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UNIVERSAL LEARNING

BVRIT HYDERABAD
COLLEGE OF ENGINEERING FOR WOMEN
(Approved by AICTE, New Delhi and Affiliated to JNTU Hyderabad)
ACCREDITED BY NAAC WITH GRADE : A | ACCREDITED BY NBA | NIRF RANKING BAND: 201 - 250

B-SMART

- WE EXPLORE WE EXHIBIT

NAME TO FAME
HACKATHON STORIES
TECHNICAL TRENDS

Volume 7, Issue 1, June 2022
ISBN : 97893-85101 - 70 - 0

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

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

"Have courage, Pursue Your Dreams and make it happen."
Joel Brown

BVRIT HYDERABAD College of Engineering for Women affords the confidence and courage to its students to dream high and pursue them with the right attitude and hard work. And our efforts are yielding results. This year, our students have grabbed such placement opportunities, which remain a dream in many minds during their graduation days!!! I feel honoured and delighted to announce that four of our students got a package of 44 LPA in prestigious companies, and one of the student's packages was raised to 49.25 LPA based on her exceptional performance. On the whole, 2018 batch students outperformed the previous batches, with a total of 926 offers from 74 companies. The transformation the students undergo here has invited the attention of the world around. Career 360 has rated BVRITH with a 4A grade.

Our students' entrepreneurial and innovation skills are a class apart and got recognised on different occasions. They have won a prize of 2 lakhs in Assistive Technology Summit 2.0 at the Telangana State Innovation Cell and financial support of Rs. 2,95,000 from IIC.

Welcome all to the 13th edition of BSMART, the Technical Magazine of BVRITH, to learn more about our students' achievements and read their contributed articles.

Of the students' articles published in the last issue, the article selected to be the best one is AI DRIVEN DYNAMIC FACE MASK, contributed by M. Sreeja of III ECE.

I congratulate the contributors of articles and the faculty and student coordinators who worked sincerely to publish this edition of the magazine.

Stay safe, Stay healthy.

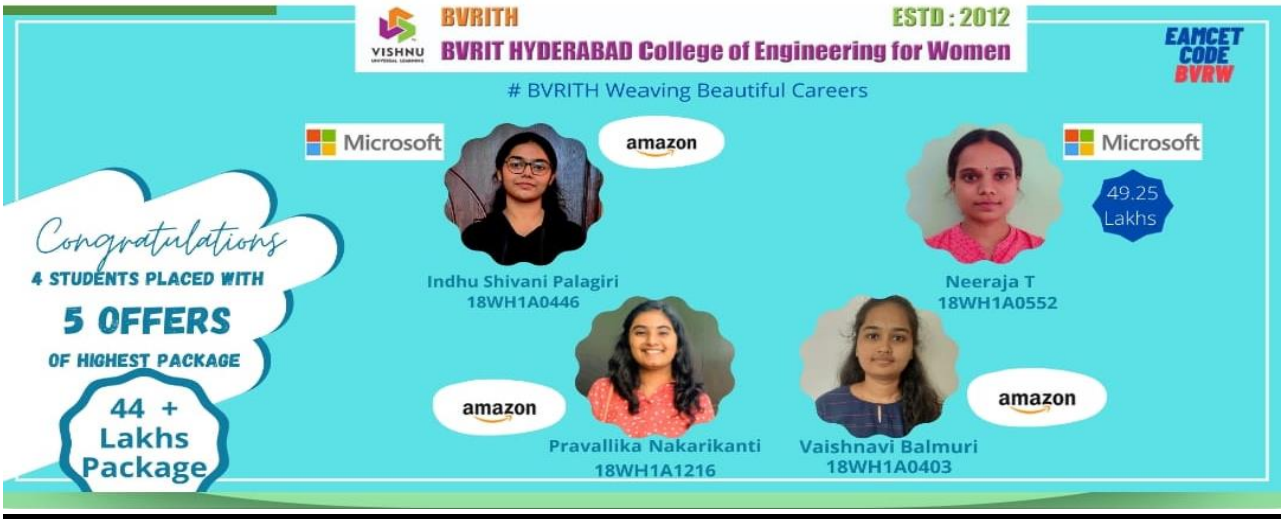
With Best Wishes

Dr. K.V.N. Sunitha

Contents

‘Names to Fame’

BVRIT HYDERABAD proudly introduces its stars of the year and wishes them ‘The Best in Life’



Hai readers, I am Neeraja. T from the Department of Computer Science and Engineering Batch 2018-2022. The global pandemic was tough on everyone's lives. Despite the pandemic, everyone worked so hard to achieve a good result. I take this opportunity to thank our principal mam, college placement coordinators, and the faculty for their constant care and support. I thank them for guiding me and helping me bring out my confidence to land in a prestigious company like Microsoft.

