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DEPARTMENT OF **ELECTRONICS AND COMMUNICATION ENGINEERING (ECE)**

EXPLORE, DREAM, DISCOVER

MONTHLY **NEWS**LETTER

GENESIS

IGNITING THOUGHTS

SEPTEMBER 2021 ISSUE 44

VISION

To be recognized at the national and international level for excellence in Education and Research in Electronics and Communication Engineering.

MISSION

- Inculcating leadership qualities, adaptability, and ethical values.
- Imparting quality education in the field of electronics, communication, and related areas to meet the challenges in the industry, academia, and research.
- Nurture the growth of each individual by providing a dynamic and conducive learning environment.

DEPARTMENT ACTIVITIES/ACHIEVEMENT

CERD-RESEARCH SEED MONEY FUNDING

We are happy to announce two projects from Department of Electronics and Communication got selected for Research Seed Money Funding under the scheme CERD-APJKTU

- Project titled "IoT Based Smart Environmental Monitoring and Controlling System" proposed by Dr. Ajay Kumar, Associate Professor Department of Electronics and Communication sanctioned an amount of Rs. 50, 000.
- Project titled "Development of a Contactless Fog Computing based System for COVID'19 Detection and Cardiac Health Monitoring Using Deep Learning" proposed by Dr. Bipin P R, Associate Professor Department of Electronics and Communication sanctioned an amount of Rs. 55, 000.

Dr. Ajay Kumar,

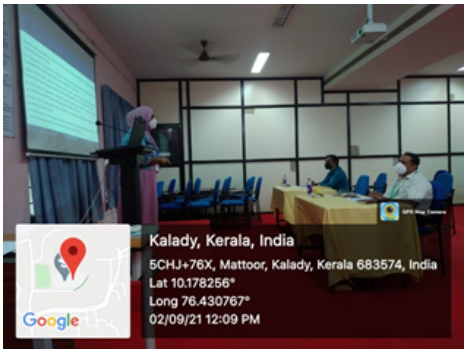
Dr. Bipin P R

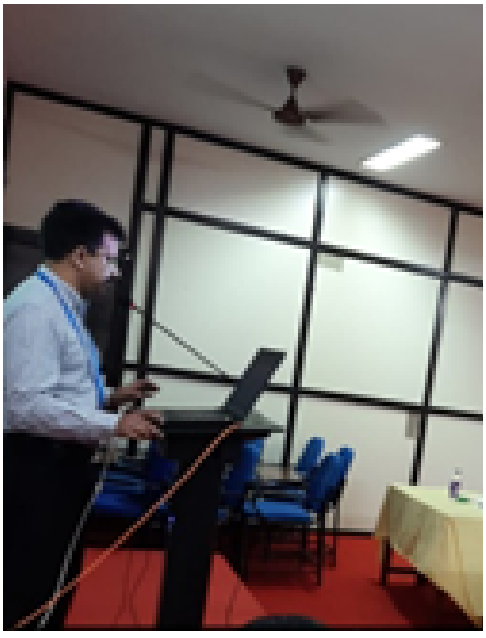
ACCESS' 21(ADVANCES IN COMPUTING, COMMUNICATION, EMBEDDED AND SECURE SYSTEMS)

ACCESS' 21 (AICTE Sponsored 2nd international conference on Advances in Computing, Communication, Embedded and Secure Systems), technically sponsored by IEEE, commenced on 2ND September 2021. This is the second edition of ACCESS.

The conference kick started by an inaugural session on 2nd September. The Welcome speech was delivered by Head of the Department, Dr. Bobby Mathews. The programme was inaugurated by Dr. Suresh Nair, Chair, IEEE India Council. It was followed by the felicitation by Prof. Jaishanker C P, Chief Operations Officer, Adi Shankara Group of Institutions. Dr. Ajay Kumar briefed about the conference and Dr. Suresh Nair delivered the inaugural address. He gave an insight into the relevance of putting dedicated effort for converting publications into patents and products. The Presidential address was delivered by our Principal Dr. Suresh Kumar V. He congratulated the department of ECE for getting grant for organizing conference from AICTE. He also appreciated the effort shown by the faculty of ECE towards hosting the conference in offline mode during this pandemic situation. The Proceedings was jointly released by our Principal Dr. Suresh Kumar V and Dr. Suresh Nair, IEEE India Council Chair. As a token of our deep gratitude, a momento was presented to our chief guest Dr. Suresh Nair by our Principal. The convenor of ACCESS' 21, Ms. Arya Paul, Assistant professor, ECE, delivered the vote of thanks.

The paper presentations were scheduled during the 3 days in 3 different venues. The Chairs of the conference evaluated each presentation. Each presentation was of duration 15 minutes followed by 5 minutes of questions and discussions. The paper presentations were organized under 5 tracks: Communication & Networking, Computational Intelligence, Computer vision and Signal processing, Robotics and Biomedical Engineering, and Security & Computing Technologies. We have received a total of 221 papers, out of which 67 papers were selected. 3 international papers were there from Iran, USA and UAE. We received 34 papers from other states with a 30% acceptance ratio. All the accepted and presented papers will be published in IEEE Xplore.



