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A Technical Magazine cum Newsletter

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Kumaraguru College of Technology*

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GREEN FUTURE

Dr.S.A.Pasupathy, Chief Editor

In the last few years, invariably all the regions of this globe experiencing extreme weather conditions in the form of continuous drought or flooding or very hot summer or extreme cold. Despite many technological advancements, these are all the incidents reminds us that we are nowhere near to the mother nature. To reduce the damage on environment and leave the planet to our younger generations in the usable form, it is necessary for us to focus more on green technology which includes but not limited to buildings, automobiles and farming. This issue aims to disseminate some of the recent advancements in green technology. I thank Dr.P.Manimaran of VIT, Vellore and Mr. Arjun Raj of Robert Bosch Engineering and Business solutions, Coimbatore for contributing to this issue. We are happy to bring this issue in a very new and reader friendly attractive format and I trust that this will provide you good reading experience. As a team, we look forward to your contributions in the form of feedback, comments and guest authors.

Special issue
on

**Green
Future**

TRENDS IN ELECTRIC VEHICLES

*Dr. P. Manimaran,
School of Electronics Engineering (SENSE),
VIT-Vellore.*

The current trend in automobile industry is moving towards the growth of electric vehicles. The enhancement of technology behind the electric vehicles can promote the conventional automobile industry into smart automobiles. There are two major categories of electric vehicles: Hybrid electric vehicles and Battery electric vehicles. Hybrid electric vehicles have the benefits of conventional fuel engines and electric motors. They can run using fuel alone and can use an electrical outlet to recharge the battery.

Electric Vehicles (EVs)

Electric vehicles, also called as battery electric vehicles, on the other hand, are equipped with electric motors which are powered by rechargeable batteries. Though no fuel source is used in these vehicles, the batteries are recharged using either a wall socket or a dedicated charging unit. The major advantage of the electric vehicles is that the maintenance of vehicles is easy as they have fewer moving parts than a conventional fuel car. Another advantage of these vehicles is that they are adaptable to solar charging system which will promote green power.



"The technology behind the electric vehicles can promote the conventional automobile industry into smart automobiles"



(Source: www.hyundai.com)



(Source: Revolt Intellicorp)

Challenges

The electric vehicle market in India is facing many challenges. The cost of these vehicles is the big challenge because the Lithium ion batteries covers upto 60-70 percent of the cost of the vehicle. More number of charging stations have to be installed since the charging time is about 6 to 8 hours per vehicle. Frequent charging stations are needed to handle the situation and save the time. Establishing spacious charging station infrastructure is another challenge.

Current Trends

Hyundai has launched Kona Electric, India's first proper electric SUV and received multiple positive responses. Following this launch, many automakers will launch electric vehicles such as Nissan Leaf EV in coming days and few upcoming electric vehicles in India include the Maruti Suzuki Wagon R, MG eZS and more. Renault has initiated its debut in the electric vehicles segment with its Kwid EV and is targeting the Indian market in 2022. This electric vehicle is equipped with a 26.8 kWh battery which will power a permanent magnet synchronous motor. The battery supports fast charging which can charge it from 30% to 80% in 30 minutes. However, a standard charger takes around 4 hours for a full charge. Meanwhile, Hyundai Motor India will begin its electric vehicle supply India's Ola from 2022-23. These vehicles will give attention on low manufacturing cost for Indian market.

Electric Bike

India has the second-largest motorcycle market in the world with sales dominated by basic customers. More than 20 million two-wheelers were sold to domestic customers in 2017-18. With conventional usage of fuel, these vehicles will potentially make the polluted environment and hence, there is a wide scope of manufacturing electric bikes to make the automobile segment cleaner and more sustainable. On the other hand, Artificial Intelligence based electric bike, also called as, India's first AI-enabled e-bike, AI-Revolt RV400 (Certified by ARAI (Automotive Research Association of India)), is ready to hit the market during August 2019.