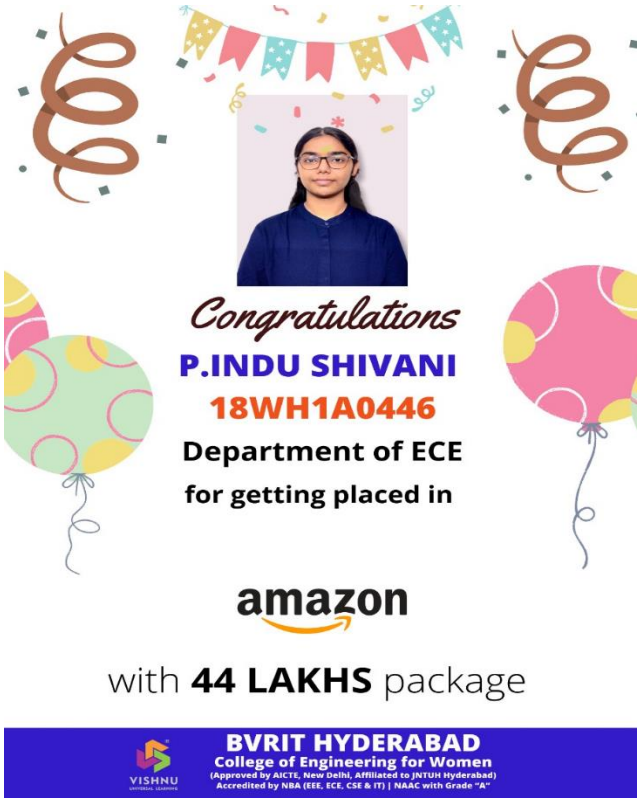
I am an explorer. Everything I see fascinates me. A constant question that I had while growing up was "How?". My constant urge to learn new things made me choose Computer Science. I was an ambivert which made it difficult to communicate with people out of my friends' circle. Stepping out of my comfort zone was a big step for me. But once I understood that nothing grows in the comfort zone, I started working on myself. I began to step out of my

"It's not what you look at that matters, it's what you see."

comfort zone and interact with people. Despite her hectic schedule, our principal mam motivated us to work harder to achieve our dreams. She put her faith in us and wanted to see us excel. Programs like Women in Software Engineering (WISE), Internal technical training, and Smart Interviews (SI) conducted by the college helped us gain technical knowledge. College provided many platforms to practice and improve our coding skills. Even though the training was virtual, the trainers and our placement coordinators made it seem physical. Our principal mam used to connect with us to improve our morale and boost our confidence. I thank our placement team for bringing so many opportunities. I'm so grateful that our college conducted mock interviews that helped me understand the level of my communication skills and technical proficiency. For every mock test we wrote, coordinators gave us suggestions for improving the score. The trainers were available 24/7 and helped solve my doubts. The Smart Interviews and the internal technical training helped me master advanced topics. WISE helped me get hands-on experience with various emerging technologies and communicate in groups. To sum it up, there is no comfort in the change zone and no change in the comfort zone. Success comes with practice, consistency, and time. Always believe in yourself. I thank everyone for believing in me and helping me become successful.

T. Neeraja
IV CSE – A

Ms. INDHU SHIVANI



I am Indhu Shivani Palagiri, student of the department of Electronics and Communication, batch 2018-2022. I'm elated to share that I got selected for the role of software engineer in Microsoft !

Coming to my journey, I got introduced to coding in my first year since then my interest to learn gradually increased...

WISE, ELITE programs were an amazing experience, I had a great learning curve, it gave me an opportunity to work on interesting projects and learn many things. Smart interviews and placement training programs helped in improving problem solving skills and to learn things in detail.