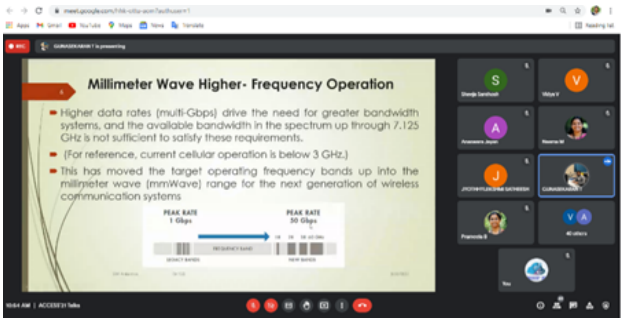


Apart from paper presentations, we had 9 renowned speakers for preconference as well as for tutorial sessions. The Conference was enriched with informative sessions by eminent personalities from academia and industry. The preconference talk kick started by Dr. Lalit Garg from University of Malta. He delivered a session on Health 5.0-Innovative, Intelligent, Biomedical Methods on August 18, 2021 at 2.00 pm. Next talk was on SIW Antennas for 5G applications by Dr. Gunasekaran Thangavel from University of Technology and Applied Sciences, Muscat on 20/08/2021 at 10.30 am. On 31st August, two preconference talks were conducted. One by Dr. Arindam Pal from CSIRO on AI for Legal Data Analytics: From Text to Citation Networks and Beyond and another by Dr. Mohamed Benbouzid from University of Brest, France on "From Signal processing to Machine learning for Electromechanical systems Failure detection and Diagnosis".

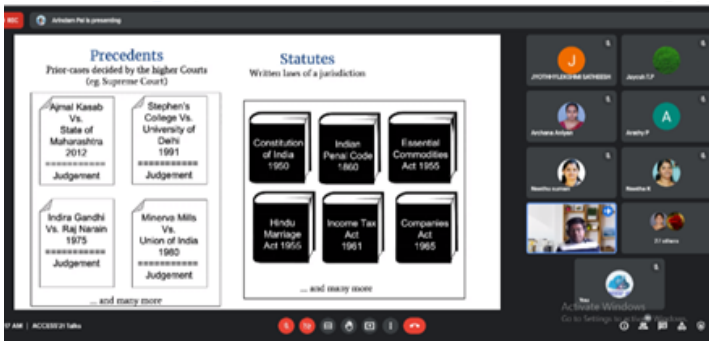
The keynote address was delivered by Dr. Uttam Ghosh, Vanderbilt university, USA and Mr. Bejoy Pankajakshan from Mavenir, Texas, USA on 2nd September. It was followed by session on Computational Intelligence, Methods and Applications by Dr. Valentina E Balas from University of Arad, Romania. On 3rd Sept., Dr. Hena Ray from CDAC Kolkata delivered session on Autonomous wheeled robotic platform in agriculture. Dr. XINGWANG LI from Henan Polytechnic University, China delivered session on 'The application of Ambient backscatter to physical layer security' on 4th September.

ACCESS 21 PRECONFERENCE TALK DETAILS

Date: 18/8/2021
Presenter: Dr. Lalit Garg, Senior Lecturer, Computer Information Systems, University of Malta
Topic: Health 5.0 and Innovative, Intelligent, Biomedical Methods

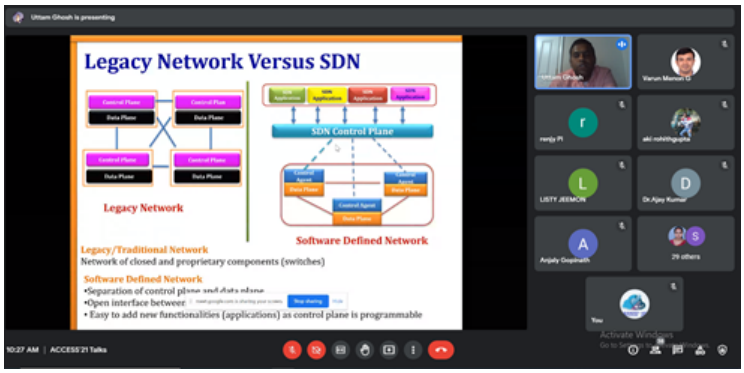


Date: 20/8/2021
Presenter: Dr. Gunasekaran Thangavel, Program director- Electronics and Communication engineering, University of Technology and Applied Sciences- HCT, Muscat
Topic: SIW antennas for 5G applications



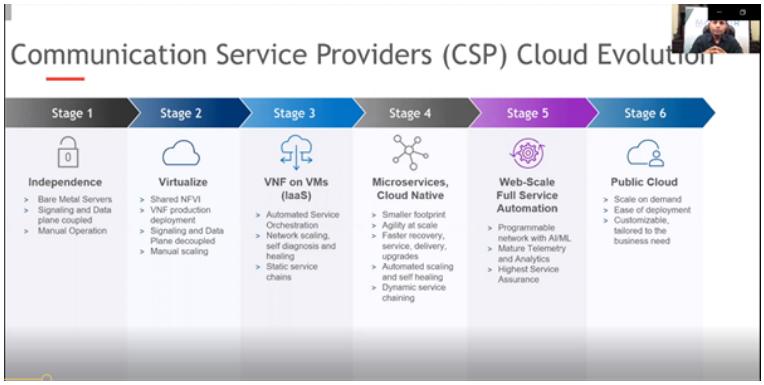
Date: 31/8/2021
Presenter: Dr, Arindham Pal, Senior Research scientist, Data 61, Commonwealth Scientific and Industrial Research Organisation(CSIRO), Australia.
Topic: AI for Legal Data Analytics: From Text to Citation Networks and Beyond

