



# **B - SMART**

**WE EXPLORE WE EXHIBIT**

Name to Fame  
Hackathon Stories  
Technical Trends

Volume 6, Issue 1, April 2021  
ISBN : 97893-85101 - 70 - 0

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## **B-SMART**

(**B**VRITian **S**tudent **M**agazine on **A**dvanced  
**R**esearch & **T**echnologies)



## **VISION**

To emerge as the best among the institutes of technology and research in the country dedicated to the cause of promoting quality technical education.

## **MISSION**

- Achieve academic excellence through innovative learning practices.
- Enhance intellectual ability and technical competency for a successful career.
- Encourage research and innovation.
- Nurture students towards holistic development with emphasis on leadership skills, life skills and human values.

**B-SMART** is here to keep the students and the faculty members informed with the latest development in the area of science, engineering & technology. It also inculcates the habit of reading among students about new trends in technology and emerging areas and to provide a platform to the student for sharing knowledge.



## *Principal's Message*



**“We cannot direct the wind, but we can adjust the sails.”**

**– Dolly Parton**

**Dr. K. V. N. Sunitha,  
Principal, BVRITH**

The Pandemic continues... And so is the uncertainty associated with it... BVRITH HYDERABAD College of Engineering for Women is all set to sail with the wind. And we made success stories... Welcome all to the 11<sup>th</sup> edition of BSMART which is a platform to share our technical achievements.

Now we are in the limelight of receiving the ‘Best Engineering College for Women Award’ from the Telangana State Council of Higher Education. Our placements are going in high swing with 400 offers. Our students are busy preparing themselves for different events with the faculty supporting them in all possible ways.

We have Ms. Harshini, the IV year student of CSE as our Name to Fame face. We appreciate her for bagging a package of 27 lakhs in a prestigious company like Flipkart and we are also proud for making her worth and ready for such an achievement.

Our students have taken this challenging time as an opportunity to learn and grow. That is proved by their participation in various events. We have nine cover stories which show the prize winners during the last five months. Along with the achievements, BSMART also shares space with students and faculty for the articles related to the latest technology and appreciate the students who put their best efforts to search for one. The article which is selected for the student contribution this time is ‘HYDRALOOP - Smart water saving’ presented by Ms. Anita Jyothi of 3<sup>rd</sup> year ECE.

I congratulate the contributors of articles and the faculty and student coordinators who worked devotedly for giving rise to this edition of the magazine.

**Stay safe, Stay healthy.**

**With Best Wishes  
Dr. K.V.N. Sunitha  
Principal**

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## **‘Name to Fame’**



### **An Outstanding Performer and Achiever-**

I am Harshini Karumuri from the department of Computer Science and Engineering, batch 2017-2021. From an early age, my mom instilled in me the importance of writing thank you notes. I humbly take this opportunity to thank each and everyone of the college for always guiding and supporting me and bringing out the confidence in me to land in a prestigious offer with a reputed company such as Flipkart! From a very young age, I have always been interested in technology and how things work internally and

hence chose computer science. I was always a person who would keep her thoughts to herself, but once joining the college, through various programs I had to always push my boundaries both technically and academically and in the process I started voicing my thoughts very confidently. College helped me test and sharpen my skills at various platforms which gave me the chance to attend various events and hackathons right from Jugaad fest by Foss Asia to WIDS Datathon and being able to secure regional 3rd ranking the latter. Despite management having very busy schedules especially in this pandemic situation, they

**“There is no agony than bearing an untold story inside you.”**

astonished me every time with their motivational sessions which gave us the confidence to face any situation and achieve our dreams.

Due to lockdown when physical meetings are not possible, Principal ma'am always interacted with us consistently and made herself available to us 24/7. Madam's care and concern for us made virtual sessions seem physical. A special gratitude to the placement team, who made it possible for us to get these many opportunities when the whole industry itself is struggling in these extreme circumstances. Their valuable suggestions after every test and mock interviews helped me improve the areas where I was lacking once. I always doubted my skills not being upto the standards required to crack a job

at such esteemed organization. Yet faculty has always had faith in me and encouraged me to push my limits. The confidence with which I could answer all the questions in interviews was because of all the tips given. I sincerely thank the college for giving me the opportunity to be part of amazing programs such as WTEF, Being Zero training, Murugappan sir's training and ELITE(WISE) which helped a lot in my preparation and interview process. In conclusion, the talent is placed in the body like a rough diamond, and must be polished, or else the luster of it will never appear. So, I thank each and every one for polishing and helping me in achieving this huge success.

**We wish her 'All the Very Best' in her future endeavors.....**



**“The mind is not the vessel to be filled but a fire to be kindled.”**



## COVER STORIES

### COVER STORY – 1

#### **1<sup>ST</sup> POSITION IN FLIPRHAKATHON 6.0**



#### **Title :**

**Full Stack Web  
Development Task - Data  
Visualization**

#### **TeamMembers:**

**Ms. SreeramSravanthi**

**Ms. Kotte Soumya**

#### **Mentor:**

**Mr. Naresh Koenni,  
Asst Professor  
CSE Dept**

We, the CSE-III Students of BVRIT Hyderabad College of Engineering for Women participated in the online National Level Competition organized by FLiPR Innovation Labs, Bangalore, Karnataka, India. It brought us a platform where we could interactively learn from our co-hackers and from the experts. We had a great chance to collaborate with great minds to the industry experts through real-world projects.

We Secured 1st Rank position in online National Level Competition FLiPR Hackathon 6.0 on Full Stack Web Development Task - Data Visualization scheduled on 12,13,14th September2020 organized by FLiPR Innovation Labs, Bangalore, Karnataka, India. This Hackathon Hiring Program was completely online and was a 54-hour program. We are given a coding task on our registered Email ID on the day of the Hackathon i.e. Saturday, 12th September 2020 at 4:00 PM sharp. We were given 3 tasks (ML/AI, Mobile Application, Full Stack Web Application), So we have selected Full Stack Web Application using Angular. After the completion of the tasks, we have uploaded our codes on Version Control GitHub and deployed the code in server and shared the task on the form provided.

## **COVER STORY – 2**

### **3M CII YICA 2020 EXPERIENCE**

#### **Title :**

#### **MISSION CLEAN**

#### **Team Members:**

**Ms. T.Prathibha**  
**Ms. K.Namratha**  
**Ms. K.Meghana singh**  
**Ms. D.Bhavya**  
**Ms. S.Harika**  
**Ms. U.Anithajyothi**  
**(ECE-B3<sup>rd</sup> Year)**

#### **Mentor:**

**Mr. N. M. Sai Krishna,**  
**Assistant Professor, ECE**



**"Challenging";** That's the first word that comes into my mind whenever I think about my "3M CII YICA Awards 2020" experience. ". Our project name is "MISSION CLEAN - For a Better Future". The primary objective of our project was to eliminate the activated sludge process and costly membrane technologies which are being used in the secondary stage of the sewage treatment process. Our project sets itself apart from other projects by obtaining the output in less time and requires less space than the existing systems. The greatest asset of our project is the COD of our output sample. (Here COD is - Chemical Oxygen Demand). According to the norms given by TSPCB (Telangana State Pollution Control Board), the COD of treated sewage water should be 250mg/litre and our post-treated sample had a COD of less than 50 mg/litre. Working ahead of the schedule, we prepared one sample output, took pictures of the output and documented the process, elaborating the steps involved. . We explained to the jury about our project and presented them with the documentation. We were awarded a YICA badge, letter of merit and acknowledgement documents. Though we didn't win the competition, this experience helped us learn more about ourselves, and brought us together as a team to work for a single cause. This experience brought forth our competitive spirit and helped us refine in ourselves, the acceptance of failure, and the willpower to push on.

## COVER STORY -3

### **3<sup>RD</sup> PLACE AT HYDERABAD REGION IN WIDS DATATHON 2021**



**Title :**

### **WIDS DATATHON**

#### **Team Members:**

**Ms. T.Sarika**

**Ms. K.Harshini**

**(4<sup>th</sup> YEAR CSE)**

#### **Mentor:**

**Mr. L.Naveenkumar**  
**Assistant Professor**  
**IT Dept**

**Mr. U.Chandrasekhar**  
**Associate Professor**  
**CSE Dept**

The Women in Data Science (WiDS) Datathon is a data focused hackathon organized as a part of the Women in Data Science Conference at Stanford University.

Our college encouraged us to participate in this two-month long Kaggle based Hackathon with the two of our faculty as team members. Though four of us were Kaggle novices, we got acquainted with the platform. We thank those workshops for this. The journey through this challenge taught us a lot, as WiDS and gave us resources/industry mentors to tone our Data Science skills. WiDS introduced me to Kaggle.com which provides tutorials on Data Science related courses. Collaborative learning with various data scientists and the discussions we made with our faculty is the best part of this competition.

Our passion and enthusiasm for exploring data science made us stand at **85th position in the global Leader board** and securing **3rd position in Hyderabad region**. We were declared as one of the regional winners on 6<sup>th</sup> March during WiDS Conference. We were elated at this unexpected triumph.

We thank our college management and the faculty for the opportunity and guiding us at every step possible.



**“It is better to fail in originality than to succeed in imitation.”**

## **COVER STORY-4**

### **PRIZE WINNERS OF DESIGNATHON - 2020**



#### **Title:**

#### **JOBMATE**

#### **Team Members:**

**Ms. Gottimukkula Manasa**

**Ms. Arepalli Sindhura**

**(4<sup>th</sup> Year CSE-B)**

#### **Mentor:**

**Mr. U Chandrasekhar**

**Associate Professor**

**CSE Dept**

Hysea organized a six week long design-athon, a Student hackathon, focused on Design, organized by HYSEA in association with JNTU-H, TASK and The Devarakonda Foundation. The event was aimed at identifying and nurturing ideas and to encourage design thinking among students who were asked to design a digital platform which helps connect multiple organizational stakeholders to help students find matching jobs for their profiles. We have named our application as 'JobMate'. We have spent a lot of time thinking about a good and unique design for JobMate.

