onto a commercially available temporary tattoo.

The prototype was equipped with electrodes to measure electric signals produced by muscle and brain activity. This could be useful for noninvasive diagnosis of sleep apnea or monitoring of premature babies' heart activity. It also might be possible, Rogers says, to use the tattoos to stimulate the muscles of physical rehabilitation patients, although this use wasn't demonstrated in the paper.

To demonstrate the device's potential as a human-computer interface, Rogers mounted one of the tattoos on a person's throat and used measurements of the electrical activity in the throat muscles to control a computer game. The signal from the device contained enough information for software to distinguish among the spoken words "left," "right," "up," and "down" to control a cursor on the screen.

The device included sensors for temperature, strain, and electric signals from the

body. It also housed LEDs to provide visual feedback; photodetectors to measure light exposure; and tiny radio transmitters and receivers. The device is small enough that it requires only minuscule amounts of power, which it can harvest via tiny solar cells andvia a wireless coil that receives energy from a nearby transmitter. Rogers hopes to build in some sort of energy-storage ability, like a tiny battery, in the near future. The researchers are also working on making the device wireless.

Ultimately, Rogers says, "we want to have a much more intimate integration" with the body, beyond simply mounting something very closely to the skin. He hopes that hisdevices will eventually be able to use chemical information from the skin in addition toelectrical information.

PRADEEP KUMAR R/II YR EEEM

MONEY PAD-THE FUTURE WALLET

Money pad is a biometric system similar to a credit card or a smart card just like a floppy disk. It consists of a touch sensor and magnetic disk as its peripherals Money in the 21st century will surely prove to be as different from the money of the current century as our money is from that of the previous century. Just as fiat money replaced specie-backed paper currencies, electronically initiated debits and credits will become the dominant payment modes, creating the potential for private money to compete with government-issued currencies." Just as everything is getting under the shadow of "e" today we have paper currency being replaced by electronic money or e- cash.

Hardly a day goes by without some mention in the financial press of new

developments in "electronic money". In the emerging field of electronic commerce, novel buzzwords like smartcards, online banking, digital cash, and electronic checks are being used to discuss money. But how are these brand-new forms of payment secure? And most importantly, which of these emerging secure electronic money technologies will survive into the next century?

PRABHUL B/II YR EEEM

WHY SWAMI VIVEKANANDA IS OURINSPIRATION!

Swami Vivekananda should always be remembered for his inspiration to mankind. Swami, without a doubt, the greatest source of achievement, pride and inspiration. He taught us, unconditional love, reinforced the importance of giving back and taught us how to be a better person.

Here's what Romain Rolland thought about him: His (Swami Vivekananda) words are great music, phrases in the style of Beethoven, stirring rhythms like the march of Handel choruses. I cannot touch these sayings of his, scattered as they are through the pages of books, at thirty years' distance, without receiving a thrill through my body like an electric shock. And what shocks, what transports, must have been produced when in burning words they issued from the lips of the hero!

On his birth anniversary, which is just ahead, let us shed light on some of his inspirational quotes.

1. 3 GOLDEN RULES from Swami VivekanandaWho is helping you, don't forget them

Who is loving you, don't hate them

Who is believing you, don't cheat them

2. Anything that makes you weak physically, intellectually and spiritually, reject aspoison.

3. Talk to yourself at least once in a day. Otherwise, you may miss a meeting with anEXCELLENT person in this world…

4. Relationships are more important than life, but it is important for those relationshipsto have life in them…

5. Like me or hate me, both are in my favour, if you like me, I am in your heart, if you

6. By the study of different religions we find that in essence, they are one.

7. Where can we go to find God if we cannot see Him in our hearts and every living being.

8. Fill the brain with high thoughts, highest ideals, place them day and night before you and out of that will come great work.

9. We are what our thoughts have made us; so, take care of what you think. Words are secondary. Thoughts live; they travel far.

10. You cannot believe in God until you believe in yourself.

11. The world is the great gymnasium where we come to make ourselves strong.

12. All the powers in the universe are already ours. It is we who have put our hands before our eyes and cry that it is dark.

13. When an idea exclusively occupies the mind, it is transformed into an actual

physical or mental state.

14. Arise! Awake! and stop not until the goal is reached.

So, let us arise, let us grow from the inside out, with Swami Vivekananda's thoughts. As Swamiji has said, 'None can teach you, none can make you spiritual. There is no other teacher but your soul.'