Opportunities in EV

Although the EV technology has limitations on battery, charging, weight, speed, it has also opened wonderful avenues for research and business opportunities. For instance, an established Jayem automotive from Coimbatore is selling retrofitting systems for small and medium sized vehicles whereas the E-trio, a startup from Hyderabad is also selling retrofitting kit for cars and Light commercial vehicles. This is not only helped to venture into entrepreneurship and also provide wonderful employment opportunities.

On the research side, battery management systems (BMS) and charging are having immense potential as it requires good expertise in power electronics and drive systems. The parasitic energy consumption for air conditioning system of EV not only opens up the opportunity for energy management but also provides immense opportunity related to assess the thermal comfort of the occupants.

HYDROPONICS

Hydroponics is derived from hydro culture. It is a method for growing and nurturing plants in a soilless environment by mixing nutrient solutions in the water. Plants can be grown only by exposing their roots in the mineral solution. In few cases, the roots would be aided by inert soil like mediums such as gravel or perlite. The accumulation of nutrient solution is prepared from fish excreta, animal manure, bird manure or generic nutrients in hydroponics system. The hydroponic growth bed systems are built with materials like glass, stone, metal, wood, vegetable solids and concrete.



Mr.S.Boopathy,
Assistant Professor,
Department of ECE,
Kumaraguru College of
Technology

The basic necessity of plant is to nurture itself with sufficient nutrients for its growth. There are many chemical combinations that are mandatory for a plant's growth. A plant's production is supported by sixteen basic elements such as oxygen, hydrogen, nitrogen, carbon, potassium, sulphur, phosphorus, and so on. There is a further split with above mentioned elements: C, O, H, macronutrients such as N, P, K, S, Mg, Ca and micro-nutrients like Cu, Ni, Fe, Zn, Mn, B, Cl, Mo. In hydroponic plants, absorption rate is directly proportional to the amount of nutrient concentrate near the roots in the solution.

Currently, commercial hydroponics is emerging as a successful one in India. Goa's Letceta Agritech is one of the first ever indoor hydroponics system. It produces an average of about 1.5 to 2 tons of fresh leafy veggies of high quality with zero pest footprint. On the flip side, hydroponic farming demands very high capital investment, higher running cost, extensive monitoring and expertise in this farming technology. However, this method is most suited for urban farming where the plants cannot be grown in the land. Moreover, this system is fully mechanised and automated, it requires continuous supply of power. provided with this condition and the future farming trend, it will also create wonderful opportunity not only for entrepreneurship and employments such as developing machines, selling machines and educating the Z-gen farmers. As it is complex, the researchers across the globe are trying to provide IoT based solution to reduce the manual work.

In India, research Institutions including Centre for Development of Advanced Computers (C-DAC) and IITs also pursue research in this direction. On the enterprising side, Future farms – Hydroponics, a Chennai based startup in Tamil Nadu provides IoT based solutions for rooftop cultivation with complete user flexibility. Similarly, a North Indian based start up Junga - Fresh & Green is holding 9.3 hectare of commercial production in Shimla.

TECHNOLOGY FOR GREEN BUILDING



Mr. Arjun Raj
Alumnus, (2003- 2007 Batch),
Architect,
Robert Bosch Engineering and
Business solutions, Coimbatore

"The objectives of a green building are met by efficient resource utilization, protection of occupant health and by reducing waste and environmental degradation"

INTRODUCTION

A green building has a reduced impact on the environment and human health when compared to a conventional building. The term "Green" is applied to both the structure itself and also to the processes that are applied to the life cycle of the structure. One life cycle assessment method is provided by the Leadership in Energy and Environment (LEED) framework. It is one of the most popular rating systems developed by the nonprofit U.S Green Building Council (USGBC). The CII-Sohrabji Godrej Green Business Centre in Hyderabad, India received the highest LEED platinum rating. It was the greenest building in the world when it was completed in 2003. Some interesting technologies employed to achieve the goals were simulations, solar photovoltaic systems, air quality monitoring, high performance glass, aesthetic roof gardens, rain water harvesting and so on.

The objectives of a green building are met by efficient resource utilization, protection of occupant health and by reducing waste and environmental degradation. This article shall discuss some of the technologies which are instrumental in achieving these goals.