In our solution recruiters can post jobs and internships from their respective organization's profile. Students register themselves and search for matching jobs according to their profile. Faculty can give mentorship and suggestions to students. Placement officers can also maintain their college profile which helps recruiters to contact colleges for campus placements. Apart from the expected features we have included a chat section where students, faculty mentors and others can interact with each other. By creating wireframes on paper, using Adobe XD we have developed every screen carefully. Lastly, we have prototyped our whole application functionality. Finally, we could grab the winning award along with an internship that will be provided by HYSEA' partner companies.

## **COVER STORY-5**

**2<sup>ND</sup> POSITION IN WCNDI-2020**



**TITLE:**

**Prototype Design on  
Wireless Campus  
Network**

### **Team Members:**

**Ms. Khambampati Nikitha**

**Ms. Amgoth Geetha**

**Ms. Badhavath Kaveri**

### **Mentor:**

**Mr. Shivamurthy Hiremath**

**Assistant Professor**

**CSE Dept**

We the CSE-III Students of BVRIT Hyderabad College of Engineering for Women participated in the National Level Competition organized by Walchand College of Engineering is an autonomous engineering Education Institute in the city of Sangli, Maharashtra, India. The Problem statement is defined based on the Large Campus with Building to over 1 \* (Mobile + Laptop + Lab PC) students / Users (1: 3) Campus buildings with different departments to automate user registration. The solution is deployed Campus Series UniBox controllers in an active-active configuration design to handle 2000+ concurrent users with automated student registration using the approval-based method and MIS integration Enforced access and bandwidth policies for each group of users. It maintains access logs and browsing history of each student to avoid maximum access Points (AP) and with different Wireless LANs. The Unibox controller that provided full control, diagnostics, and usage analytics deployed for managing the wireless infrastructure Seamlessly integrated with existing Cisco and Ruckus infrastructure. The outcome of the results is a significant improvement in uptime of the WiFi network in the campus and reduced WiFi complaints by 50% and increased average browsing speed per student by 60%.

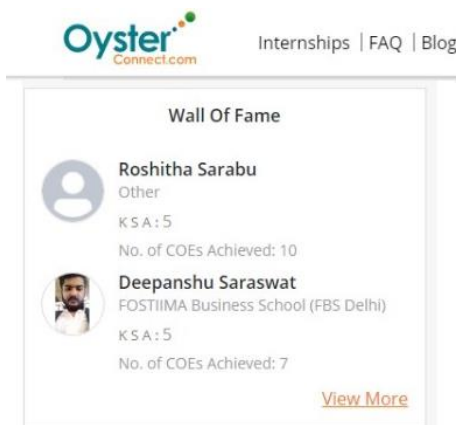


## **COVER STORY-6**

### **INTERNSHIP WITH 10 COE's**

**Ms. S.Roshitha**

**(EEE 3<sup>rd</sup> year)**



The job market today is a very competitive one and the talents, skills, and experience needed to be a part of that growth cycle are changing too. In order to gain experience and increase marketability and to improve Professionalism and Gain professional feedback, internship is a must for a budding professional course student.

I got an internship offer from as a campus ambassador for College Dunia through oyster connect during the lockdown period. The internship gave me a lot of learning insights. During the internship, I have received 10 Certificates of Excellence (being the only person who received that), with a KSA (Knowledge, Skills and Ability) rating of 5, which they rated as the all-time high in their records. I felt it as a proud moment when I heard that they have added me to the wall of fame with my KSA ratings and COEs, my position being on the top, even above the people who are doing post-graduation. The Certificates of Excellence were given to show the excellence in different fields like 100% Target achievement, Strategic Sourcing of Reviews, Networking, Acquisition Skills, Making Significant Efforts, Excellent Target Orientation, Excellent Networking Skills, Excellent Brand Ambassadorship, Consistent and Steady Output Champion Level Performance and Ability to take Challenges and efforts.

## **COVER STORY- 7**

### **1<sup>st</sup> POSITION IN MEDHANVESH2021**



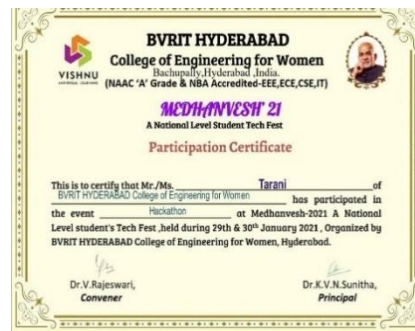
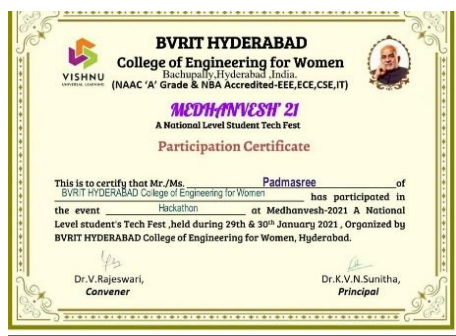
**Title:**  
**Electronic Log Book.**

### **Team Members :**

**Ms.Padmasree**

**Ms.tarani**

We, the students of CSE-IV of BVRIT HYDERABAD College of Engineering for Women participated in Virtual Hackathon, which was part of Medhanvesh 2021. Our project is maintaining an electronic log book for monitoring covid-19. This Electronic Logbook will specifically help colleges/schools/offices to manage the IN and OUT of its employees, students, and others stakeholders. This system also records Health Declaration Data of the people who enter the premises. This would be helpful to most of the organizations in this crucial covid time. The application can be deployed at the entry and exit points of any organization. Here, there will be a limit for members to register on the site. Once the proposed limit exceeds, the application will not be accepting any entries until an exit gets recorded. The limit can be changed based on our requirement. This helps in limiting the number of people inside the organization to implement Covid-19 guidelines. We can even download the log reports using this system.



**“All progress takes place outside the comfort zone.”**

## **COVER STORY: 8**

### **2<sup>nd</sup> POSITION IN MEDHANVESH.**



### **Title: Smart Hat for Social Distancing.**

### **TeamMembers :**

**Ms. B.LakshmiTejaswini**

**Ms.S. Aishwarya**

**Ms.G. Sushma**

### **Mentor:**

**Mr.R. Guru Swamy**

**Associate Professor**

**EEE Dept**

We, the EEE 2<sup>nd</sup> year students of BVRIT HYDERABAD participated in “MEDHANVESH 21”. It was a great opportunity to present our idea in the form of business model. Our problem description is about social distance in this pandemic situation. This is a very basic project done for the present scenario in which a wearable device has been developed such that the person using this device can maintain a proper distance of 6 feet from surrounding people. With this idea, a project has been developed for the Hackathon during MEDHANVESH 21. We used four ultrasonic sensors which have 30° wideness and a code has been written in such a way that when a person is within 6 feet of the sensor or hat the buzzer goes off. When the hat is not in use, it can be manually turned off, vice versa. We consider this project innovative and creative. It is our own idea. Presently the Arduino is powered by battery. In order to make it more energy efficient, we decided to use a solar panel. The small solar panel attached to the hat is connected to the voltage controller and that voltage controller is connected to the Arduino. This device can also be very helpful to visually impaired people. We want to make variations of this project, so that it can be implemented in some smaller device such as pen or some other wearable devices which is more regularly used. This is how our project has been developed. As engineers, we love building stuffs and hackathons are one way of achieving satisfaction of building something in a short duration.

## **COVERSTORY:9**

### **Winners in NeoCodeathon**

### **Team Members :**

**Ms.Kavya Swamy**

**Ms.Prathyusha Gogulamudi**

**Ms.Sarabu Roshitha**

**Ms.Keerthi Krishna**

**Ms.Pagidimarri Sreejasree**

**Ms.Gudiboina KavyaSree**



### **Mentor**

**Mr. G. Sandeep**

**Associate Professor,**

**EEE DEPT**

NeoCodeathon is a coding contest conducted by iamneo.ai. There are two rounds in the Codeathon. First round is the prelims and it is for 3 hours. The shortlisted candidates received an email invite for the final round. device. The top 100 winners of the Codeathon were offered a five day free placement training from the IT product company experts. The worth of the training and assessment for one student is 10,000 INR. The thought that we are EEE students, competing with CSE students from the whole country made us nervous. But we decided to go forward with the confidence that we are equally competent. On 5<sup>th</sup> April results were announced and we all were delighted to be selected as Neo Codeathon winners in the National level. 112 members were shortlisted for bootcamp. Securing top 18,64,75,79,80,82 position all over India competing with CSE & IT students made us immensely proud and more confident. We learnt that our hard work and determination will help us grab all the opportunities in our way and lead to success.

**“If you really want to do something, you'll find a way. If you don't, you'll find an excuse”**



**26** JANUARY  
**INDIA**  
**REPUBLIC**  
**DAY**



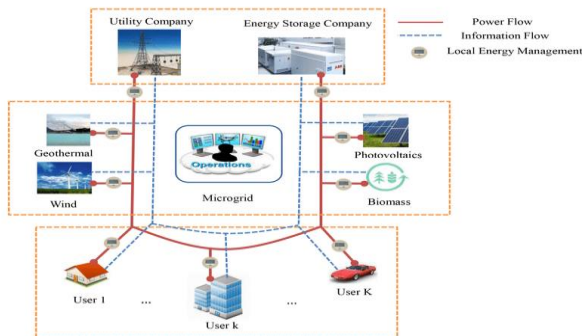
**“Success is not in what you have, but who you are.”**



## TECHNICAL TRENDS

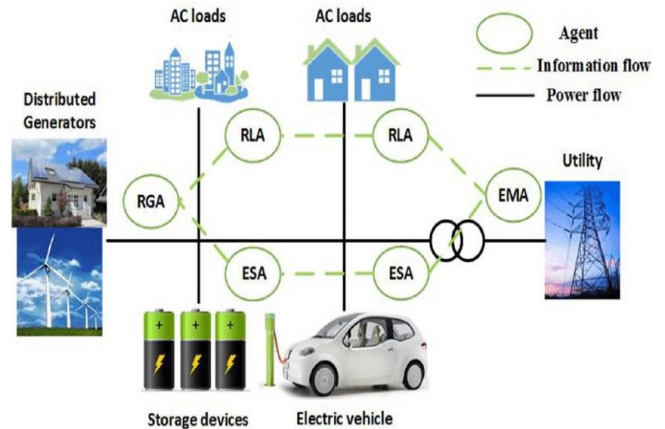
### Energy Management System of a Micro grid Using Multi agent Systems

Microgrid is customized by the integration of distributed energy resources and controllable loads in a power distribution network. Microgrid assimilates several energy resources assuring to generate clean energy, to have reliable operational procedures and to enhance the energy supervision and management arrangements. Energy Management System plays a vital role in microgrids due to presence of intermittent sources of energy. An EMS is a system of computer-aided tools used by operators of electrical utility grids to monitor, control and optimize the performance of generation system.