ABHINAV.V/IV YR EEEM

POWER ELECTRONICS PIONEER'S INVENTIONSHAVE MADE RENEWABLE ENERGY MORE AFFORDABLE

IEEE Fellow Frede Blaabjerg received the Global Energy Prize for his contributions

IEEE Fellow Frede Blaabjerg, it's less expensive to generate electricity from renewable energy sources. His development of variable speed drive technologies has ledto more efficient heating, ventilation, and air conditioning (HVAC) systems.

For his work on energy storage and integration technologies, Blaabjerg received this year's prestigious **Global Energy Prize**. The award—given by the Global Energy Association, a nongovernmental organization in Moscow—honours outstanding research that addresses energy challenges. He shares the US $600,000 prize with Khalil Amine, leader of the advanced lithium battery technology team at Argonne National Laboratory, in Illinois.

Blaabjerg is a professor of power electronics and drives at Aalborg University, in

Denmark. He's also president of the IEEE Power Electronics Society and was editor in chief of IEEE Transactions on Power Electronics for six years.

"I have been in the power electronics field for 30 years," Blaabjerg told *The Institute*, "and my absolute major contribution in terms of impact has been in applications such as renewables, like wind generation. That includes connecting wind turbines to the grid and all the things that make it possible for going from wind to electricity."

REDUCING ENERGY COSTS

The converter technologies, new design tools, and control electronics developed by Blaabjerg improved the quality of energy being fed into the power grid from photovoltaics, wind turbines, and other renewable sources, making the electricity more reliable and less expensive.

"Many years ago, it was not really economically feasible to apply this technology in these kinds of applications," Blaabjerg says.

His work on energy conversion from wind turbines has saved tens of millions of US dollars annually for consumers, according to the Global Energy Prize website.

He also invented ways to make HVAC systems run more efficiently. The Global Energy Prize website reports that his invention of energy-optimal control systems for asynchronous induction motors and permanent magnet motors has increased efficiency by up to 20 per cent compared with standard methods. He also reduced the number of sensors in HVAC systems' industrial drives—which lowered the cost to run them.

Continuing to innovate, he's now working on ways to predict when new power and electronics equipment will fail by using mathematical models that describe the

wear out of the applied components in the power electronic circuits. He says he is trying to predict how long a product will last and at the same time take into account statistical variation.

He also is developing an automated way of conducting reliability assessments on the millions of renewable energy generators on the power grid.

JAYA SURYA G/ IIIYR EEEM

THE YOGIC SCIENCE

Derived from the Sanskrit word "yuji," meaning yoke or union, yoga is an ancient practice that brings together mind and body. It incorporates breathing exercises, meditation and poses designed to encourage relaxation and reduce stress

This article takes a look at 12 evidence-based benefits of yoga.

- ***Can Decrease Stress***

Yoga is known for its ability to ease stress and promote relaxation. Multiple studies have shown that it can decrease the secretion of cortisol, the primary stress hormone.

- *Relieves Anxiety*

Many people begin practising yoga as a way to cope with feelings of anxiety.

- *May Reduce Inflammation*

In addition to improving your mental health, some studies suggest that practising yoga may reduce inflammation as well. Inflammation is a normal immune response, but chronic inflammation can contribute to the development of pro-inflammatory diseases, such as heart disease, diabetes and cancer.

- *Could Improve Heart Health*

From pumping blood throughout the body to supplying tissues with important nutrients, the health of your heart is an essential component of overall health. Studies show that yoga may help improve heart health and reduce several risk factors for heartdisease.

- *May Fight Depression*

Some studies show that yoga may have an anti-depressant effect and could help decrease symptoms of depression. This may be because yoga can decrease levels of cortisol, a stress hormone that influences levels of serotonin, the neurotransmitter often associated with depression

- *Could Reduce Chronic Pain*

Chronic pain is a persistent problem that affects millions of people and has a range of possible causes, from injuries to arthritis. There is a growing body of research demonstrating that practising yoga could help reduce many types of chronic pain.

- *Could Promote Sleep Quality*

Poor sleep quality has been associated with obesity, high blood pressure and depression, among other disorders. Studies show that incorporating yoga into your routine couldhelp promote better sleep.

- *Improves Flexibility and Balance*

Many people add yoga to their fitness routine to improve flexibility and balance. There is considerable research that backs this benefit, demonstrating that it can optimize performance through the use of specific poses that target flexibility and balance.