Being a part of these programs gave me an exposure to various technologies in industry, also

played a key role in my journey and drived me towards the goal.

Despite the fact that I'm from a non-CS background, the college and department always encouraged to participate in hackathons, engage in various coding activities.

I thank the college, management and placement team for providing such platforms and wonderful opportunities. My sincere thanks to Asokan, principal mam and all the faculty/mentors for their constant support and guidance.

Indhu Shivani

IV ECE - A

Ms. BALMURI VAISHNAVI

I am Vaishnavi Balmuri from the Department of Electronics and Communication Engineering, batch 2018-2022.I have been placed at Amazon as Software Development Engineer 1. I couldn't even get in to BVRITH due to my Eamcet Rank. But my family took a decision to go through management quota and get me into BVRITH college. Now I feel like it's one of the best decisions taken by them. Being an ECE student I wasn't always sure about pursuing coding as Career. In the very first year of my B. Tech, I was introduced to coding through WISE Program. I was not able to code properly and I thought coding is not for me and I left WISE Program during my second year to concentrate more on my academics to get placed in a core company. Our faculty has always encouraged every student irrespective of their branch to practice coding. During second year second semester we were given time to practice coding during college hours and I started coding. I am a hostler and my roommate is a CSE student. I never understood why she used to spend lot of time to practice coding. Only after compiling my first code successfully without errors, I became passionate about it.

In the year 2020 when the pandemic evolved there was plenty of time to practice coding. I started coding every day and then I felt like I can be good at it being a non CSE student. I felt like coding is fun. The smart Interviews training which happened during 3rd year really helped me in further honing my skills and I have got a clear idea about my goal. In the initial stage of placements, I was disheartened as I couldn't even clear the written test of few companies. Finally, after 2 months of hustle I got placed into ACS solutions. This offer gave me a hope to try to realize my dream of getting into a big tech company. Later on, Amazon has come to recruit students for SDE internship during October 2021. I was able to clear the written test. I sat for my first big Tech interview. I was nervous and scared to attend the interview. I was not able to clear the Round1 interview. After this I completely gave up coding. Our faculty always encouraged me told me to achieve something big. One day I noticed Photos of our ECE seniors on the walls of placement cell. I got motivated on that day. From then I started coding again and never looked back. Amazon came to our college again in the year of 2022 for Full time SDE role. I cleared the test and I was qualified for interviews. Soon after we cleared the Amazon test Our principal mam spent her valuable time in motivating us and encouraged us to give our best in the interviews.

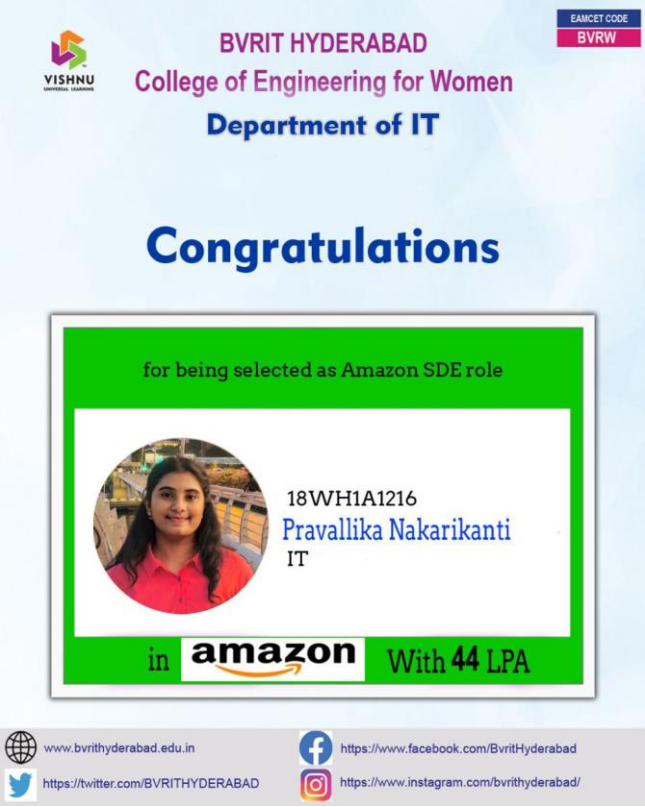
I am also delighted to share that I got rejected from numerous companies and received offers from few. I am happy that I got rejected, each and every rejection taught me something and if it weren't for those rejections, I would never have gotten those offers. Everyone in our college is very supportive from the beginning asking me in every step of the way if I needed any help. I am thankful to all placement team, friends and family for their guidance throughout my journey. Without their hard work my journey wouldn't be a fruitful one.