The conventional method using Supervisory Control and Data Acquisition Systems(SCADA) usually operate in a centralized manner and they automate, coordinate, interact, and monitor the operations of subsystems located in remote locations. The intermittent behaviour of distributed energy resources reflects uncertainty in SCADA systems as sensor data cannot be interpreted. Due to the multiple interacting agents in Multi-agent systems can mitigate challenges better than SCADA systems. MAS's are more successful in controlling the distributed energy resources due

to reliable communication and organized structure. For reliable operation in a micro grid, continuous monitoring and controlling should proceed for wind power, solar power, battery levels and loads and dynamic pricing. MAS is particularly useful for designing distributed systems requiring autonomy of their entities. It can be scaled up by adding other agents or by dispersing them in new environment with new resources and capacities.



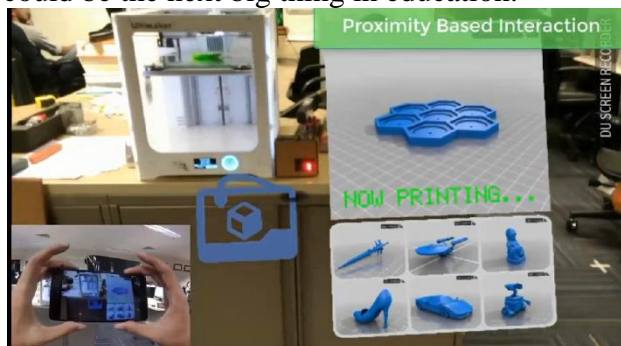
MAS can find solutions for the issues in micro grids such as interaction between sources, voltage regulation, frequency regulation etc.

**Ms.B.Sujatha**  
**Associate Professor**  
**Department of EEE**



## Essentiality of Modern Technologies AR& VR in Classroom Education

One of the upcoming leading technologies is augmented and virtual reality is becoming more prominent utilization in classroom and educational settings. In India, Children of age 10 to elders of many are engaged with their smart phones, intervention of AR in teaching learning could be the next big thing in education.



The video link shown is an example of how well AR could be influence the classroom teaching learning methods. By the smart choices, students can be making about the selection of learning materials that will be most suited to the task at hand. By scanning the covers of textbooks, students get a short description of what they're about to learn. Augmented reality is known for visual stimulation and interactivity to have better educational experience with fun for a young and restless group of people who has gotten used to. AR developers should come up with more Apps, AR resources, AR-enabled worksheets that are to be used in the all levels of classroom. This will aids the students to explore educational content at their own time.

### *VR Content Making*

Instead of 2D or 3D image visualization, an experience, that makes the student to feel 'complete', by seeing the images in 360 degrees. Each student may have their unique experience by visualizing the image in 360 degree form. They can be visualizing unseen remote places. Historical monuments can be seen very near and clear. They can experience the locations as if they were at the near end of the it. Teacher can make

a Class VR using various 360 degree images as a huge resource bank, by categorizing them as per requirement. If they are grouped in a way, then it will be easy to access by students as per their requirement. If images are stored using their detailed description, facts and even key questions, then, while accessing images can be picked up based on educational content, topic or using keywords. Teacher can make their portals using ClassVR to work easily with 360 degree cameras. Further, the students can explore more on to the content and use cameras to capture the photos. The same will be added into resource bank by teachers to use them in the portals. As an example, industrial visits by students can be shared with non-attendant students in the form of 360 degree image to view it in ClassVR headset.



### *Hybrid Reality*

Students can explore many scenes using VR and can feel the reality around the information. Many scenes have abundant information to visualize the exploring, explaining and researching. This kind of learning makes the student to map their imagination with actual real world content in a highly proficient way. This kind of learning allows the students to have depth knowledge to answer the key questions that may be asked by teachers, and encourage peer group discussions. This kind of learning by VR scenes can be used in many different areas of learning, across all

curricula. The scenes can be selected as per curriculum. Teachers can create their own scenes by collecting pictures from various sources to make it as hybrid reality finally.



### *3D Models*

Most importantly, Augmented Reality can be used in visualizing the educational content with near reality appearance such that students can feel the content and this can be possible using 3D models. For this, the students should use their visual headsets along with front cameras. This proves enriched information with great involvement, better understanding and ultimately knowledge retention.

### **Reference:**

<https://www.purdue.edu/newsroom/releases/2020/Q2/hands-on-with-augmented-reality-in-remote-classrooms.html>

**Dr. M. Parvathi,**  
**Professor**  
**Department of ECE**



## **Block chain behind Cyber security**

The global cyber threat continues to evolve at a rapid pace, with a rising number of data breaches each year. Medical services, retailers and public entities experienced the most breaches, with malicious criminals responsible for most incidents. Some of these sectors are more appealing to cyber criminals because they collect financial and medical data, but all businesses that use networks can be targeted for customer data,

With the scale of the cyber threat set to continue to rise, the InternationalData Corporation predicts that worldwide spending on cyber security solutions will reach a massive \$133.7 billion by 2022. Governments across the globe have responded to the rising cyber threat with guidance to help organizations implement effective cyber-security practices. Uplifting organizations to the Blockchain is called consumer genomics.



### **Authentication and Authorization control**

In public Blockchain, there is no need to control network access as everyone has the right to participate and access the entire network. But private Blockchains require appropriate security controls to protect network access from unauthorized users. Also, organizations have to secure the consumer's as well as employee's identities.

### **Threat Intelligence**

Threat intelligence is a high-level process that involves gathering valuable insights about an emerging or existing cyber threat. But the major issue related to threat intelligence is that companies spend a lot of time researching the same threats, while others are left unnoticed.

### **Blockchain's solution to reduce Cyber Risks**

Cyber attacks become more frequent and intense due to advanced ransomware, in the professional organizations that ignore cyber security. Blockchain describes itself as a peer-to-peer(P2P), decentralized distributed ledger that operates without involving any central authority. Due to its decentralized, immutable, and transparent nature, Blockchains can help in improving cyber defence and preventing fraudulent activities from taking place.

Blockchain has evolved significantly from the distributed ledger technology, can empower users

to have greater control over their own identity. Organizations can use the information only with customers' consent. Blockchain has facilitated **self-sovereign identity**, which is inherently unalterable and more secure than traditional identity systems. Individuals and organizations would use their self-sovereign ID to verify their identity, removing the need for passwords. Also, backed by Blockchain innovation, the solution gives individuals, total privacy and control of their personal information, while making data shareable on a trusted network, and ensuring security of identity transactions. If by chance an attacker or any third-party gains access, then in that case, he will not be able to read or retrieve any information stored on the Blockchain network as Blockchain helps maintain confidentiality by utilizing strong cryptographic algorithms.

Self-Sovereign Identity Allows Users To



Blockchain, with its decentralization, peer-to-peer oriented architecture, can help in maintaining synchronization between different parties, thus transforming the threat intelligence process. Blockchain's decentralized infrastructure acts as an anti-tampering infrastructure that helps detect everything in real-time.

Even if an attacker tries to delete every proof of his presence by deleting every log which can link him with an incident, Blockchain's immutable design does not let it happen.

#### Reference:

<https://www.nec.com/en/global/solutions/blockchain/blockchain-for-digital-identity.html>

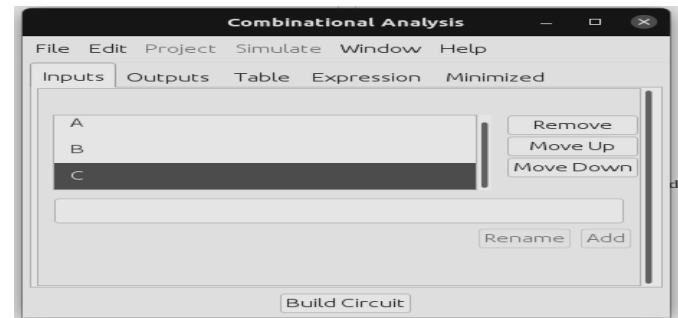
**M.Sudha Rani**  
Assistant Professor  
Department of IT



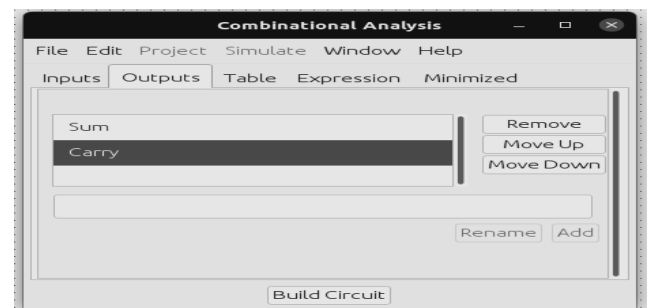
## Build Circuit Design Using Truth Table

### Why LOGISIM?

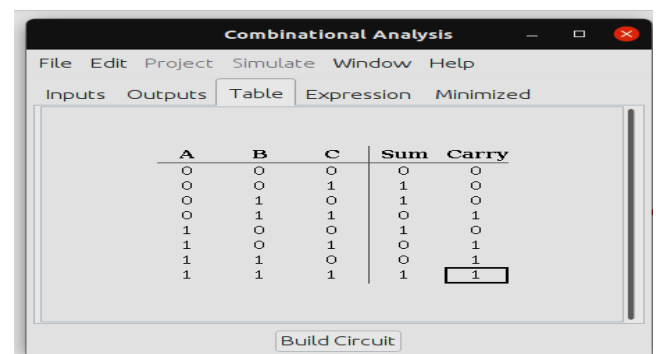
LOGISIM is an opensource tool. LOGISIM users can design any combinational logic circuit without the knowledge of using Boolean Algebra, K-Maps or Quine McCluskey methods.