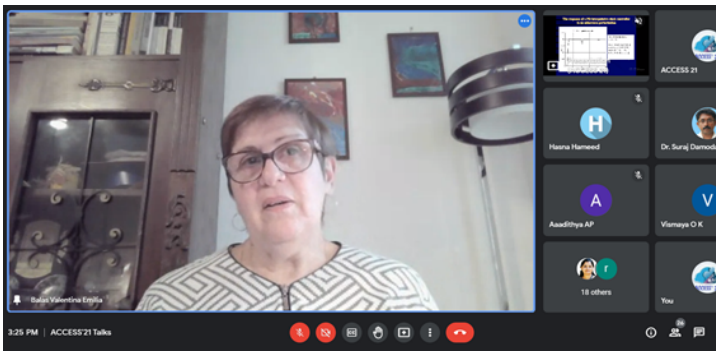
Date: 31/8/2021
Presenter: Dr. Mohamed Benbouzid, Professor of Electrical Engineering, University of Brest, France
Topic: From Signal processing to Machine Learning for Electromechanical systems failure detection and diagnosis



Date: 2/9/2021
Presenter 1: Dr. Uttam Ghosh , Assistant Professor of the Practice of Electrical Engineering and Computer Science, Vanderbilt University, Tennessee, US
Topic: Secure softwarized CPS and IoT: A Deep Dive

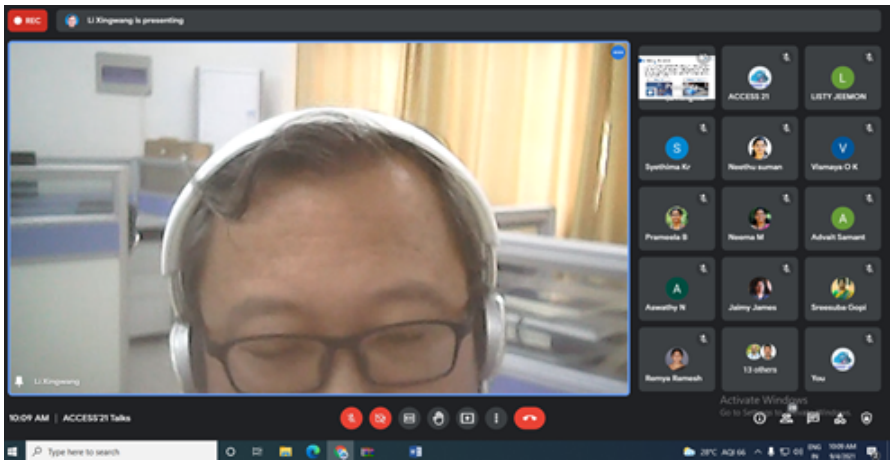
Presenter 2: Mr. Bejoy Pankajakshan , Chief Technology and Strategy Officer (CTSO), Mavenir, Texas, US
Topic: Evolving role of communication Service Providers(CSP's) and 5G Impact





Date: 02/09/2021
Presenter: Dr. Valentina E Balas from University of Arad, Romania
Topic: Computational Intelligence, Methods and Applications

Date: 03/09/2021
Presenter: Dr. Hena Ray, Joint Director, CDAC Kolkata
Topic: Autonomous wheeled robotic platform in agriculture.

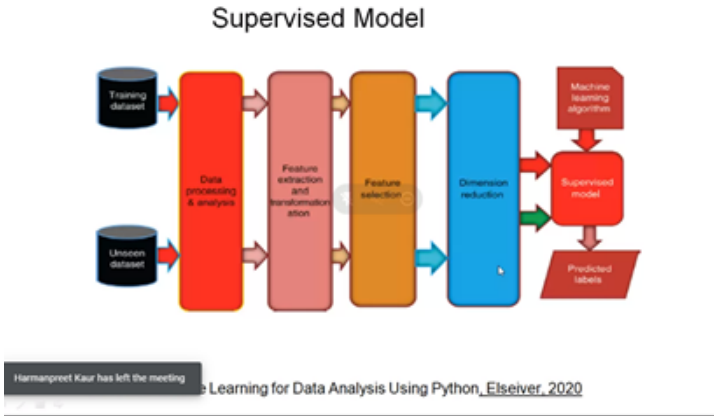


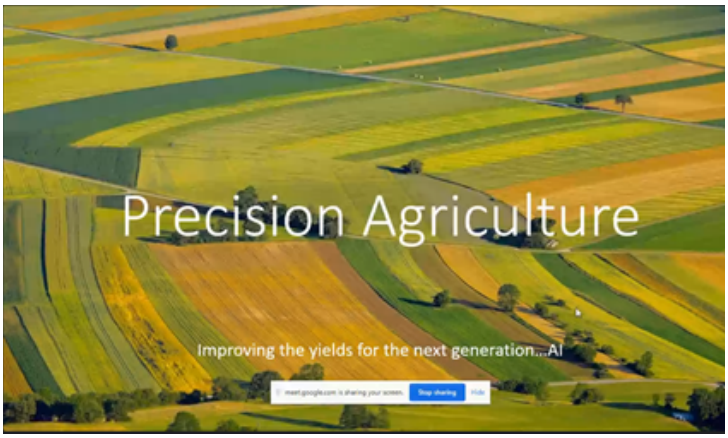
Date: 04/09/2021
Presenter: Dr. Xingwang Li, Henan Polytechnic University, China
Topic: The application of Ambient backscatter to physical layer security

AICTE – ATAL SPONSORED 5- DAY FDP ON AI ENABLED IOT NETWORKS(FROM 13/9/2021 TO 17/9/2021)

The FDP on AI Enabled IoT Networks covered the topics such as Intelligent IoT, Challenges and opportunities in AI, Machine learning concepts, deep learning based distributed compression, machine learning in cognitive IoT framework during the 5 days. The sessions included both practical and theory concepts. Apart from faculty members, research scholars, PG scholars and employees from industries participated in the programme. A total of 145 participants registered for the FDP. Eminent speakers from IITs, NITs, reputed industries were invited to serve as the resource persons.