Vaishnavi B

IV ECE - A

Ms. PRAVALLIKA NAKARIKANTI

I am Pravallika Nakarikanti, a student from the IT class of 2022 at BVRIT HYDERABAD College of Engineering for Women. From a confused teenager back in 2018 to a lucid-minded senior student in 2022, I have come a long way in the past 4 years of my college life. Like many other students, I too joined my college with a disappointment that I was not able to crack the premier institutions in India. My B. Tech experience made me realize that it's not your college name that matters its rather the culture and your takeaways from college which do.



The programs and training in our college built a healthy learning culture for us which helped me develop skills in many different areas. Right in my first year, I was introduced to coding through a program called WISE, through this program I developed an interest in programming languages, web development, and data science. Even after that, I was still confused - there were too many career paths in front of me - Job, MS, Internship, Research, etc. and I had developed a FOMO about picking one of them. At that point, all that I was clear about was - I loved discussing problems with my friends and I would be thrilled if I was able to solve them through code - that's all. Then came WISE-ELITE, after putting in consistent efforts in WISE during my first year, I got an opportunity to become a part of this group in my second year, and I learned a new programming language named Haskell in ELITE. I have many important learnings from this program, self-learning, making professional presentations, clean coding practices, and communicating my code in layman's terms were my key takeaways. The faculty and my department would support me whenever needed and explain the concepts that I missed out in class whenever I attended Elite classes. This is where my journey of exploring the tech field started. I tried my best to participate in hackathons, attend workshops and build projects which not only helped me pick my career path, but they also helped me build a strong profile for placements. I then went on to become a GHC Student Scholar. It gave me exposure to technical events and diversity inclusion initiatives across major tech companies all over the world. But, when internship drives started on campus, reality hit me hard, I was rejected by many companies during that drive. It felt like the things I learned till then were not enough. So, it was high time for me to think about what I can do to crack that dream job of mine. I realized that I had to learn competitive coding. Our college already started SMART INTERVIEWS Coding Training for placements by then. I was still confused about whether coding was my thing or not. But, getting an internship was my priority, so I decided to focus on that first. I brushed up on my basic technical concepts like OOPS, OS, Web Development, and DBMS. Then, I cracked a Data Science internship at Maersk. I learned a lot from

"Your problem isn't the problem. Your reaction is the problem."

my internship. But it was not over yet, I wanted someone to guide me and tell me that - "this is where you have to start" and "these are the problems you need to do to crack FAANG jobs". But things are never that easy right? I would spend hours surfing the internet to decide where to start, I would visit many programming platforms every day but wouldn't solve at least one problem from them. I wasted almost 2 months doing this. Then one day it suddenly struck me that - isn't this what ELITE taught me? Self-Learning. I spoke to seniors who cracked good packages and decided to practice on LeetCode. Since then, I would try to solve at least one problem a day. I tried my best to solve as many problems as I can. I would simultaneously balance my internship and academics as well. I was rejected by so many companies throughout the process. Those rejections would leave me confused, but our principal ma'am and my parents would constantly encourage me to practice more and never lose hope. I then cleared coding rounds of Microsoft, Walmart, and Amazon, interviewed for all of them, and finally cracked an FTE at Amazon. I am on cloud nine now!

In my past 3 years of college life, I have been through a lot, I juggled so many things. My experiences from the projects that I worked on, the programs that I have taken part in, and the people that I have met, helped me make decisions in my career, realize my dreams, and motivated me to aim higher. They answered many questions for me, like - Job first or Masters? Software Engineering or Data Engineering? Role or Company? and many more. I would like to thank our principal ma'am, WISE Elite mentors, IT Department, BS&H Department, my parents, and friends who have constantly supported and guided me throughout my journey. The fact that I am joining a FAANG company and above all the company being Amazon is very exhilarating to me and I am all pumped up for the next chapter of my life. To all the clueless minds reading this, please remember that - "**Confident walking is more successful than confused running, follow no one but learn from everyone**" and to all my peers, I wish us all the very best for our future!