**Fig 1:** User needs to **Add** input variables A,B, & C

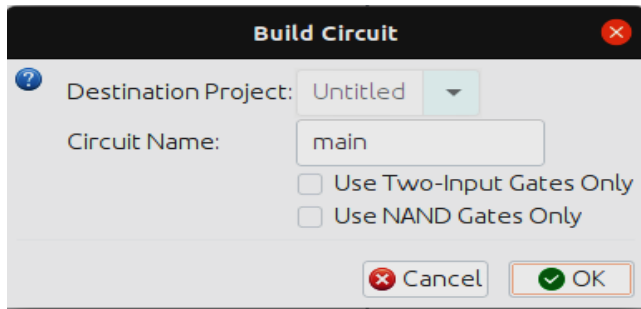


**Fig 2:** User needs to **Add** output variables Sum & Carry.

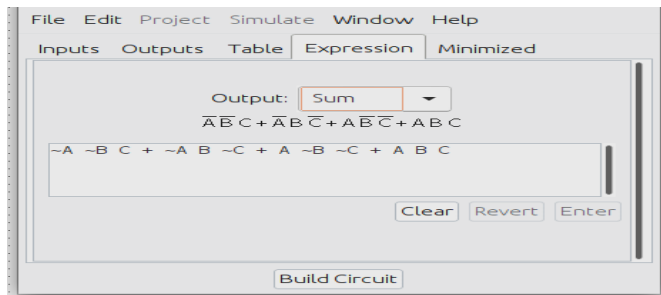


**Fig 3:** User needs to enter the truth table for Full Adder as shown above. Click on **Build Circuit**.

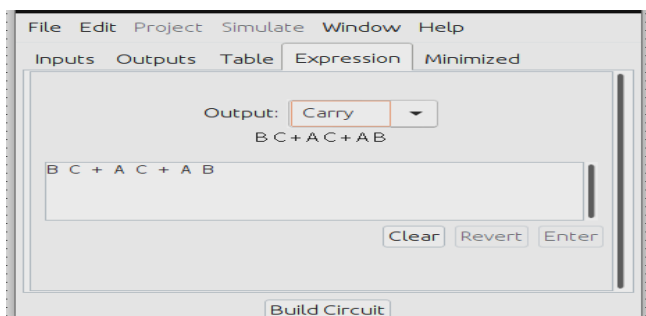




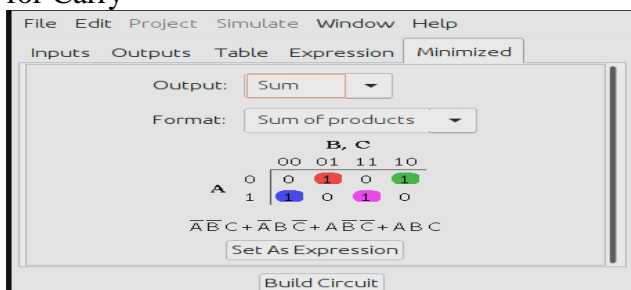
**Fig 4:** We have two options only with NAND Gates or using any Two-Input Gates only. We have selected NAND Gates option. Clicked on OK.



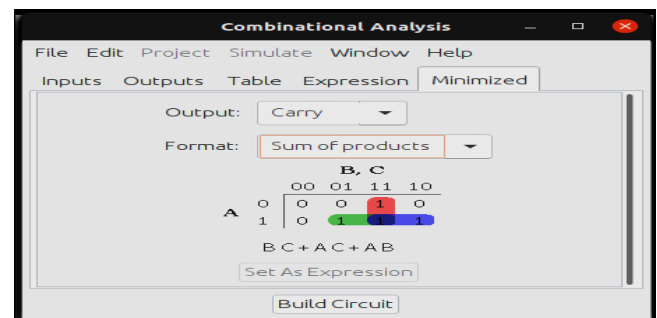
**Fig 5:** Click on **Expression** Tab. Select **Output** as **SUM**. System generated Boolean Expression for SUM.



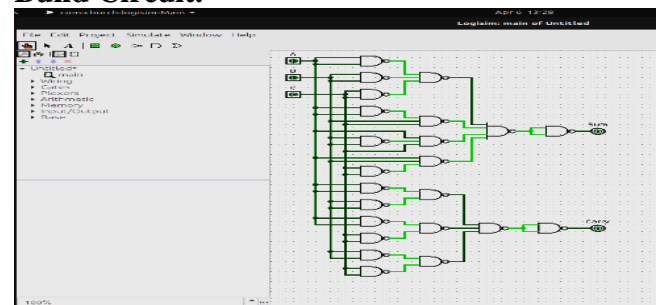
**Fig 6:** Click on **Expression** Tab. Select **Output** as **Carry**. System generated Boolean Expression for Carry



**Fig 7:** Click on **Minimized** Tab. Select **Output** as **SUM** & **Format** as **Sum of Products**. System generated K-Map for SUM using SOP. Click on **Build Circuit**.



**Fig 8:** Click on **Minimized** Tab. Select **Output** as **Carry** & **Format** as **Sum of Products**. System generated K-Map for Carry using SOP. Click on **Build Circuit**.



**Fig 9:** Result of **Build Circuit** using **NAND Gate only** option. We can click on inputs A, B or C to change the inputs to '0' or '1' and can visualize the output for SUM & Carry as shown in the Truth Table.

### How is it smarter?

1. Designing with Truth Table.
2. Using simple logic gates (Ex: - only NAND, NOR / combination of NOT, AND, OR)
3. No need of applying K-Maps by the user.
4. Easy system generated reduced Boolean Expression.
5. Simple conversion between SOP and POS.
6. Build Circuit design & validate it through simulation.

### Reference:

<http://www.cburch.com/logisim/>  
<http://www.cburch.com/logisim/download.html>

**Dr. Nara Sreekanth**  
 Associate Professor  
 Department of CSE





## Collaboration of Human and Artificial Intelligence (AI) Algorithms for Organizations' Decision Making

Artificial intelligence (AI) is transforming all sectors of the economy. But there is no reason to fear as robots are replacing all human employees. Humans need to perform three crucial roles. They must train machines to perform certain tasks; explain the outcomes of those tasks, especially when the results are counter intuitive or controversial and sustain the responsible use of machines. Organizations need to train AI agents, explain their outputs and make sure they are used responsibly. AI agents, in turn, can assist people with information gathering, data crunching, routine customer service and physical labor, thereby freeing them for higher-level tasks that require leadership, creative thinking, judgment, and other human skills. Not all algorithms are AI and not all AI is Machine Learning (ML). Human– Machine Learning (ML) collaboration for decision making is different from other forms of human interaction with the adoption of technology because of the potential for mutual adjustment. Both humans and AI based on machine learning algorithms are adaptive systems that change how they make decisions over time through learning from experience (i.e. past data).

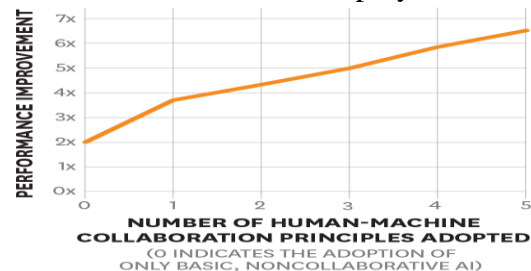
### Is Human-Artificial Intelligence Collaborative decision making precious?

Taking an organization design perspective on the problem of Human-AI Collaborative Decision. Making require an organization to view the combination of the human and the algorithm as an organization- i.e. a multi-agent, goal-oriented system. The goal of Human-AI Collaborative Decision Making is to produce a decision. The design of the organization constitutes the choices. The end goal is that organization's need to understand the mathematics behind

cooperation with people and what attributes Artificial Intelligence (AI) needs to develop social skills. Organizations get benefited from optimizing collaboration between humans and artificial intelligence.

### Five principles that help Organization's do so:

1. Re-imagine business processes.
2. Embrace experimentation/employee involvement.
3. Actively direct AI strategy.
4. Responsibly collect data.
5. Redesign work to incorporate AI and cultivate related employee skills



### Conclusion:

Collaboration of Human and Artificial Intelligence(AI) boost the organizations analytical and decision-making abilities and heighten creativity.

Most activities at the human-machine interface require people to do new and different things and to do things differently.

### Reference:

<https://hbr.org/2018/07/collaborative-intelligence-humans-and-ai-are-joining-forces>

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Management Studies,  
Department of BS&H



## ADIBOT – Disinfecting Robot

The UV-C disinfection robot, ADIBOT, was unveiled by UBTECH Robotics as the latest addition to its series of advanced robotics. It has brought a cost-effective disinfection solution to the forefront in the fight against COVID-19 and some other viruses during the ongoing disease outbreak. The ADIBOT system is a safe way to help corporations, communities, and educational institutions restart by inactivating dangerous viruses in places where people need and would like to be without using hazardous chemicals or incurring costly downtime.



The UV-C models in the ADIBOT system are the stationary ADIBOT-S model and the autonomous ADIBOT-A model. The ADIBOT-S is a static purification bot that must be physically positioned in the required sanitization area. ADIBOT-A is a self-contained approach that can be designed and configured to manage one or more floor plans independently. Both ADIBOT systems offer 360-degree radiant light distribution, powerful UV-C disinfection, and smart safety features like “risk mitigation” cameras, PIR sensors, sensor-enabled safety signage, and an emergency remote control.

**ADIBOT-S CORE FUNCTIONS:** Mobile UV-C Disinfection Flexibility, Powerful UV-C Disinfection, Secure Mobile Integration.  
**ADIBOT-A CORE FUNCTIONS:** Autonomous Disinfection Patrol, First-Rate Safety, Strong UV-C Disinfection.

**Reference:** <https://www.ubtrobot.com/products/adibot?ls=en>

**Akanksha Kacham**  
**ECE-B 2<sup>nd</sup> Year**



## Cybersecurity Mesh

Cybersecurity mesh is a distributed architectural approach to scalable, flexible and reliable cybersecurity control. This growing vital trend comes as more and more assets are now existing outside the traditional security perimeter. With digital technology making inroads and penetrating into almost every aspect of our everyday lives, more and more enterprises are adopting to technology-based modes of operating their businesses. This has resulted in an increase in demand for cyber security professionals like never before. While Cybersecurity only focused on building a perimeter wall around the physical organization and network with traditional firewalls and anti-virus software. Cybersecurity mesh works advance than cybersecurity as its concept recognizes that networks have no physical boundaries.