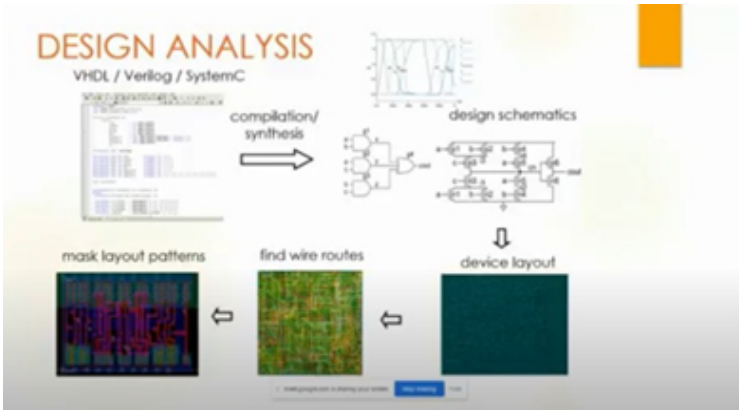
Scope of the area: AI Enabled IoT creates intelligent machines that simulate smart behaviour with little human intervention. This FDP aims to bring together researchers who work in the area of AI enabled IoT Networks.

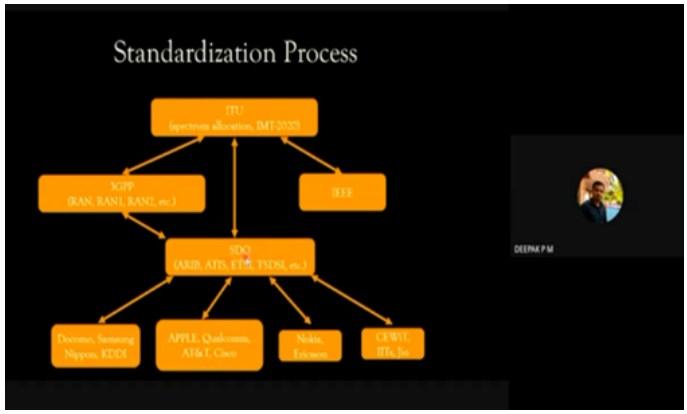




ONLINE WORKSHOP : PREVAILING TECHNOLOGIES IN VLSI, EMBEDDED SYSTEMS, PHOTONICS & FIBER OPTICS AND IOT

Dept. Of ECE organized a one week online Workshop for S7 students on "Prevailing Technologies in VLSI, Embedded Systems, Photonics & Fiber Optics and IoT" from 20/09/2021 to 24/09/2021). As part of the 2 day workshop, three online sessions by industry experts were conducted.





Ms. Lakshmi M, Analog Layout Engineer, Tessolve Semiconductors, Mr. Abhilash Surendran, Hardware Design Engineer, Smart Inforce Computing and Dr. Deepak P M, Lead Research Engineer, Centre of excellence in wireless Technology, IIT Madras campus handled the sessions. The rest of the sessions were handled by the faculty members of ECE Dept., giving insights in the current industry trends which may in turn motivate our students to take up some project topics in the related field, meeting the standards of the industry.

BPL COMPANY VISIT:

Officials from a Bangalore based biomedical company visited the laboratories of Department of electronics and Communication on 17th September 2021. Department planning for an MoU with the company. They will set up a laboratory in the campus where the students can get training and placements.

Welcome to Our new Head of Department

DR. BOBBY MATHEWS C

Our heartiest welcome goes to you. Congratulations on being part of a growing and dynamic team ECE we are honored to have a leader like you with us.

TECH TALKS

TEACHER'S ZONE

AUTHOR:
Dr. Bipin P R
Associate Professor,
Department of Electronics and Communication Engineering

RECENT INNOVATIONS IN AI APPLIED MEDICAL DIAGNOSTICS

Artificial Intelligence and Image classification can revolutionize the area of medical diagnostics. Apart from enabling early diagnosis of diseases, it can enhance the ability of radiologists to ease their duties by reducing the disease diagnosis time.
However, as IDTechEx has reported in its article 'AI in Medical Diagnostics: Current Status & Opportunities for Improvement, image recognition AI's current value proposition remains below the expectations of most radiologists. Over the next decade, AI image recognition companies serving the medical diagnostics space will need to test and implement a multitude of features to increase the value of their technology to stakeholders across the healthcare setting.

COMBINING DATA SOURCES THROUGH SENSOR FUSION

Radiologists have a range of imaging methods at their disposal and may need to utilise more than one to detect signs of disease. For example, X-ray and CT scanning are both used to detect respiratory diseases. X-rays are cheaper and quicker, but CT scanning provides more detail about lesion pathology due to its ability to form 3D images of the chest. It is sometimes necessary to follow up a chest X-ray scan with a CT scan to further investigate a suspicious lesion, but AI-driven analysis software can only process one or the other.
To enable efficient analysis of patient scans, image recognition AI software should be able to combine and interpret data from different imaging sources to gain a better perspective of the patient's pathology. This could generate deeper insights into disease severity and progression, thereby providing radiologists with a higher level of understanding of the condition of patients.
Some AI companies are already attempting to train their algorithms using data gathered from different imaging methods into one comprehensive analysis, but this remains a challenge for most. Recognising signs of disease in images from multiple modalities requires a level of training far beyond the already existing training process for single modality image recognition AI. From a business perspective, it is currently simply not worth it for radiology AI companies to explore this due to the sheer quantity of data sets, time and manpower required to achieve this. This suggests that sensor fusion will remain an issue for the rest of the coming decade.