Pravallika . N

IV IT

COVER STORIES

COVER STORY – 1

ASSISTIVE TECHNOLOGY SUMMIT 2.0 CONDUCTED BY TELANGANA STATE INNOVATION CELL (TSIC)

Title :

INFANT CRY DETECTOR

Team Members:

Ms. Bhuvika

Ms. Nidhi Venugopal Nair

Ms. Kondoju Swathi

Ms. Thota Monisha

(III ECE)

Mentor:

Mr. N. M. Sai Krishna
(Asst.Professor, ECE Dept)

Mr. R. Priyakanth
(Assoc.Professor, ECE Dept)

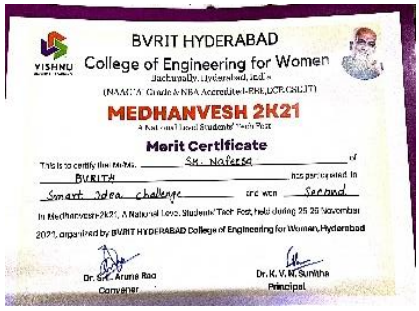
Hi, I am Bhuvika of III ECE along with team , Nidhi Venugopal Nair, Kondoju Swathi ,Thota Monisha have participated in the Assistive Technology Summit 2.0 conducted by Telangana State Innovation Cell (TSIC) on 3rd December 2021 and presented our idea “Infant cry Detector ". Our product is a portable device which is aimed to classify the reason behind an infant's cry. It aims to help all young generation parents, caretakers and people with no medical background. Our motivation to develop this product is the zeal to help the new generation parents and caretakers in understanding the babies better and do the needy as soon as possible. We have encountered many real life situations where it is observed that having a proper understanding about babies needs would have solved the situation better. In the process of developing a prototype for the product we have spoken with a fewnew age parents and caretakers who have given positive feedback regarding the project and the revolution it'll bring in the parents' life. Hence, we are in the process of developing the prototype and are expecting to finish the project at the earliest.

We won first prize in the event and we got to interact with many entrepreneurs and techies. The feedback which we received from the technocrats has helped us a lot in understanding the implementation. The moment we received the prize was not just overwhelming but it has also encouraged us to work more. It gave us a responsibility which we are going to fulfil by doing our best.We were awarded a grant of Rs.2 Lakh to finish our work

“The secret of success is to be ready when your opportunity comes.”

COVER STORY – 2

2nd PRIZE WINNER IN TECHNICAL FEST OF BVRITH MEDHANVESH



Title:

AUTONOMOUS DRONE TECHNOLOGY FOR HUMAN RESCUE OPERATION - BHAROSA

Team Members:

Ms. S.K. Nafeesa

(II EEE)

Protection of Human being is challenging task at every moment till date. Every second counts during the difficult times. The person looks for immediate help and support to address the danger. This needs immediate attention and identification of the location. Majority of the rescue persons cannot reach and attend that tough situation quickly because of many reasons. The challenges can be identification of location, distance, transportation, traffic and other logistics. To address this problem rapidly, our idea is to employ Autonomous drones to rescue the person at risk. Drone automatically actives itself immediately after receiving emergency message from the user at risk, we will develop an app BHAROSA through which the emergency message from the user reaches to the drone and the rescue control room at a time. Where the drone activates and reach to the risk location, this drone can be controlled only by the authorized rescue persons. After reaching to the location all the unique security features of BHAROSA drone gets activated like live telecast of video to the rescuer controller device, voice commands from the rescuers to the person at risk, high siren sound to attain the surrounding peoples' attention etc. All these features are controlled by rescuers' controlled device only. This idea is unique and won prize at our college technical fest Medhanvesh under smart idea Hackathon event and currently working on the prototype which will be the proof of concept. Implementation of this idea will make a huge impact on decreasing the security threats and will strengthen the person at risk. BHAROSA drone will act as a support system to the rescue people to rescue person in danger.