It builds a security perimeter around each individual user, allowing them to securely access assets from any location and device. In this model, policy enforcement would be performed through a cloud service at the asset itself rather than a device. This allows IT network managers to better maintain and keep track of differentiated levels of access to

different parts of a given network, and to prevent hackers from exploiting a given node's weakness in order to access the broader network.

**Reference:**

<https://www.bocasay.com/cybersecurity-mesh-it-development/>

**Harshini Mukka**  
IT-A 2<sup>nd</sup> Year



## Missing Wires!!

Have you charged your phone today? Of course, you have! In a world brimming with all sorts of information every single day one can't risk missing out on daily if not hourly updates merely because your phone hasn't gotten its daily shot of energy. In the span of 1.5 hours that a smartphone takes to charge itself, approximately 1,34,56,170 mails; 1,368 million messages and a lot more types of information are shared globally. The sheer amount of data being shared is mind-blowing & Xiaomi is at your service to help stay connected.

Xiaomi presents you its latest Mi Air Charge Tech, which lets its user use their devices while simultaneously getting charged remotely. Yes, you heard it right! You are no longer bound to a wall socket or a charging pad. By means of spacepositioning and energy transmission, the Mi Air Charge Tech provides 5W of remote power for a single device. Multiple devices are also supported despite the presence of physical obstacles until a boundary of few meters.

It is all thanks to the isolated charging pile, which in simpler words is a special self-developed tower/box like device that this marvel is no longer a dream. This device houses inbuilt

5-phase interference antennas which help in detecting the location of the smartphone. Through beamforming, the 144 antennas transfer millimeter-wide waves. Wondering what beamforming is?



Let's break it down to understand our devices better. Beamforming is a process that involves processing signals in order to transmit/receive signals which are directional in nature. This can be achieved by combining elements in antenna arrays in such a way that signals at particular angles experience constructive interference while others experience destructive interference. In order to change the directionality of the array, a beam former controls the phase and relative amplitude of the signal at each transmitter, in order to create a pattern of constructive and destructive interference in the wave front. And while receiving, information from different sensors is combined in a way where the expected pattern of radiation is preferentially observed. Now since that is out of the way let's proceed to see how the latest Air Charge Tech functions. The waves sent by the charging pile are received by the antenna array designed for smartphones. The 2 internal components of the array: beacon antenna & receiving antenna array display the position of the device with low power consumption and help convert the waves from charging pile into electrical energy respectively. These waves are converted by the pre-fitted 14 antennas through a rectifier circuit. Speculations that this technology would also broaden to include other smart devices under its wings is the cherry on top. But the definite aspect of this tech burning a hole in our pocket is one that cannot be ignored. However, it is

unclear as to when this exhilarating technology will be available to its consumers as currently it is just the prototype we are talking about, but it does seem that the truly “wireless” aspect would be worth the wait.

**Reference:**

<https://www.bgr.in/news/xiaomi-mi-air-charge-tech-charge-phones-over-the-air-how-it-works-936922/>

**JyothiVummadi**  
CSE-AI&ML 1<sup>st</sup> Year



### 3-D Printed Human Heart Model

American researchers say they have created the first full-size human heart model using 3D printing technology. The model was made with a specially developed 3D printer that uses biomaterials to produce a structure and tissues similar to a real human heart. The researchers say the model heart can be a useful tool to train medical professionals in operations related to human heart function. It could also be used as a basis for new research on ways to use 3D printing technology to produce fully operating hearts to replace in people. The research was led by an engineering team at America’s Carnegie Mellon University. Results were recently published in a paper in ACS Biomaterials Science and Engineering.



The team was led by biomedical engineering professor Adam Feinberg. The team had already developed a 3D printer that could “bio print” collagen. Collagen is the main structural protein that is found in tissues throughout the human body. The goal of the latest project was to use this same bio printing technology to create a realistic, full-size model of a human heart. Scientists have made 3D printed models of the human heart before. But those models were made of harder substances – such as plastic or rubber – that were not effective in copying the soft tissue material found in the human heart. The new 3D printing process was also not easy because soft materials, such as collagen, start out as a liquid. When such substances are printed in air, they quickly collapse during the process. So the researchers came up with their own method to 3D print soft materials. The method uses a gelatin substance to surround the structures during the printing so they do not collapse. The team’s new model heart is made from a material called alginate, a soft, natural substance made from seaweed. We might be at the early stages of using 3D-printing for organs. But, in one- or two-decades’ 3D-printers could indeed be found at several hospitals around the world.

**Reference:**

<https://engineering.cmu.edu/news-events/news/2020/11/18-3d-printed-heart.html>

**V.Raghamala**  
EEE 3<sup>rd</sup>Year



### Aleo E Cell

ALEO VERA, well known as a moisturizer, soothing agent, detoxifier and also in clinical uses and cosmetology. But ever thought of



generating electricity from it? sure it does. Engineering graduates Nimisha Varma of Lucknow and Naveen Suman of Rajasthan developed a startup of manufacturing aloe vera based batteries. Batteries are considered as domestic hazardous waste but have no proper disposal measures as a result we throw them in household dustbins which finally end up in landfills releasing toxic materials and metals which can cause explosions. These chemicals are also deleterious as they cause harm to both humans as well as environment. Batteries are removed when only 70-80% of its energy is used leaving 20-30% wasted. On an average, India generates 62 million metric tonnes of waste annually. In which 82% are E-waste out of which 78% is the dry cell batteries. 97% of materials used in these batteries are imported from different countries around the world levying more than 148 billion dollars on Indian economy. ALEO-E-CELL is a revolution in manufacturing of batteries, replacing toxic metals in a dry cell.



#### COMPOSITION:

Aleovera gel naturally comprises 0.8-0.9V and a few minerals such as calcium, magnesium, zinc, chromium, selenium. Along with aleovera gel a few herbal extracts are added which are used in cosmetics.

#### WORKING PRINCIPLE:

Plants like aloe vera that stores high extent of water, have the potential of containing higher conductivity so that they can conduct more current by the movement of ions present in gel. So the chemical energy in gel can be converted

to electrical energy and this electrical energy can be stored in the cell.

#### CHARACTERISTICS OF ALEO-E-CELL:

Gives 1.5 volts of potential which can replace the dry cell and alkaline batteries of AA and AAA size and can be used for low to high drain devices. 10% less cost than the existing batteries (Rs.9 to 10). Anti-leak locks provide leak protection. No soil, air, water pollution and no contamination of food chain.

**DISPOSAL:** Can be easily recycled or refilled.

Can be used in clocks, toys etc. 1.5% more durable than the existing batteries.

#### ADVANTAGES:

Saves USD 109 billion in Indian economy on dry cell raw materials every year. 71.6% reduction in environmental pollution Reduces 97% of diseases caused by these dry cells. It can be productive for Indian farmers encouraging to grow more aloe vera trees. 100% eco-friendly and non-hazardous. It is necessary to foster such innovations in order to overcome global warming and pollution.

#### Reference:

<https://www.cnbctv18.com/technology/national-start-up-awards-winners-meet-the-techies-who-made-eco-friendly-batteries-from-aloe-vera-7131061.html>

**K.Sai Tejaswi**  
IT-A 1<sup>st</sup> Year



## Fuel to EV & AI Technology

As the fuel reserves deplete at a rapid pace and the growing impact of climate change begins to pose a serious risk to our current and future generations, the world is waking up to the need for sustainable mobility solutions and, the discussion is the electrification journey.



In India, electrification is finding a new evolved space in all discussions and debates. The Prime Minister's initiative of a first-ever Global Mobility Summit (MOVE), last year, gave a unique platform to the industry and the related stakeholders to kick-start the mandate of defining the electrification roadmap for India.



We have challenges as well as opportunities in our way to electrification. Availability of charging infrastructure, readiness of battery manufacturing capacity, customers' range anxiety are the key concerns. However, we have seen a positive thrust coming from the government in the form of FAME incentives and providing relief by tax and registration sops. As an OEM with the launch of our Nexon EV, India's first own EV, we are gearing up for an attractive range of aspirational and affordable products in the EV space in the years to come. We will find our own solutions, by building a comprehensive 'One Tata' ecosystem, as it is the Tata uni EVerse. We believe EV's have the potential to go mainstream.

Additionally, the Tata E-Vision Concept boasts advanced technologies like cloud computing, analytics, human-machine interface, ADAS autonomy and geospatial mapping. While most of these techs can be considered ambitious, some of them could make their way into the production model. With AC and DC fast charging facilities, the E-Vision concept is claimed capable of accelerating from zero to 100 kmph in under 7 seconds and has a top speed of 200 kmph.

#### Reference:

<https://auto.economictimes.indiatimes.com/amp/news/industry/etauto-originals-why-wont-india-embrace-electric-vehicles-now/78010131>

**D. Santoshi Bhavana**  
ECE-B 3<sup>rd</sup> Year



## Sneaker Technology

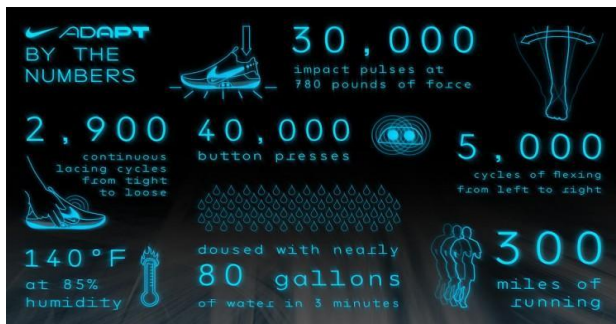
Nike has brought their self-lacing technology to basketball with their new Nike Adapt BB sneaker.

#### The future is back

for the uninitiated, the Nike Adapt BB is one of the most highly coveted and culturally significant sneakers ever to be created. Originally appearing in the Back to the Future franchise, the sneaker, and its technology has become ground zero for a lot of modern sneakers including the new Adapt BB. The shoe embodies both the present and where the athletic company intends to take the sneaker technology, with the aim of going far beyond just the sport of basketball. The ultimate sneaker for the ultimate athlete. The technology in Nike's Adapt BB is more than just a novelty and can help take the basketball game to the future. Nike's Adapt BB Their aim was to design a shoe that is aware of a pro athlete's needs, adjusting itself around the athlete's foot in real time, not just for performance purposes, but for foot health, a major issue among long term athletes.