MULTIPLE DISEASE APPLICATIONS

Another important innovation will be to apply image recognition AI algorithms to multiple diseases. Currently, many AI-driven analysis tools can only detect a restricted range of pathologies. Their value in radiology practices is hence limited as the algorithms may overlook or misconstrue signs of disease that they are not trained on, which could lead to misdiagnosis. Such issues could lead to a mistrust of AI tools by radiologists, which may in turn reduce their rate of implementation in medical settings.

In the future, AI algorithms will recognise not just one but various conditions from a single image or data set (e.g., multiple retinal diseases from a single fundus image). This is already a reality for numerous radiology AI companies. For example, DeepMind's and Pr3vent's solutions are designed to detect over 50 ocular diseases from a single retinal image, while VUNO's algorithms can detect a total of 12.

Detecting multiple pathologies from the same images requires expert radiologists to provide detailed annotations of each possible abnormality in a photo, and to repeat this process thousands or even millions of times, which is highly time-consuming and thus expensive. As a result, some companies prefer to focus on a single disease. Allocating the resources to achieving multiple disease detection capabilities will be worth it in the long run for AI companies, however. Software capable of detecting multiple pathologies offers much greater value than software built to detect a specific pathology as it is more reliable and has wider applicability. Companies offering single-disease application software will soon be forced to extend their product's application range to stay afloat in this competitive market.

ALL-ENCOMPASSING TRAINING DATA

A key technical and business advantage lies in the demonstration of success in dealing with a wide range of patient demographics as it widens the software's applicability. AI software must work equally well for males and females, and different ethnicities, for example.

While training deep learning algorithms to detect a specific disease, the training data should encompass numerous types of abnormalities associated with this disease. This way, the algorithm can recognise signs of the disease in a multitude of demographics, tissue types, etc. and achieve the level of sensitivity and specificity required by radiologists. For instance, breast cancer detection algorithms need to recognise lesions in all types of breast (e.g. different densities). Another example is skin cancer. Historically, skin cancer detection algorithms have struggled to distinguish suspicious moles in dark skin tones as changes in the appearance of the moles are more challenging to identify. These algorithms must be able to examine moles in all skin types and colours. From an image of a suspicious mole, the software should also be able to recognise the stage of disease progression based on its shape, colour and diameter. Otherwise, if an algorithm encounters a type of abnormality that doesn't match any of the conditions it recognises, it will classify it as "not dangerous" as it doesn't associate it with any condition that it knows. Having a diverse data set also helps to prevent bias (the tendency of an algorithm to make a decision by ignoring options that go against its initial assessment).

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Reduced neural network complexity

The architecture of AI models used in medical image analysis today tends to be convoluted, which extends the development process and increases the computing power required to utilise the software. Companies developing the software must ensure that their computing power is sufficient to support customers' activities on their servers, which requires the installation of expensive Graphical Processing Units (GPUs). In the future, reducing the number of layers while maintaining or improving algorithm performance will represent a key milestone in the evolution of image recognition AI technology. It would decrease the computing power required, accelerate the results generation time due to shorter processing pathways and ultimately reduce server costs for AI companies.

Imaging equipment neutrality

The installation of AI software for medical image analysis can sometimes represent a significant change to hospitals and radiologists' workflow. Although many medical centres welcome the idea of receiving decision support through AI, the reality of going through the installation process can be daunting enough to deter certain hospitals.

As a result, software providers put a lot of effort into making their software universally compatible so that it fits directly into radiologists' setups and workflows. This will become an increasingly desirable feature of image recognition AI as customers favour software that is compatible with all major vendors, brands, and models of imaging equipment.

Access to patient information and recommended treatment plan

Today, AI algorithms only have access to medical imaging data. As such, the condition and medical history of patients are unknown to the AI software during the analytical process. Because of this limitation, the software is restricted to locating abnormalities, providing quantitative information and, in some cases, assessing the risk of disease.

While these insights can be highly valuable to doctors, particularly when done faster and more accurately than human doctors, AI can do more. To utilise the full capabilities of AI and provide additional value in medical settings, software developers must focus on post-diagnosis support too.

Some skin cancer detection apps such as MetaOptima and SkinVision provide actionable recommendations for further action after an assessment is made. These include scheduling subsequent appointments for follow-up or biopsy or setting reminders for the next skin checks. Post-diagnosis support is becoming a desirable feature as it complements the doctor's evaluation, almost like a second opinion, and thus provides the doctor with more confidence in their assessment.

Ultimately, doctors seek a solution that aids them to establish viable treatment strategies. To achieve this, the software needs information relating to patients' electronic health records, clinical trial results, drug databases and more.

This goes beyond simple image recognition. Most companies currently have no confirmed plans to address this. Implementation of these systems will remain a work in progress for the next decade and beyond due to technical challenges caused by the overlap and interoperability required between various hospital and external databases.

EQUIPMENT-INTEGRATED AI SOFTWARE

The idea of integrating image recognition AI software directly into imaging equipment (e.g. MRI or CT scanners) is gaining momentum as it would facilitate the automation of medical image analysis. In addition, it avoids problems with connectivity as no cloud access is required. This is being done more frequently – recent examples include Lunit's INSIGHT CXR software integration into GE Healthcare's Thoracic Care Suite and MaxQ AI's Intracranial Haemorrhage (ICH) technology being embedded into Philips' Computed Tomography Systems.