EFFICIENT RESOURCE UTILIZATION

Resources consumed heavily by buildings are land, water, energy and materials to name a few. If new technologies to reduce the consumption of these resources are not adapted, it might contribute drastically to worldwide negative phenomena like global warming. Figure 1 shows a thermogram that compares the heat radiation from a low energy house and a normal home.

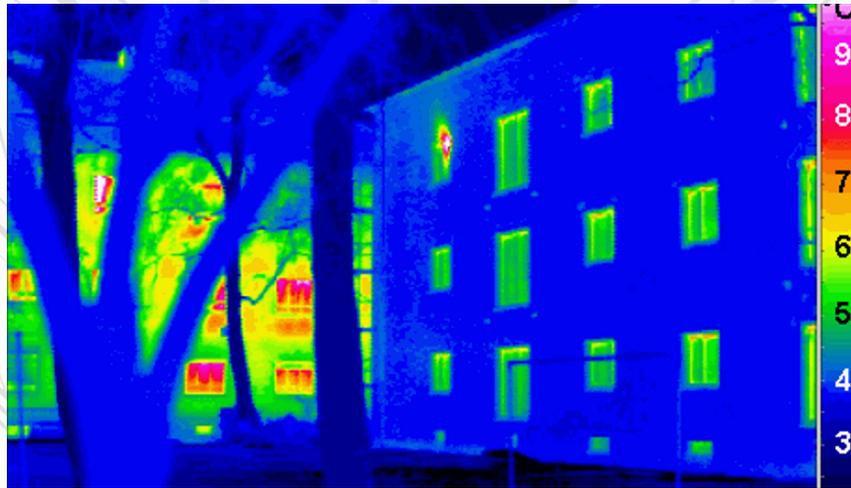


Figure 1: Thermogram comparing heat radiation of a passive house (right) to a conventional house (left).

Low energy houses use a combination of techniques like passive solar design in which windows, walls and doors are made to store heat during winter and reject excess of the same during summer.

Other strategies to reduce energy consumption include solar water heating and onsite generation of renewable energy. Rainwater harvesting, low flush toilets, intelligent garden hose nozzles are some technologies available for improving water efficiency. Using recycled materials like lumber and copper is a good idea to be efficient on the materials front.

OCCUPANT HEALTH PROTECTION AND CONCLUSION

Sick Building Syndrome (SBS) refers to a condition in which the occupants feel sick in a building for no apparent reason. This is mainly due to poor heating and ventilation design, use of hazardous organic volatile compounds and so on. Green building technologies address these issues to mitigate the impact on human health. Though green building as an idea is very relevant to today's prevailing social problems, one has to perform a detailed cost benefit analysis at every stage from planning to occupancy. Further reading on the current research trends in this field can be found in the article "Green Building research current status and future agenda: A review" by Zuo and Zhao in *Renewable and Sustainable Energy Reviews*, Elsevier, 2014.

REFERENCES

- Building the Green Way, Charles Lockwood, *Harvard Business Review*, June 2006.
- CII Sohrabji Godrej Green Business Center, Asia Business Council.

Green Energy

Mr. N. Arun,
Second Year, Department of ECE,
Kumaraguru College of Technology



Innovations, improvements and industrialization are ruling the whole world. Almost 80% of the energy what we get is from fossil fuels. How long will these resources be available? Will we leave something for the future? or is there any source that is replaceable? The solutions to all these problems can be dealt with the renewable energy sources that are naturally available.

"Renewable energy sources reduce pollution and thereby reduce threats to human health"

The renewable energy sources like solar, wind, geothermal, hydro, bio-mass can be used instead of non-renewable sources. If these sources are used for majority of applications, about 80% of coal and 50% of water can be saved. Moreover, these renewable energy sources reduce pollution and thereby reduce threats to human health. Solar, wind, hydro energy sources do not produce any air pollution. Geo-thermal and bio-mass sources produce pollution less than the non-renewable energy sources.