Tested countless hours, the Nike Adapt BB constantly monitors the user's foot to keep it snug and secure while he/she perform on the court. Manually or on the phone, the Nike Adapt BB can be tightened or loosened around the foot thanks to the power laces. A small engine inside the midsole pulls the laces to tighten the Flyknit and quad-axial mesh upper.



As mentioned before, the shoes can be controlled via a smartphone via its FitAdapt technology. You can even use the phone to control the bright lights on the bottom of the shoe for a little flare. The Adapt BB shoes can even be wirelessly charged, with a battery that is expected to last 10\_14 days.

**Reference:**  
[technologies.com](http://technologies.com)

**G. Madhuri**  
**CSE-A 3<sup>rd</sup> Year**



## URGOnight

Poor quality sleep has become a common problem for a majority of people around the world. Lack of proper sleep makes you prone to serious medical conditions, such as obesity, heart disease, high blood pressure, diabetes and many more. To minimize this problem a new product has come into the market called –

“URGOnight” which aims to retrain your brain, helping you sleep better.



URGOnight is a wearable Electroencephalogram (EEG) headband and app which is released by URGO Group, a French firm that utilizes neurofeedback therapy to help the user increase the brainwaves that impact sleep. With this in mind, URGOnight can help people fall asleep 40% faster and also cut nighttime interruptions by half.

The headband itself is super lightweight, as it is made from what appears to be a soft-touch silicone material, with a fabric covering on the top of the headband and the sides, where the electrodes are. At night, our brains emit waves that control multiple aspects of sleep, including how fast we fall asleep, progress through various sleep cycles, and how much our sleep is protected from environmental disturbances and sounds. You can improve the frequency of these brainwaves in your unconscious brain by increasing the frequency of sensorimotor rhythm (SMR) brainwaves that are produced during the day when we are awake.



The URGOnight headband can detect the SMR brainwaves that we produce, helping us learn to control SMR specifically, so we get better sleep and fewer disturbances at night.

**“Half a loaf is better than none..”**

**Reference:**

<https://www.imore.com/urgonight-review>

**T. Prathiba**  
**ECE-A 3<sup>rd</sup> Year**



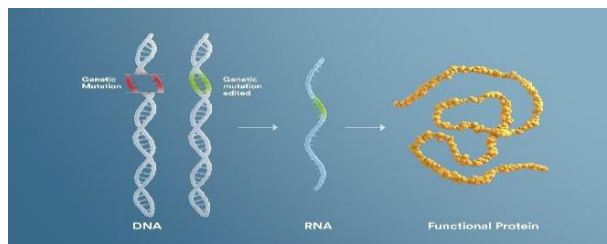
## Diseases will be edited out of our DNA

Gene editing, the ability to make highly specific changes in the DNA sequence of a living organism, essentially customizing its genetic makeup. Gene editing is performed using enzymes, particularly nucleases that have been engineered to target a specific DNA sequence, where they introduce cuts into the DNA strands, enabling the removal of existing DNA and the insertion of replacement DNA. Key among gene-editing technologies is a molecular tool known as CRISPR-Cas9, a powerful technology discovered in 2012 by American scientist Jennifer Doudna, French scientist Emmanuelle Charpentier, and colleagues and refined by American scientist Feng Zhang and colleagues. CRISPR-Cas9 functioned with precision, allowing to remove and insert DNA in the desired locations.

CRISPR-Cas9 has been used in a variety of ways. It has been applied to early embryos to create genetically modified organisms, and it has been injected into the bloodstream in laboratory animals to achieve substantial gene editing in subsets of tissues. Approaches based on CRISPR-Cas9 have been used to modify the genomes of crop plants, farm animals, and laboratory model organisms, including mice, rats, and nonhuman primates. By modifying the genomes of bacteriophages (bacteria-killing viruses) with CRISPR-Cas9 technology, scientists have been able to develop methods to destroy antibiotic-resistant bacteria.



CRISPR-Cas9 systems also enabled the creation of animal models for human disease and the removal of HIV from infected cells. In model of human disease, CRISPR-Cas9 was used to successfully correct a genetic error, resulting in the clinical rescue of diseased mice. The birth of the world's first gene-edited babies happened in 2018.



The twin girls whose genomes were tinkered with during IVF procedures had their DNA altered using the gene-editing technology CRISPR, to protect them from HIV. Gene-editing is also being tested as a treatment for inherited blood disease sickle cell anemia, an ongoing trial will collect and edit stem cells from patients' own blood.

**Reference :**

[20 new technology trends we will see in the 2020s - BBC Science Focus Magazine](#)

**Kavya Swamy**  
**EEE 3<sup>rd</sup> Year**





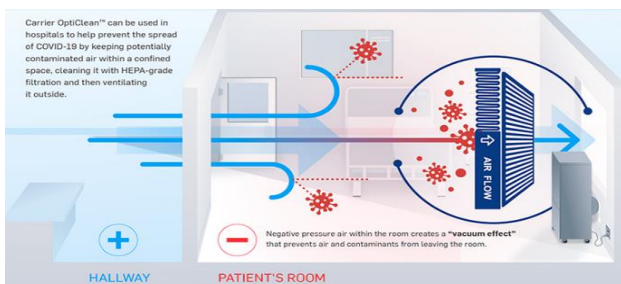
## Carrier Opticlean

The Carrier OptiClean negative air machine is a portable, minimum 500 CFM solution primarily designed to help convert normal hospital rooms into airborne infectious isolation rooms (AIIR). It is designed to comply with ASHRAE's Standard 170 for Ventilation of Health Care Facilities.



Example Room Setup

The Carrier OptiClean uses a 99.97% efficient filter and a heavy duty, yet quiet, motor to remove filtered contaminated air from the room. The resulting negative air pressure, or “vacuum effect,” helps limit the spread of airborne contaminants into surrounding areas. If negative pressure is not required, such as an open-air, temporary hospital, the machine can be used as an air “scrubber,” pulling air in, removing many contaminants, and discharging cleaner air back into the space. This product is a mobile air purifier built by Carrier that has two air-scrubbing functions. It can turn any room into a so-called negative air-pressure space to prevent potentially contaminated air from flowing out, pushing it instead through a high-efficiency HEPA filter before releasing it back into the room.



Or, it can simply filter out pathogens from a room. HEPA filter works by forcing air through a fine mesh that traps harmful particles like pollen, smoke etc. This product is Ideal for a wide range of commercial applications, including K–12 classrooms, dental office exam rooms and open-air, temporary medical facilities etc.

### Reference:

<https://www.carrier.com/commercial/en/in/products/commercial-products/air-side/air-handlers/opticlean/>

**U. Anitha Jyothi**  
**ECE-B 3<sup>rd</sup> Year**



## The Artificial Womb

Every human fetus requires around 37 weeks inside the mother's uterus to fully develop and then comes birth. But not every human has this biological luxury. If the fetus is born before 22 weeks, incubators are not likely to work. The artificial womb is the advanced version of baby incubators and it promises to make the problem of premature births obsolete.

The artificial womb is the artificial uterus where humans could be grown entirely from scratch and designed to help premature babies to continue developing after their birth. This can be done using the device called Growth Pods. Each growth pod is designed to replicate the same conditions that exist inside the mother's uterus. It is the incubation chamber that provides the optimal temperature and humidity for the growth of fetus.





The artificial womb is filled with amniotic fluid, which is the liquid that surrounds the fetus inside the mother's uterus. The growth chamber features advanced sensors coupled with Artificial Intelligence. These sensors monitor the fetus's vital signs which include breathing and heartbeat. The artificial uterus also features a screen which displays real-time data on the development progress of fetus. Inside growth pod, the fetus is kept for 9 months until the full course of development is reached. This entire process of growing babies inside an artificial environment is called ECTOGENESIS. Ecto means outside and Genesis means formation. And babies who are born in such a way are called designer babies or designer humans. To create the perfect baby from scratch you don't need something sophisticated actually, all you need is just a skin cell.

**Reference:** [https://en.wikipedia.org/wiki/Artificial\\_womb](https://en.wikipedia.org/wiki/Artificial_womb)

**P. Sneha**  
CSE-A 3<sup>rd</sup> Year



## Bosch's CubeRover Robots

Bosch, a German multinational engineering and technology company, announced its initiatives to combine artificial intelligence and IoT. At CES 2021 (i.e. Consumer Electronics Show organized by the Consumer Technology Association

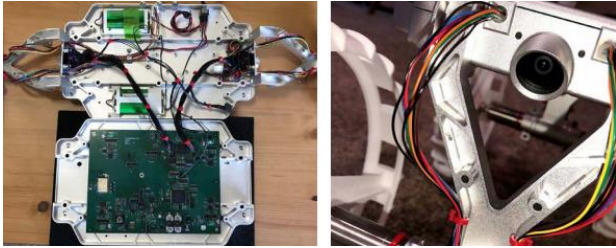
the company unveiled to use AI technology to develop small shoebox-sized robots to operate on the moon as part of NASA's Tipping Point program. Commercial development of small rovers allows engineers, entrepreneurs, and scientists to test novel, exciting, and high-risk concepts on Earth and then on the Moon. Cube Rovers will be the first to demonstrate several capabilities, such as recharging from a centralized power source in a regolith environment, repairing surface assets, and establishing a local communication infrastructure network. In collaboration with Astrobotic, WiBotic and the University of Washington, Bosch announced to develop Cube Rover robots to navigate the moon's surface autonomously. Astrobotic is a lunar logistics company providing end-to-end delivery services for payloads to the Moon.



The project has recently received a US\$45.7 million contract from NASA to design the robots lightweight with ultrafast wireless chargers that could help humans and robots to function on the moon. The Cube Rover enters the Surface Operations phase of the mission. During this phase, the primary objective is the completion of the customer's payload objectives for the mission.

Once on the ground, Cube Rover performs a Mission Wireless Status Check, transitions to standby mode, and awaits commands from the ground to begin payload operation. The Cube Rover remains in standby until commanded to take action: either by driving, imaging, collecting payload data, or performing system maintenance tasks. Customers direct Astrobotic operators to issue commands using the Cube

Rover provided user interface that streams live data and images from the lunar surface for real-time decision making. WiBotic's Role in the mission: WiBotic is working together with the University of Washington, the startup will be developing a "lightweight, ultra-fast proximity charging solution, comprised of a base station and power receiver" specifically for use in space-based applications.