A downside of integrating AI software into imaging equipment is that the hospital/radiologist has no flexibility to choose the provider/software that best suits their needs. The value of this approach depends on the performance level and capabilities of the integrated AI software, and if it matches the user's requirements. If that is not the case, hospitals are likely to favour cloud-based software.

TECH TALKS

STUDENT'S ZONE

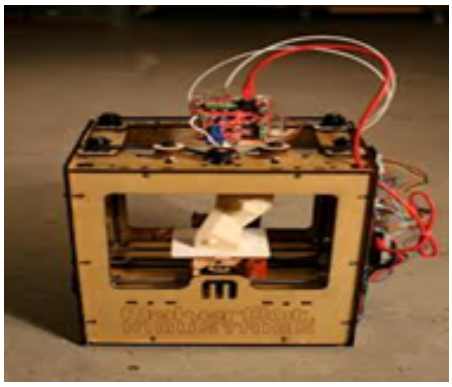
AUTHOR:
Ms. Hrithika S Pai and Ms. Nima T
2019-2023 batch
Department of Electronics and Communication Engineering

3D PRINTING :A MAGNIFICENT MANUFACTURER

It's the era of innovations, where we get to see a lot of developments in various sectors with a novel touch. From handwritten letters that took days to reach their destination to emails that reach within seconds, mankind is growing day by day. 3D printing is an appreciable innovation that contributes highly to the manufacturing fields, that fascinated not only industries but the whole society. Being a very economical, faster, and low-risk method, it's spreading each day.

Additive manufacturing or 3D printing is the process of construction of a three-dimensional object from computer-aided design(CAD). Materials such as plastic, liquids, or powder grains are used as raw materials, these are either deposited, joined, or solidified under computer control to create a three-dimensional object.

Murray Leinster



Gottwald"s patented printer

3D printer

Murray Leinster in 1945 is the one who introduced the general concept and procedure to be used in 3D printing through his short story "Things Pass By". Later in 1971, Johannes F Gottwald patented 3D printing which had the features of rapid prototyping and controlled on-demand production of patterns. Hideo Kodama in 1980 came up with two additive methods for fabricating three-dimensional plastic models with photo-hardening thermoset polymers. Now in the 2020s 3D printers have outreached the level of quality and cost that allows most people to enter the world of 3D printing as printers are more affordable and have fused deposition modeling.

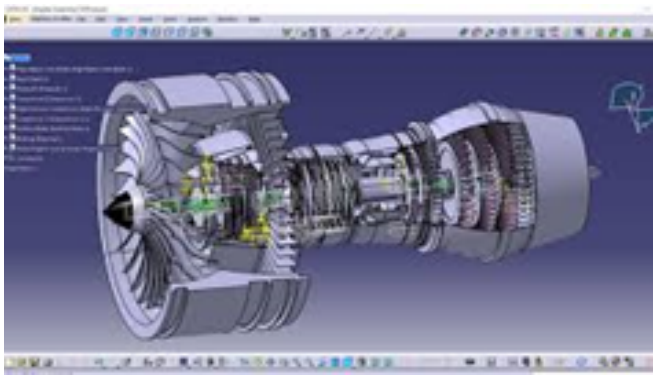
As said earlier 3D printing has wide uses, in food industries these take the role of developing food by squeezing out food that forms layers to a three-dimensional object. Nasa is looking forward to technology in order to create 3D printed food to limit food waste so as to make food designed to fit an astronaut's dietary needs. It has also stepped into the world of clothing where designers experiment with 3D printed dresses and shoes. Moving on to the transportation industry, additive manufacturing is beginning to transform both unibody(a single molded unit forming both the bodywork and base frame of a vehicle) and fuselage(main body) design and powertrain(mechanism of transmitting the drive from the engine of a vehicle to its axle) designs in cars, trucks, and aircraft. 3D printing has amazing potential in the medical field because it is useful for creating patient organ replicas for surgeons to practice before complicated operations. The ability to make prosthetics for patients has now become easier and creates a more natural fit and appearance.

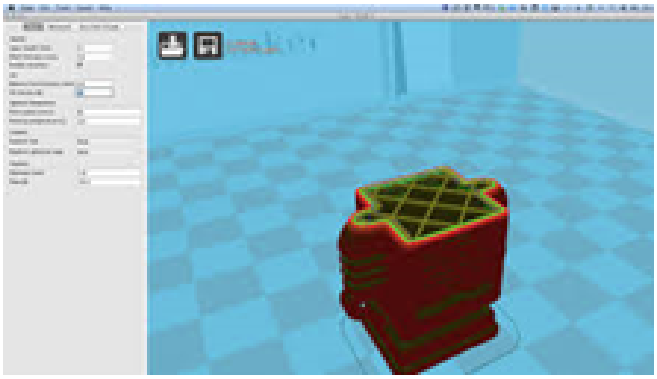
Prosthetics made through 3D printing

In order to create three dimensional objects using additive manufacturing, initially, the model is designed using CAD software, this software helps to create a model with fewer errors than other methods. Manually the models are created by feeding geometric data by the user whereas 3D scanning is also used where digital data about the object is collected to create a digital model. These CAD models are saved in stereolithography file format(STL). Before printing the object the STL files are examined for errors. There may be errors in output STL files of types like holes, noise shells, self-intersections, faces normals, etc. Then the process of repair is done to avoid those errors in the original model. These errors occur more in 3D scanning methods than manually produced ones because it is done by point-to-point acquisition. Once STL files are free of errors, they are processed by a software called "Silcer" which converts the model into thin layers and produces G-code(computer numerical control programming language). G-code files can be directly served to printers that have a 3D printing facility. Printer resolution gives the layer thickness in dot per inch or micrometer format. The layer thickness commonly is about 100 micrometers whereas some printers can print up to 16-micrometer thinness. The diameter of particles is around 50 to 100 micrometers, specifying higher resolution often results in larger files without improving quality. Though printer-produced resolutions are good enough for many applications, for more accuracy oversized versions of desired objects in standard resolution are produced and unwanted materials are removed using a high-resolution subtractive process.