COVER STORY – 3

2nd PRIZE WINNERS OF INNOVATHON (Hackathon) IN MEDANVESH 2k21 A NATIONAL LEVEL STUDENT TECH FEST

Title :

AIR QUALITY MONITORING AND ALERT SYSTEM

Team Members:

Ms. Bh. Sai Sruthi

Ms. P. Sneha

Ms. Ch. Likhitha

Ms. K. Gayatri

(III EEE)

Mentor:

Mrs. B. SUJATHA,

(Assoc. Professor, EEE Dept)

We the EEE students of BVRIT HYDERABAD College of Engineering for Women, participated in Innovathon, as a part of Medhanvesh 2k21.Due to the covid pandemic, everything was online and we were disappointed that we would miss out on the real engineering fun of creating things.We were craving hard for opportunities that give us a real-time experience of problem-solving and developing things, that's when our college announced medanvesh. Our idea was an air quality monitoring and alert system which comes under the theme of Sustainability in Urban areas. Our team brainstormed all the possible features and applications that we could include in our project once we got clarity on the motives we started working on the project from scratch and built a basic model of air quality monitoring and alert system using necessary microcontrollers and sensors. Working of our device is like it senses air quality through sensors and displays values on the LCD screen and the data is collected and pushed to IoT Thing speak cloud where we created our channel for displaying AQI data, this works as a monitoring system whereas in case of any abnormalities in air quality or gas leak the buzzer goes high indicating danger this acts as an alert system. All our ideas and models were scrutinized by judges and we are happy to share that our team stood in the second position. This achievement extremely motivated us and made us realize our true potential.

"Two wrongs do not make a right."

COVER STORY – 4

ONE OF THE FINALISTS IN INSTITUTE INNOVATIVE COUNCIL – NATIONAL INNOVATION CONTEST 2020

Title :

FLUIDO CAPTEUR

Team Members:

Ms K Lakshmi Prasuna

Ms D Srijana ,

Ms V V S Vignatha

Ms M Viswaja

Ms M Jhahnavi

Mentors:

Dr. J. Naga Vishnu Vardhan (Professor, ECE Dept)

Mr. R. Priyakanth (Assoc.Professor, ECE Dept)

Mr. N. M. Sai Krishna (Asst.Professor, ECE Dept)

We are final year ECE students. Multi-speciality hospitals are equipped with intravenous infusion pumps. These devices are very costly and cannot be afforded by small nursing homes. Also, administration of these devices needs trained people. Keeping in view the proposed solution is developed to monitor the I.V fluid level easily with a portable device at an affordable price. Our team developed a product called "Fluido Capteur" which stood as one of the finalists in the IIC National Innovation Contest 2020. Our institution is one of the four institutions shortlisted from Telangana and one of the 45 institutions from India selected for grant support of Rs. 2,95,000 with incubation linkage from the Ministry of Education's Innovation Cell, IIC, Government of India. The National Innovation Contest provided a 360-degree cycle of learning and understanding the process of innovation and start-up. We travelled along a path from problem identification and ideation to building a business model and finally entering the phase of enterprise development in a period of one year., the EEE second year students of BVRIT HYDERABAD College of Engineering for women had participated in technical events conducted by Marri Laxman Reddy Institute of Technology and Management Hyderabad, Dundigal in Virtual Mode. We are very grateful to our mentors, who motivated and supported us throughout this journey.

"Don't cry because it's over, smile because it happened"

COVER STORY – 5

SELECTED FOR WE ALPHA PROGRAM CONDUCTED BY WE HUB, GOVERNMENT OF TELANGANA

Title :

ECO WHE'E'LIE

- ride for the nations pride

Team Members:

Ms.Nikitha.Ch

Ms.Akshitha.V

Ms.Srivani.V

Ms.Likhitha.R

Ms.Asritha.A

(III EEE)

Mentor:

Mrs. K. AMRITHA

(Assoc. Professor, EEE Dept)

We, the EEE students of BVRIT Hyderabad College of Engineering for Women, participated in WE ALPHA program conducted by WE HUB, Govt of Telengana.