But finding these stations will be its own special challenge — particularly in a lunar context, where things like GPS don't come into play. Instead, Bosch will leverage data collected from sensors on board the robot to generate a sensor-fusion result that can provide it with autonomous navigation capabilities. That work could be instrumental in helping future rovers navigate not only to power stations, but also to various destinations on the lunar surface as robotic science and exploration missions ramp up. The goal is to have a demonstration rover-charging system ready to show off in 2023, and the partners will be working together with NASA's Glenn Research Center to test the technology in the facility's thermal vacuum chamber test lab.

**Reference:**

<https://techcrunch.com/2020/11/17/astrobotic-teams-with-bosch-and-wibotic-to-give-its-moon-rovers-wireless-charging-and-smarts-to-find-power-stations/>  
<https://en.wikipedia.org/wiki/CubeRover>

**P.Shanmukha Sripriya**  
**ECE-B 3<sup>rd</sup> Year**



## Everything-as-a-Service(XaaS)

XaaS is brief for Everything-as-a-Service and some of the time Anything-as-a-Service. It is a cloud computing term for services and applications accessed on-demand over the Internet as opposed to being utilized on-premises.

Main Features:

- 1.High Scalability
- 2.Location Independence
- 3.Device Independence
- 4.Multi-Tenancy Services
- 5.Unlimited Storage

What is as-a-Service?

As-a-service is a specific type of computing that involves IT resources and services that can be accessed without owning the associated physical equipment. These services are delivered at the appropriate scale in a multi-tenant environment on-premise, on-demand, or both. They're of three different types:

1. Software-as-a-Service: This lets businesses access applications running on the service provider's infrastructure through a thin client interface.

Example: Google apps (Drive, Gmail, Docs), Microsoft office 365

2. Platform-as-a-Service: This lets businesses deploy their custom applications into a service provider's infrastructure.

Example: Amazon Web Services(AWS), Heroku

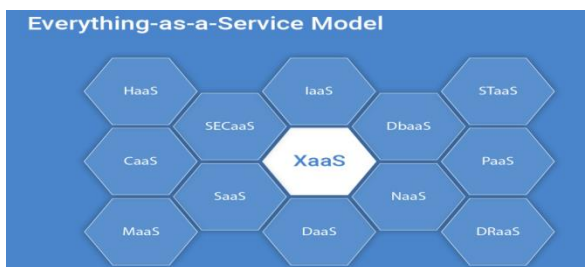
3. Infrastructure-as-a-Service: This lets businesses rent processing, storage, networks, and other fundamental computing resources to deploy and run any software operating systems and applications

Example: Google Compute Engine, Microsoft Azure. There are three different phases in putting XaaS to work:

Phase 1: Businesses virtualize their stand-alone data centers using VMware to improve server utilization.

Phase 2: The companies will begin to use services to bridge an on-premise private cloud and public service provider supported cloud. Applications from the cloud will communicate to form solutions. This is the “Hybrid cloud”.

Phase 3: Multiple private clouds and public clouds spread across multiple service providers, will communicate to provide solutions to this is called the “Intercloud”.



What should a Service provider do to build a XaaS?

Step 1: Start building out the infrastructure that will support the As-a-Service model.

Step 2: Start offering compute capacity to run customer applications on the cloud.

ii. Disaster recovery, to ensure business continuity.

iv. A virtual desktop reducing operating costs and cloud bursting to provide overflow capacity during peak demand.

Step 3: Eventually move on to offering platform-based services.

Advantages of using XaaS:

1. Better Backup and Disaster Recovery Planning: The information is safely backed up to the cloud and can be accessed and restored immediately in case of a fire or any disaster.

2. Enormous Flexibility: Technologies can change in the blink of an eye.

By having the flexibility of a subscription-based pricing model the management can rapidly scale their solutions up or down to adapt to the business needs. XaaS also means the management can pick and choose the right services for them.

3. Accelerate Market Agility: XaaS models make it easy to access new, cutting edge technology as well as deploy it quickly to keep ahead of the competition.

4. Bigger Cost Saving: XaaS is low maintenance, so it will be simple, convenient, and manageable for the user. The service provider will handle the maintenance of the management service.

We are already experiencing: Transportation as a Service: This provides an online account for people to use on every kind of transportation.

Identification as a Service: An online account or platform to keep their identification data and passport for worldwide use.

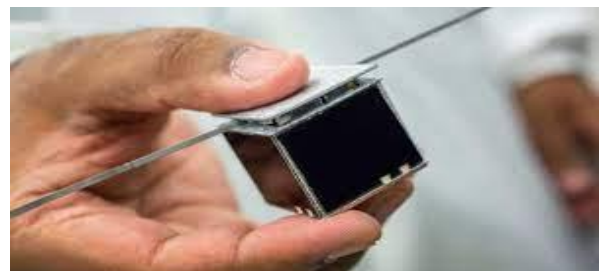
#### Reference:

<https://www.samsolutions.com/blog/everything-as-a-service-xaas-definition-and-examples/>

**Nandula Haripriya**  
CSE-A 3<sup>rd</sup> Year



## FEMTOSATELLITES-A Revolution in space science



The next big thing in space is really, really small.’ The Technology has been improved so far from wired communication to satellite



As on 2019 there are nearly 5000 satellites that are orbiting our planet. When thinking about satellites, the first thing that strikes our mind is the size of a spacecraft. But the revolution of femtosatellites (tiny satellites weighing just 10-100g) change the way we think about satellites. As technology being improved, small spacecrafts became more and more capable of supporting more and more sophisticated instruments. Among the small satellites, femtosatellites (weighing just 10-100g) in particular have gained more attention over the past years. These are generally operated in clusters under the command of a nearby 'mother ship' (which may be another satellite or a dedicated satellite hub). However, recent developments have enabled them to function independently. This new space revolution scintillating on the horizon of the technological revolution in the field of remote sensing and many other applications posed a major significance than the satellites of conventional size (above 500Kg). In recent years, the increase in research related to femtosatellites has increased and it's imperative to note that their actual limits are yet to be exploited.

#### Reference:

<https://www.hindustantimes.com/india-news/100-femto-satellites-designed-by-students-to-be-launched-today-101612674343407.html>

**K. Eunice**  
ECE3<sup>rd</sup> Year



## Copy & Paste

Ever wished to have a smart scanning and printing tool to help you. "Copy & Paste" can be the right answer to your need. The most

interesting thing is, this scanning and printing tool have the ability to transfer the images and text from one source to the other pretty fast.

Not to mention, you can also use it to print directly into your notebook, thereby eliminating the requirement for an additional paper. So, no more expensive printer or heavy photocopier machines!

Copy & Paste is a portable scanning and printing tool with which you can literally perform the said function. You don't need your heavy printer or a photocopier machine.



All you need is this handheld scanner that can transfer the images and text from one source to another source, but in the physical plane. A button on the underside activates the scan function. A button on the top activates the print function.

Copy & Paste can print directly into one's notebook; additional paper is not required. So, there is no problem of electricity, running out of paper etc... which are major issues while using a printer.

**Gudala Aishwarya**  
EEE 3<sup>rd</sup> Year



## Sixth Sense Technology

Sixth Sense is a wearable gestural interface that enhances the physical world around us with digital information and lets us use natural hand gestures to interact with that information. Sixth



sense technology is a perception of augmented reality concept. Like senses enable us to perceive information about the environment in different ways it also aims at perceiving information. Sixth sense is in fact, about comprehending information more than our available senses. And today there is not just this physical world from where we get information but also the digital world which has become a part of our life.



This digital world is now as important to us as this physical world. This sixth sense technology provides us with the freedom of interacting with the digital world with hand gestures.

This technology has a wide application in the field of artificial intelligence. This methodology can aid in synthesis of bots that will be able to interact with humans.

#### **Applications:**

**Capture photos with fingers:** Using the fingers the user can capture photos hence, no need to carry an additional gizmo. The box created by the fingers act as frame for capturing photo.



**Clock:** The user just needs to make gesture of clock and the watch will be projected on the user's hand.

#### **Reference:**

[https://www.engineersgarage.com/article\\_page/sixth-sense-technology/](https://www.engineersgarage.com/article_page/sixth-sense-technology/)

**A.Vaishnavi**  
**ECE-B 2<sup>nd</sup> Year**



## **Eye Tracking Technology**

Eye tracking is a sensor technology that makes it possible for a computer or other device to know where a person is looking. An eye tracker can detect the presence, attention and focus of the user. It allows for unique insights into human behavior and facilitates natural user interfaces in a broad range of devices.

An eye tracker consists of cameras, projectors and algorithms. The projectors create a pattern of near-infrared light on the eyes. The cameras take high-resolution images of the user's eyes and the pattern. Machine learning, image processing and mathematical algorithms are used to determine the eyes position and gaze point.



The key piece of equipment that is needed is an eye tracker, which can be mounted on a computer monitor or laptop, or in some cases, mounted on the user's head. The system uses a light source – typically infrared light for accuracy – which is directed toward the user's eyes. A camera tracks the reflection of light and

the movement of visible features of the eye, such as the pupil. Understanding of eye-tracking data expanded over time. A Russian psychologist named Alfred Lukyanovich Yarbus studied eye movement in the 1950s and 60s, and he determined that there was a connection between a subject's movement and fixations and their interest in the task at hand. When asked specific questions about an image, their gaze would linger on the relevant items within that image. His studies were only the beginning.

Eye tracking truly took off starting in the 1980s as eye trackers became even more accurate and less intrusive. Computers were then powerful enough to handle visual-tracking data in real time, and it became a way to observe users' reactions to content like animated graphics and online advertisements.

**Reference:**

<https://www.tobii.com/group/about/this-is-eyetracking/#:~:text=Eye%20tracking%20is%20a%20sensor,a%20broa%20orange%20of%20devices>

**P.Aditi Kiran**  
IT-B 2<sup>nd</sup> Year



## AI-powered Hearing Aid

Oticon introduced its newest hearing aid device, Oticon More, the first hearing aid with an on-board deep neural network. Oticon More was trained using 12 million plus real-life sounds, so that people wearing it can better understand speech and the sounds around them. Oticon More hearing aids, are rechargeable. In a complicated "sound scene"—picture a bustling airport or hospital emergency room—the Oticon

More's neural net receives a complicated layer of sounds, known as input.