Many countries around the world have constructed green-flat houses so as to reduce the usability of non-renewable sources. A power plant is being installed in Denmark at middle of the city. The gas that is released from the chimney of this power plant has no toxic gas components. The waste toxic gases are not released in the atmosphere. These gases are used to produce energy using an effective mechanism that does not harm our environment.

It is the responsibility of each individual to save our mother Earth. If we use the renewable energy sources in a proper manner, the future will be a heaven to live in.

REFERENCES

- <https://www.renewableenergyworld.com/index/tech.html>
- <https://www.sustainabilitydegrees.com/what-is-sustainability>
- <https://www.eia.gov/energyexplained/renewable-sources>



Faculty of the issue

DR.S.N.SHIVAPPRIYA

Dr.S.N.Shivappriya completed her undergraduate and postgraduate degrees in the years 2004 and 2006 respectively. She completed her Ph.D. Degree in Bio-Medical Signal Processing in the year 2015.

She started her career as Lecturer in the year 2006 at Bannari Amman Institute of Technology. She joined at Kumaraguru College of Technology in the year 2009. In her period of service, she holds various responsibilities like as Class advisor, BOS coordinator, Faculty recruitment, Theory and Practical Exam coordinator, Time table coordinator, Lab in-charge, Academic, ISO and Anna university audit in-charge etc.,

She has organized CSIR sponsored FDP on Introduction to Machine Learning Theory and Application, Industry sponsored National Level Technical Symposium, NSQF -NSDC certified Training Programme for three Courses, STAR Outreach Programme and IEEE Junior Einstein Project competition twice for school students.

She published 14 papers in the Scopus indexed and referred International and National Journals, three book chapters in the area of machine learning, health analytics and image processing and 32 International and National Conference research papers and received two best paper awards. She received Faculty Recognition award twice for the publications in SCI indexed journals. She is an active member in ISTE, IEEE, IFERP. Her area of interest includes Artificial Intelligence, Machine Learning and Signal and Image Processing.

Announcement

The next issue will be loading with
a series on

"Myth of Engineering Accreditation"

STUDENT OF THE ISSUE

Mr.Gokulnath

DEPARTMENT OF ECE, KUMARAGURU COLLEGE OF TECHNOLOGY



Hailing from a Tamil medium school, Mr.Gokulnath is a bio-math student who completed his schooling with good marks. Stepping into his freshman year, he lacked in understanding English and communicating was a big struggle but he tries to overcome by reading story books.

Although he never lacked in academics as he scored proficiently through the semesters. Rather than studying his syllabus he was also part of the chess team of KCT in his first year. But he aspires to do an invention that will benefit people. It was in his second year, he realized that he should do something in order to realize his dreams. He started to self-learn C programming language.

Despite starting absolutely from scratch, his determination to learn something new, paid him off. Once mastering his new skill, he realized his new-found love for programming. His next venture into the programming world was Python. His journey has led him to go through web development where he learnt HTML, CSS, Java Script, JQuery, PHP, MySQL hoping to become a full stack web developer. C++, C# and Linux OS were also the paths that he came across. It is the time when he decided to multiply his dimensions, he stepped into animation, modelling and game development by learning 3D modelling and VFX.

Questioning himself where would all these help him, he thought of applying all his previously learnt skills at the start of his 3rd year at college. Currently, he is working on deep learning and has planned to do a project using machine learning. His curious tale from an absolute zero to rocketing glory is a story in itself which will definitely be an inspiration for many who have had similar beginnings.



A few words from the protagonist of this article himself...

“Don’t be shy about knowing nothing
Be shy about you don’t try anything”
“Start by today; Make a perfect tomorrow”

ALUMNUS OF THE ISSUE



**Mr. Tamilvanan
Alumnus
(1993-1997 Batch)**

Tamilvanan Kovilur Govindan is a goal-oriented professional having nearly 20 years of cross-functional experience in Software Application Design, Development, Project Management, Delivery Management, New Business Setup / Process Management & Technical Support for applications within Client/Server and Web environments.

Tamilvanan started his career in IBM, Bangalore as Software Engineer and worked as Analyst in EDS, Chennai and executed many projects in insurance and logistics domains. He worked nearly 15 years in Singapore National Projects and implemented welfare schemes such as GST Voucher, Grow and Share Packages, GST Credits, NSRA and SG Bonus.