- *Could Help Improve Breathing*

Pranayama, or yogic breathing, is a practice in yoga that focuses on controlling the breath through breathing exercises and techniques. Most types of yoga incorporate these breathing exercises, and several studies have found that practising yoga could help improve breathing.

- *May Relieve Migraines*

Migraines are severe recurring headaches that affect an estimated 1 out of 7 Americans each year. Traditionally, migraines are treated with medications to relieve and manage symptoms. However, increasing evidence shows that yoga could be a useful adjunct therapy to help reduce migraine frequency.

- *Promotes Healthy Eating Habits*

Mindful eating, also known as intuitive eating, is a concept that encourages being present in the moment while eating. It's about paying attention to the taste, smell andtexture of your food and noticing any thoughts, feelings or sensations you experiencewhile eating.

- *Can Increase Strength*

In addition to improving flexibility, yoga is a great addition to an exercise routine for its strength-building benefits. There are specific poses in yoga that are designed to increasestrength and build muscle.

HEMANTH RAJ/III YR EEEM

CODING IS IMPORTANT IN AI ERA

From morning tonight, we are surrounded by computers and it is difficult to imagine life without it. Online games and puzzles have replaced traditional board games and OTTs have changed our entertainment consuming habits.

Pandemic has changed a lot of existing jobs and creates a lot of new jobs that we have never thought will ever exist. The coming age is going to be completely dynamic and our current curriculum was not enough to prepare our students for the coming market.

The National Education Policy (NEP), has introduced Coding at a young age to enhance the exposure to technology and create a path to a new world of innovation andcreativity. Tech thinkers and educators believe that coding is a game-changer and a new generation will use analytical thinking to solve the problem. It will help in developing skills to deal with problems whether it is maths, science, or humanities, and will be ready for the future job.

By 2018, 2.4 million STEM jobs were unfilled and 71% of all new jobs in STEM are in computing that requires algorithmic thinking and programming skills, but only 8% of STEM graduates are in Computer Science. Students who learn Coding as a skill geta higher score in mathematics, abstract thinking, and confidence.

Coding is important because:

- **Enhances entrepreneurial skills:** Coding help in developing the idea, which leadsto the creative and analytical thinking process. It helps in preparing the kids to become future entrepreneurs.

- **Makes a sound foundation:** At an early age kid's minds can adapt to anything, and can learn anything, it is the best time to introduce coding to them, because of theirgrabbing and learning power. Introducing coding at an early age, they can focus and learn it same as they learn other foundational subjects and make future-ready.
- **Offers the ability to create and innovate:** It allows creating a mind full of ideas and uses their imagination to create any programming and software through imagination and creativity. It brings innovations to personal and professional life and the ability to give jobs.
- **Enhances problem-solving skills:** Detecting problems and issues and breaking these into different aspects for the best solution are one of the elements of coding. Children and students will find out how to systematically solve problems. In case of a problem, computer programmers have to test various codes before finding the solution. Not only does coding teach students how to approach a problem with logic but it also teaches them patience and persistence.
- **Promotes logical and analytical abilities:** Coding demands that students use strategy to decide which formulas they need to apply to get to the solution. That is, it motivates algorithmic thinking. Not only will their coding skills improve with time, but their math skills also will be enhanced. Consequently, students can show betterresults in other tests as well.

Those who are looking to take up coding as a career should concentrate on gaining knowledge in SQL databases and programming languages such

as Java, JavaScript, XML, Python, and C++, along with becoming well-informed about operating systems and platforms like Windows and .NET, iOS, and Linux.

BALAMURUGAN/III YR EEEM

SHANTI TIGGA: THE FIRST FEMALE JAWAN INTHE INDIAN ARMY

India's first female Jawan in the Indian army Shanti Tigga was an epitome badassery and prowess who outperformed her male counterparts and participated in the territorial army. A widow who lost her husband when she was just 35, Shanti Tigga joined Recruitment Training Camp and came first for her skills in the firing. She was also honoured by former President Pratibha Patil, for her extraordinary endeavours. Shanti hailed from the Jalpaiguri district in West Bengal. Tigga cleared all her tests to join the 969 Railway Engineer Regiment of Territorial Army in 2011. She defeated all her male counterparts during their physical tests. Reports say on her 1.5 km run, she outran all of her other male counterparts to complete it with 5 seconds to spare till they caught up. She completed the 50 m run in 12 seconds during her tests.