The DNN gets to work, first scanning and extracting simple sound elements and patterns from the input. It builds these elements together to recognize and make sense of what's happening. Lastly, the hearing aids then make a decision on how to balance the sound scene, making sure the output is clean and ideally balanced to the person's unique type of hearing loss. This system is able to find speech even when it is embedded in background noise. Unlike traditional sound algorithms, it provides a natural palette of sounds to the users, based on extensive experiential learning. The device delivers a full and precisely balanced sound landscape for optimal human perception. It further enables the users to understand speech, with less effort and remember more.

**Reference:**

<https://analyticsindiamag.com/8-ai-innovations-showcased-at-ces-2021/>

**K.Namratha**  
ECE-A 3<sup>rd</sup> Year



## Rollable Chess Computer with AI Opponent

Chessboard makers, Square Off, introduced the world's first roll able chess computer with an in-built AI opponent. The company has also launched two new chess boards, namely the Square off Neo and Square off Swap. While Neo is affordable, lighter and faster. The company uses telerobotics to manufacture the automated chess boards where players can either play against human opponents worldwide or an AI opponent.



Both the innovative chess boards from Square Off sport self-moving pieces that follow programmed instructions. It is the first-ever automated multi-board game that helps users play numerous games on the same platform. In Square Off's AI-backed set up, a physical chessboard that is connected to its app helps players to connect with anyone across the world. It is not necessary for your opponents to have the Square Off chessboard. All they need is the app on their Android or IOS platforms.

The robot which is fitted with an electromagnet and placed under the board attracts the pieces that are also fitted with electromagnets. When one moves the pieces on the app, one's smartphone transmits the signal to the robotic arm through Bluetooth. The arm - fixed under the board - duly moves along, navigating the respective piece through the board. In short, whatever the opponent moves on the app will be replicated on the player's board.

It would be a rather “spooky” yet exciting game as one can watch the pieces gliding through the board as if steered by “invisible hands”.

### Reference:

<https://www.firstpost.com/tech/news-analysis/ces-2021-square-off-unveils-first-rollable-chess-computer-with-in-built-ai-opponent-9194591.html>

**S.Roshitha**  
**EEE 3<sup>rd</sup> Year**



## Airless Tyres

Bridgestone airless tyre technology features a unique spoke structure designed to support the weight of a vehicle, effectively eliminating the need to periodically refill the tyres with air. Despite this, the demand to keep up with the continuous advancements in the auto industry suggest that airless tyres would be a welcome step forward for consumers as well as the auto industry. Currently, most airless tyres on the market are made from solid rubber or plastic. Golf carts, trailers and lawnmowers are a few examples of these tyres being used in commercial applications.



Glass, rocks, and other sharp objects often appear on the road, and it's not always possible to stay out of harm's way. Drivers also won't



need to worry about carrying a spare tyre in the trunk of their car. About 90% of energy loss from tyre rolling resistance comes from repeated changes in the shape of the tries as they roll. By simplifying the structure of the tyre, Bridgestone was able to minimize the energy loss in these ‘air free concept tyres’. As a result, these tyres have the same level of low rolling resistance as Bridgestone pneumatic fuel efficient Ecopia tyres, contributing to reductions in CO<sub>2</sub> emission.

They are also used on heavy equipment such as backhoes, which are required to operate on sites such as building demolition, where risk of tire punctures is high. The airless concept tyre is one of the initiatives aimed toward Bridgestone’s long-term vision of the use of sustainable materials. The materials used in the tyre are recyclable, contributing to the efficient use of resources. No part of a non-pneumatic tyre ever needs to go in the garbage, which goes hand-in-hand with Bridgestone’s effort to create a “cradle-to-cradle” system in which all tyres are first recycled and then factory-refashioned into new tyres. Airless tyres will be among the first for which this process is a reality.

#### Reference:

[https://en.wikipedia.org/wiki/Airless\\_tire](https://en.wikipedia.org/wiki/Airless_tire)

**D. TulasiPriya**  
CSE-B 3<sup>rd</sup> Year



### Laser scarecrows

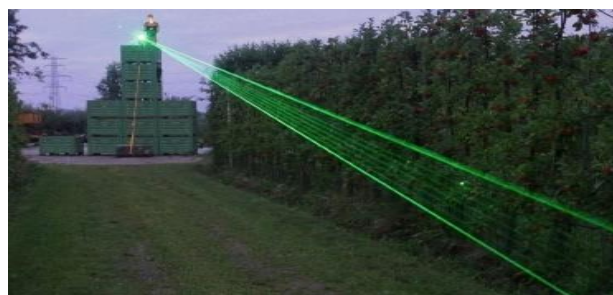
Farmers have had long-running battles trying to keep birds of many varieties from eating their sweetcorn. They’ve used propane cannons, visual deterrents and even shotguns, but none succeed for very long.

University of Rhode Island researcher has created a highly successful technology at scaring birds from cornfields named **LASER SCARECROW**. This laser scare crow has been invented by a URI professor of plant sciences Rebecca Brown.



The laser scarecrow is relatively simple to set up, and the neighbours can’t even notice them because they’re completely silent and the beam isn’t visible to humans in the sunlight.

laser scarecrow is housed in a five-gallon bucket to protect the electronic components from the elements, and it can be raised on a pole to the height of the corn tassels. The green laser light – which is the most effective color because birds are especially sensitive to green lighting – automatically moves back and forth across the tassels in a field as large as 600-feet across, scaring the birds away before they can reach the corn ears.



Laser Scare Crow is a LED-based laser. LED-based lasers have much advantages like less expensive, can run off batteries that are more powerful and less expensive, and can be charged even by using solar panels.



The Laser Scarecrow has been tested for 3 years at the various agricultural fields and found that the Laser Scare Crow was most successful in scaring away the birds in flat fields especially. Laser Scare Crow is being for \$500 for early adopters i.e. to the farmers who are willing to try out the new technology before it has become commercialized.

**Reference:**

<https://www.croptracker.com/blog/10-emerging-innovations-in-agtech.html>

**K.Sai Manasa**  
**ECE-B 3<sup>rd</sup> Year**



## Tesla Battery Technology

Electric vehicles are the future. Everyone is working on electric vehicles. India also need more efficient electric cars.

TESLA is right now the most valuable automaker in the world. In recent times, battery technology is big part of company's brand success, it includes Model S, model 3, model X, and model Y. This company entered into India market this year.

Tesla cars currently come with powerful lithium ion batteries. This battery is from Panasonic. Tesla cars' platform is designed in such a manner that the batteries are placed under the vehicle floor, thereby not only offering a better center of gravity but also saves interior and boot space.

For model 3, supercharger is used. It can be charged upto a maximum of 170kw. This model 3 comes with three options standard plus,

performance, long range AWO. Superplus offers range upto 423 km, performance offers range upto 507km, and long range upto 568km. Model S and model X come with same range of 663 km.



Tesla is expected to begin its operation in India this year. Tesla model 3 will likely be the first car to launch in India.

**Reference:**

[https://en.m.wikipedia.org/wiki/Tesla,\\_Inc](https://en.m.wikipedia.org/wiki/Tesla,_Inc)

**T. Greeshmika**  
**EEE 2<sup>nd</sup> Year**



## Dew Computing

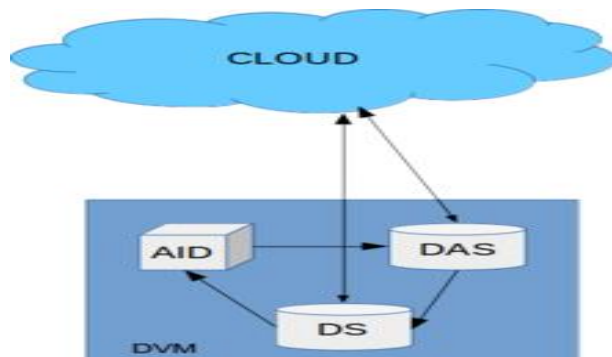
With the rapid progress in cloud computing, a new research area, dew computing, is emerging. Cloud computing brings in many benefits, such as universal access and scalability, but it also introduces a new challenge: all resources are far from user's premises and far from user's control. If an Internet connection is lost, the user will not be able to access the user's own data. Cloud-dew architecture was proposed as a possible solution to this problem.

In this architecture, newly-introduced dew servers make installed websites always available to users and synchronize with cloud servers when possible.

Dew computing is an on-premises computer software-hardware organization paradigm in the cloud computing environment where the on-premises computer provides functionality that is independent of cloud services and is also collaborative with cloud services. The goal of dew computing is to fully realize the potentials of on-premises computers and cloud services.

### Architecture

To establish a cloud-dew architecture on a PC, a dew virtual machine (DVM) is needed. The DVM is an isolated environment for executing the dew server on the local PC, and it consists of at least three components: the dew server (DS), the data analytics server (DAS), and the artificial intelligence of the dew (AID).



- **Dew server (DS):** The DS acts like the cloud service on the local PC. It interacts with and periodically synchronizes content with the cloud service.
- **Dew analytics server (DAS):** The dew analytics server collects data about how the dew server is being used.
- **Artificial intelligence of the dew (AID):** After receiving data from the DAS about usage patterns, the AID uses the data to customize and tailor the dew server to the user to enhance their experience



### Categories of Dew computing:

Category	Resource in Dew	Key Function	Existing Applications
WiD	Web fraction	Access Web fraction without Internet connection	
STiD	Storage	Storage in dew has a cloud copy	Dropbox (2007) [4]
DBiD	Database	Local database has a cloud backup	
SiD	Software	Software ownership and settings have a cloud copy	Apple App Store (2008) [3][9], Google play (2008) [7]
PiD	Platform suite	SDK and projects have a cloud copy	GitHub (2008) [10]
IaD	Whole computer	On-premises computer settings and data have a cloud copy	
DiD	Data in forms other than above	Dew computing applications not in above categories	Novell Groupwise 7 (2005) [12]

### Reference:

<https://core.ac.uk>, [www.wikipedia.com](http://www.wikipedia.com)

**T. Roshini**  
**ECE-B 3<sup>rd</sup> Year**









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