Tamilvanan Kovilur Govindan also worked as a Technical Leader in Central Provident Fund, Singapore Government. He has implemented many IT applications across various domains in Singapore government organisations. Around 2.5 million citizens of Singapore benefited from his project implementations.

Tamilvanan has received Ministry of Manpower Award multiple times for his project implementations. He also received Best Project Implementation Award for Pioneer Generation and Medisave Top-Up. He delivered multiple products across Application Lifecycle Management (ALM) portfolio as a part of Digital Transformation strategic initiative.

He has improved product quality delivery through analysis and tracking of IM8/ICT based program KPIs and team metric.

DEPARTMENT EVENTS

ONE CREDIT COURSE

An one credit course on “Urban Mining and Electronic Resource from E-Waste” was conducted on 13.04.2019 and 14.04.2019 for the third year Electronics and Communication Engineering students. The course was coordinated by the faculty members Dr.M.Bharathi, Dr.S.Sasikala and Mr.R.Karthikeyan. The resource person was Mr.PrasanthOmanakkuttan, Managing partner of Green Era Recyclers, Coimbatore. He is working on environmental conservation and waste management projects.



He explained about the types and composition of E-waste, challenges, pathway of pollutants from E-waste, informal and formal processing of E-waste, E-waste management rules and vulnerability of E-waste.



MOTIVATIONAL TALK

A motivational talk on "Professional Skill Development, Career Enhancement, Entrepreneurship and Ethical Workplace Practices" was conducted on 30.04.2019 and coordinated by Dr.Ramalatha Marimuthu, Ms.R.DhivyaPraba, Ms.A.KalaiSelvi and Mr.R.Karthikeyan of the department.

The Guest speakers of the session were Mr.Dhivyanshu Verma and Mr.Ramakrishna Rama from Dell R & D, Bangalore. The sessions were mainly based on the future scopes of the Engineering and they insisted how Engineering graduates should adapt to the needs of the industry and society. Further, they also promoted the ideas of several projects with leading industries and students from IITs in order to develop the particular skill. And they asked students to provide a project solution to the problems that they face in their daily college life. Students eagerly participated and provided sustainable and feasible solutions to the problems.

Participation of the Faculty Members

- Dr.S.Umamaheswari, Dr.S.Sasikala and Dr.K.Alagumeenaakshi participated in TEQIP-III sponsored FDP on “Applied Soft Computing: Theory and Practice” organized by PSG College of Technology, Coimbatore from 22.04.2019 to 28.04.2019.
- Mr.D.Allin Joe participated in Summer Research Fellowship Programme organized by Indian Institute of Science, Bangalore during May-July 2019.
- Mr.R.Navaneethakrishnan participated in Summer Faculty Research Fellow Programme organized by IIT-Delhi from 13.05.2019 to 13.07.2019.
- Mr.David, Mr.TimothyDhayakar Paul and Mr.V.P.Ajay participated in Hands on training program on “Technical Writing and Publishing with Advanced Computer Tools” at IIIT-Kancheepuram from 25.05.2019 to 29.05.2019.
- Dr.M.Bharathi, Dr.M.Shanthi, Ms.R.Hemalatha, Mr.R.Darwin and Mr.S.Arun Kumar participated in TEQIP-III sponsored FDP on “Automotive Embedded Systems” at PSG College of Technology, Coimbatore from 10.06.2019 to 16.06.2019.

Congratulations



Congratulations to Mr.R.Karthi Kumar,
(Assistant Professor) for getting married
with Ms.R.Soundarya on 20.06.2019



Congratulations to Mr.V.GuruPrasath,
s/o, Ms.N.K.Usharani (Sr. Technical Associate)
for getting married with Ms.M.Karthiga on
10.03.2019



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Department Vision

To be a centre of repute for learning and research with internationally accredited curriculum, state-of-the-art infrastructure and laboratories to enable the students to succeed in globally competitive environments in academics and industry.