Her little-known story deserves to be told for she did not just break barriers, she stood up for herself and excelled in a field few women have managed to breakthrough. Age, gender, motherhood no bar, she earned the distinction of becoming India's first female Jawan is a 125-year-old Indian army. She was found dead on May 13, 2013, under suspicious circumstances.

Currently are more than 3,500 women in the military, but front-line combat roles Were off-limits to them until Indian Air Force (IAF) approved a plan in 2015 to induct them into the fighter stream.

It was in 1992 that the army, air force and navy began inducting women for short-service Commission (SSC). This was the first-time women were allowed to join the military outside the medical stream. In 2006, a policy change allowed women to serve for a maximum of 14 years as SSC officers.

In January 2019, Defence Minister Nirmala Sitharaman took the historic decision to induct women as Jawans in the Corps of Military Police in the Indian Army. In under three months, on Thursday, 25 April, the Army issued a formal advertisement, calling for women to join as Soldier General Duty. When the position opened, for 100 Jawan's more than a lakh woman applied for it.

KULKARNI MAHIMA RAJESH/II YR EEEM

HELPING THE HELPERS

The fact that India's cities run on the backs of workers is known, but what is often unacknowledged is that so do many private homes. Domestic work is one of the biggest employers in India's large informal economy, especially in urban areas. It is also one of the largest employers for women. Yet, not enough focus has been placed on working women in our discussions on COVID-19 and the lockdown — there are no special economic packages for domestic workers unlike, say, for construction workers. Soon, the rhythms of domestic life will be faster and more consistent, just like before.

And like always, an entire set of activities and hours of labour will escape the purview of lawyers, economists and politicians alike. To understand how COVID-19 and the lockdown have impacted domestic workers, we conducted a rapid, telephonic survey of 500 householdsin Jaipur, Rajasthan, in mid-May.

When the lockdown began, there were appeals to employers to not withhold salaries for domestic workers. Yet, in an informal workplace with no formal job contract, these appeals are unenforceable. In March, 51% of the respondents said they were not paid fully indicating some compliance by employers. However, 89% said they were not paid atall in April. Ground reports suggest that May was no different. This has had an immediateeffect on worker households. The income of domestic workers is 50% of the total household income. It is the more regular form of income supplemented by other members who are generally daily wagers. So, what happened to these households?

First, it is important to recognize that these households were vulnerable even before the COVID-19 outbreak. On the eve of March 25, the average holding of rice and wheat in each household was less than 8 kg. On an average household had operational savings worth barely 15 days with most households reporting only 10 days' worth of operational savings. In the best cases women reported operational savings worth 23 days, far less than the time they had to ride out without income due to the lockdown. In the survey, 44% of women domestic workers reported having had to borrow money to ride through the lockdown period.

To make matters worse, according to the participants of the survey, rents have not been forgone but deferred. Dues (rent, water, electricity) that need to be

immediately attended to following the lifting of the lockdown are far more pervasive and higher in value than borrowings. The average due across 500 households was about ₹8,700. Close to one-third of the households had dues worth ₹10,000. Only about 12% reported not having any dues at all. Non-negotiable expenses such as milk, vegetables, fuel, oil and masalas cost them ₹100 per day. These have been largely managed from savings, borrowings and incurring debts as also with forgoing meals at large. In short, loss of income has meant that households have lost the thin layer of savings they had, and have left the lockdown with debt.

Second, the related dimensions of job status and income are not very encouraging either, with 25% of the workers saying they were asked not to return to work. Another 25% were unsure if they would be called back. Job-status and dues when seen together present a red flag. The average debt (excluding dues) in households where domestic workers were recently ousted from their jobs was about ₹6,800. It was ₹2,400 for those who still had their jobs. Hence, what we stare at is not just a plunge in economic condition but the withdrawal of the very means that can be a way to repair it.

These workers, despite the hardships, haven't left the cities and don't intend to do so. The city and the state will soon rely on them to restore normalcy. But can that be achieved if they continue to the battle precarity of income, job, nutrition and housing on an everyday basis?

With the lockdown being lifted, many workers will be quietly let off, while others will slowly return to work — poorer, saddled with debts, their little savings

wiped out. Recovery without compensating for wage loss and erosion of savings in the form of cash transfers is impossible. A health insurance against COVID-19 for every domestic worker is the only way the government can formally recognize the risks involved in their job and the problem that an infection can cause to their lives. But for all this to happen, they will first have to be recognized and workers have to be enrolled in government registers. It is both a need and an opportunity to extend and strengthen the frayed and mostly absent social protection nets to those who run our cities and our homes.

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