The objective of the project is to convert a traditional bicycle to an electric bicycle which will help to reduce the pedalling effort. This can be used as an alternative to the motor bike, and thus promoting green energy. This project is a solution for the lifestyle diseases due to the lack of workout.

The project implements a battery and speed monitoring systems. The BMS in the project can effectively manage the Li-ion battery unit in the electric bicycle.

The idea of charging through pedalling is kept forward which helps to reuse the energy spent for pedalling. The battery parameters can be displayed through a mobile app to the user, and thus remote monitoring of data is possible. The battery can also be recharged through solar panels.

"Key to success is action, and the essential in action is perseverance."

COVER STORY – 6

1st PRIZE WINNER IN TECHNICAL FEST OF BVRITH MEDHANVESH FOR SMART IDEA CHALLENGE

Title:

ANTI BIKE THEFT SYSTEM.

Team Members:

Ms.MEGHANA SRI SAI.A

(III ECE-A)

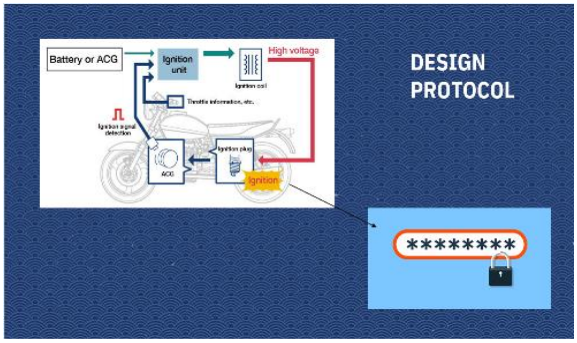
Generally, we safeguard our data in our phone by setting a password or a pattern, for houses and cars we have central locking systems. But we have not thought about our 2 wheelers.

When it comes to the statistics since 2018 there are almost 23,48,841 2-wheeler thefts, keeping this in mind, Me being an electronics and communication student thought of solving this problem by ANTI BIKE THEFT SYSTEM.

So, when we attach this bike security system to our bikes, the user priorly will set up a high strong password which when the right password is entered then only the ignition starts. Now considering the constraint say if the thief tries the password, of course he wouldn't get in the first shot, he would try many times then the owner through the Rf sender will receive an alarm.

And if the user doesn't arrive with in a limit, then the system sounds a buzzer to alert the passers-by. Finally, the alarm stops as soon as the owner enters the right password.

I pitched this idea in the MEDHANVESH 2K21 (a national student s' tech fest) organized by our college. I stood first among 23 teams from different colleges.



COVER STORY – 7

1ST PRIZE WINNERS OF TRANSFORMERS 2021 BY TALSCOUTS

Title :

TALScouts – TRANSFORMERS 2021 UPBHOG

Team Members:

Ms. Grahya Yalavarthy

Ms. Amulya Kasu

Ms. Shravani Mathukumalli

Ms. Harshitha Done

Mentor:

Mr. N. M. Sai Krishna (Asst.Professor, ECE Dept)

Mr. R. Priyakanth (Assoc.Professor, ECE Dept)