Department Mission

- Motivate students to develop professional ethics, self-confidence and leadership quality.
- Facilitate the students to acquire knowledge and skills innovatively to meet evolving global challenges and societal needs.
- Achieve excellence in academics, core engineering and research.



குமரகுரு
தொழில்நுட்பக் கல்லூரி

சிவ்ஸி

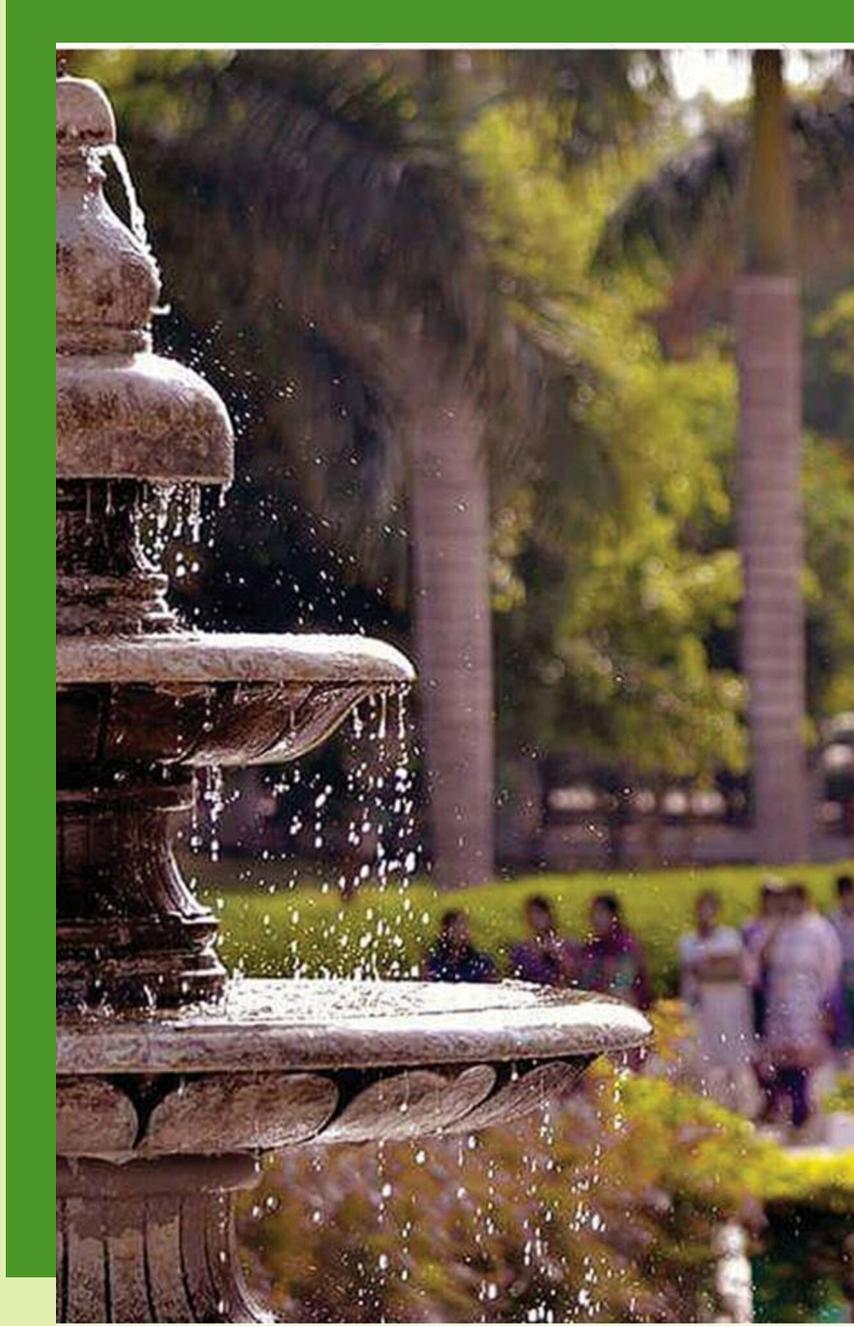
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