A large variety of materials are used as raw materials for additive manufacturing. Plastic, carbon fibers, nitinol, resins, metal are some of these. Nitinol(a mixture of Nickel and Titanium) is used due to its superelasticity. Graphite and Graphene are known in 3D printing for their strength and conductivity and are widely used in touchscreens, solar panels, etc. Carbon fibers are used as a topcoat over plastic materials for giving strength to the plastic. In the current scenario, plastic made from polylactic acid(PLA), Acrylonitrile butadiene styrene(ABS), polyvinyl alcohol plastic(PVA) is the most common raw materials for 3D printing.

As of now, 3D printing is growing rapidly in society. It has become not only an industrial tool but also a consumer product. The 20th century is so lucky that inventions are quicker, even 4 D printing is being currently developed by many researchers and industries. 4D has an additional feature that the objects change shape with time, temperature, or any other stimulation. Let's look up to the future to see more exciting innovations and developments.





STAFF ACHIEVEMENT AND PARTICIPATION

Dr V T Gopakumar	Professor	Paper Presentation	Published a work in AICTE&IEEE Sponsored International conference Access'21
		Chair	Chaired and Co-Chaired sessions in the same conference..
Dr. Suraj Damodaran	Associate Professor	Tutorial Talks	Participation in the tutorial talks of the AICTE sponsored 2021 2nd International Conference on Advances in Computing, Communication, Embedded and Secure Systems (ACCESS)
		Chair	"Publication Chair" of the AICTE sponsored 2021 2nd International Conference on Advances in Computing, Communication, Embedded and Secure Systems (ACCESS)
		Workshop	Participated in "Five Day Workshop on Advanced Robotics"
		Reviewer	Certificate of Reviewer Recognition for IEEE SCI Journal
		Paper Presentation	Presented a paper entitled "Design and Implementation of Desired Interaction Yielding Fractional-Order Controller With Application to Wheeled Mobile Robot" for ACCESS 2021
		Reviewer	"Reviewer" of the AICTE sponsored 2021 2nd International Conference on Advances in Computing, Communication, Embedded and Secure Systems (ACCESS)
Prameela B	Associate Professor	Faculty Development Program(FDP)	ASIC DESIGN FOR DRIVING DIGITAL INNOVATIONS IN NEXT GEN PLATFORM
Neethu Suman	Assistant Professor	Online Course	Successfully completed NPTEL course on "The Joy of Computing using Python" with Elite Certificate
Prajeesh P A	Assistant Professor	Faculty Development Program(FDP)	Particiated in Tutorial talk of AICTE Sponsored 2021 2nd international conference ACCESS'21

NEETHA K	Assistant Professor	Faculty Development Program(FDP)	ATAL FDP ON "Green Communication"
			AICTE Training And Learning (ATAL) Academy Online Elementary FDP on ""AI Enabled IoT Network"
Divya V Chandran	Assistant Professor	Faculty Development Program(FDP)	AICTE Training And Learning (ATAL) Academy Online Elementary FDP on "Hyper spectral remote sensing and its applications"
		Faculty Development Program(FDP)	AICTE Training And Learning (ATAL) Academy Online Elementary FDP on "Remote Sensing and GIS"
		Any Others	served as a reviewer in the 4 t h International Conference on Big Data and Cloud Computing
Aswathy N	Assistant Professor	Webinar	Tutorial Talks AICTE sponsored 2021 2nd International Conference on Advances in Computing, Communication, Embedded and Secure Systems (ACCESS)
		Training Program	online training on IEEE Xplore
ARCHANA ANIYAN	Assistant Professor	Faculty Development Program(FDP)	ATAL FDP on "Research Issues in VLSI Design and Testing"
		Tutorial Talks	Participated in tutorial talks of the AICTE sponsored International Conference
Neema M	Assistant Professor	Tutorial Talks	Attended Tutorial talks AICTE sponsored 2021 2nd International Conference on Advances in Computing, Communication, Embedded and Secure Systems (ACCESS)
		Faculty Development Program(FDP)	Advanced Optimization Techniques and hands-on with MATLAB/SCILAB
		Reviewer	“Reviewer” of the AICTE sponsored 2021 2nd International Conference on Advances in

Savitha Raghavan	Assistant Professor	Tutorial Talks	Participated in tutorial talks of the AICTE sponsored International Conference
Anjana S	Assistant Professor	Tutorial Talks	Participated in tutorial talks of the AICTE sponsored International Conference
		Faculty Development Program(FDP)	Atal FDP on AI Enabled IOT Networks
Anjaly Gopinath	Assistant Professor	Tutorial Talks	Participated in tutorial talks of the AICTE sponsored International Conference
		Faculty Development Program(FDP)	Atal FDP on AI Enabled IOT Networks

STUDENT ACHIEVEMENT AND PARTICIPATION

2019-23	VIVEK SHANKAR	ABILITA	IEEE STUDENT BRANCH	
2019-23	SONA PAUL	Blockchain Foundation Program	Kerala Blockchain Academy	9/2/2021
2020-24	Vysakh Pradeep	Workshop: Ethical Hacking and Cyber Security	Blackhat Academy, IEEE SB SJCET PALAI	8/27/2021
2020-24	JAISON T POULOSE	Machine Learning and Image Processing	Cisco ThingQbator	8/26/2021
2020-24	ALEENA ANTONY	ECOFIESTA	STUDENT COORDINATION TEAM (IEEE)	6/4/2021
2020-24	ANUSREE A R	IMPERIUM	IEEE Industry Applications Society Chapter of IEEE Student Branch, ASIET	6/20/2021
2020-24	ANUSREE A R	Tutorial talks of the AICTE	Department of Electronics and Communication Engineering, ASIET	9/4/2021
2020-24	AARYA VINOD	Imperium	IEEE	
2020-24	ANUSREE A R	ORIGO	IEEE Signal Processing Society Chapter	5/30/2021
2020-24	FATHIMA MUHSINA	ECLATE Quote Making Competition	IEEE	
2020-24	Amrutha V	Aurea	Valaista	
2020-24	AARYA VINOD	Imperium and valaista	IEEE	
2020-24	Alvin Antony Lopez	Aurea	IEEE SB GECT	9/4/2021
2018-22	FARHAN NAJEEB	Investment Banking	JP Morgan	9/25/2021
2020-24	VYSAKH PRADEEP	DEVISE	IEEE SB ASIET	6/9/2021

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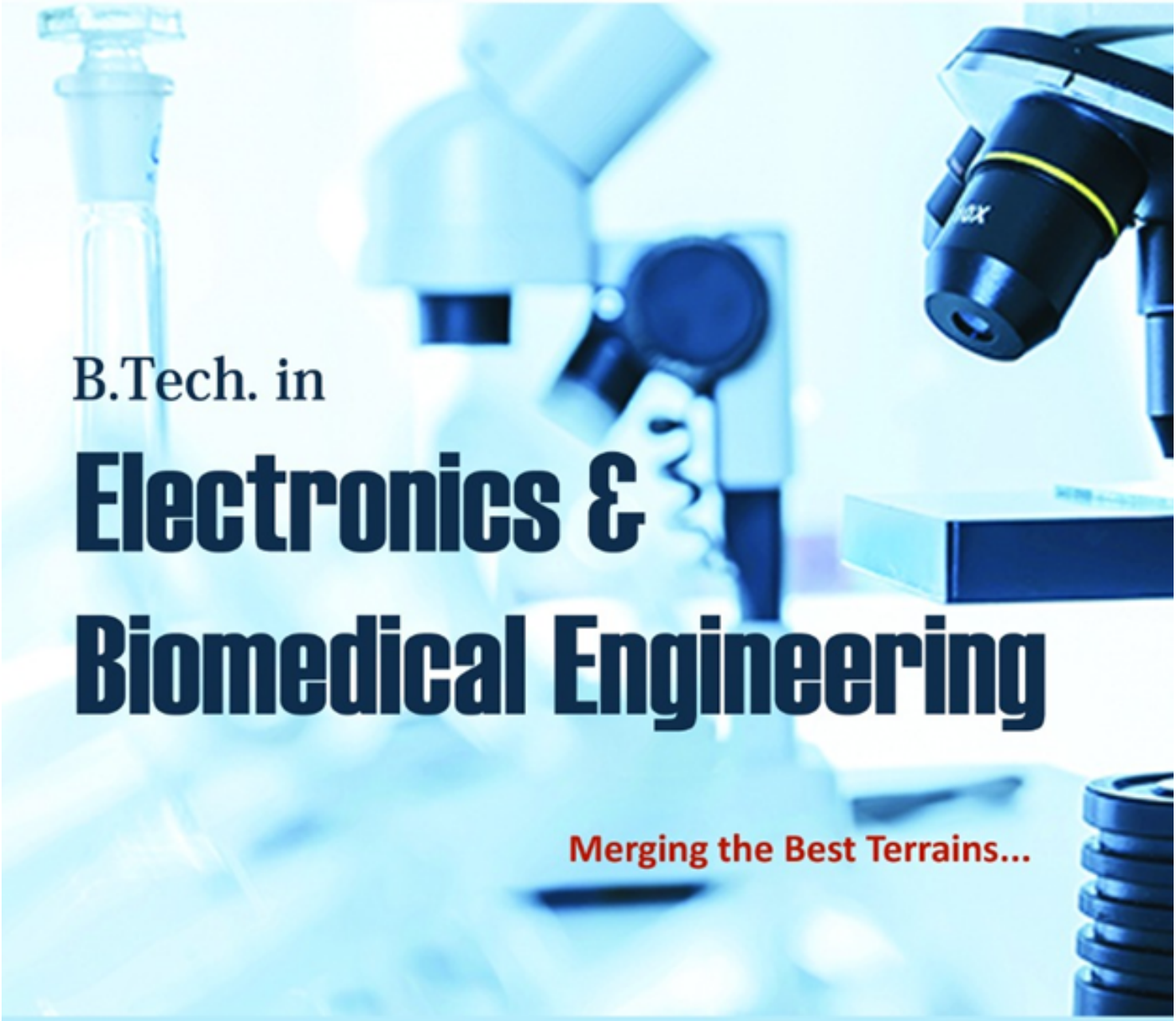

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