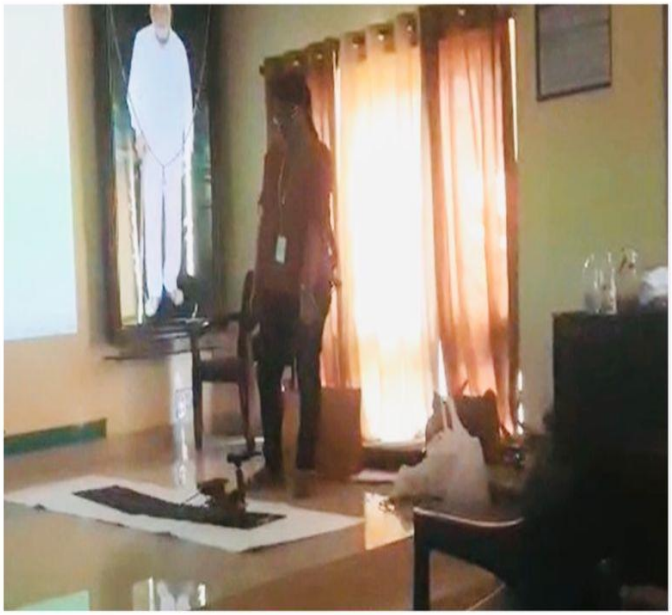
Finding jobs without the involvement of middlemen has been a key concern for unskilled and unorganized workers.
The workers have always been exploited by the middlemen.
On a day-to-day basis there comes a clear requirement of unskilled workers for doing chores or unskilled work in a company/organization/firm. They approach contractors or middlemen to find unskilled workers for their work requirements. These middlemen act as a barrier between the organization which is providing work and unskilled workers.
This leads to a communication gap and no actual contract or bond is given to the worker concerning his nature of work and payment.
We are a team of four- Grahya Yalavarthy, Amulya Kasu, Shravani Mathukumalli, Harshitha Done.
UPBHOG is our idea to an ideal work situation with no discrimination for the type of work that an individual does. Our goal is to eliminate middlemen by directly linking seekers with hirers through a portal. One can use the portal as a job seeker or recruiter.
UPBHOG will be working on partnerships and tie-ups with organizations and running through the requirement of work and connecting them to unskilled ecosystems. To achieve this we aim at working with organizations that help and increase awareness among the community and industrial sector to promote the dignity of work. social media and other platforms will be used to raise awareness.
There will be a very minimum scope of exploitation of work/payment from unskilled workers.

Our Faculty Members Mr.N.M.Sai Krishna, and Mr.R.Priyakanth helped us in figuring out the working of our idea. We wouldn't have won Transformers 2021 by TALSCOUTS without their guidance.

"What seems to us as bitter trials are often blessings in disguise."


GPS Map Camera
Hyderabad, Telangana, India
G9GC+G3H, Satyam Valley, Whisper Valley, Hyderabad, Telangana
500090, India
Lat 17.5264°
Long 78.370226°


REVOLUTIONARY DRONES ARE COMING...
WE BELIEVE IN THE FUTURE OF DRONES FOR A CHANGING WORLD




GPS Map Camera
Hyderabad, Telangana, India
G9GC+G3H, Satyam Valley, Whisper Valley, Hyderabad, Telangana
500090, India
Lat 17.526418°
Long 78.370218°
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TECHNICAL TRENDS

AUGMENTED REALITY IN GEOSPATIAL WORLD

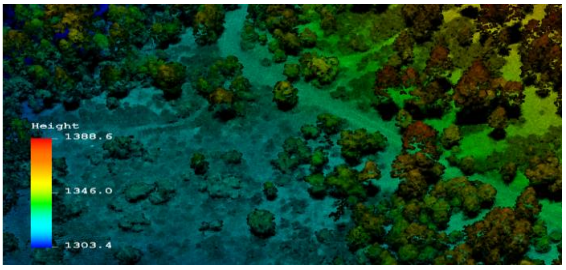
LiDAR or Light Detection and Ranging is an active remote sensing system that can be used to measure vegetation height across wide areas. According to the American Geoscience Institute, LiDAR uses a pulsed laser to calculate an object's variable distances from the earth surface. These light pulses — put together with the information collected by the airborne system — generate accurate 3D information about the earth surface and the target object.

There are three primary components of a LiDAR instrument — the scanner, laser and GPS receiver. Other elements that play a vital role in the data collection and analysis are the photodetector and optics. Most government and private organizations use helicopters, drones and airplanes for acquiring LiDAR data.

Working principle: LiDAR follows a simple principle — throw laser light at an object on the earth surface and calculate the time it takes to return to the LiDAR source. Given the speed at which the light travels (approximately 186,000 miles per second), the process of measuring the exact distance through LiDAR appears to be incredibly fast. However, it's very technical. The formula that analysts use to arrive at the precise distance of the object is as follows:

The distance of the object = (Speed of Light x Time of Flight)/ 2

LiDAR is an **active remote sensing** system. An active system means that the system itself generates energy - in this case, light - to measure things on the ground. In a LiDAR system, light is emitted from a rapidly firing laser. You can imagine light quickly strobing from a laser light source. This light travels to the ground and reflects off of thing like buildings and tree branches. The reflected light energy then returns to the LiDAR sensor where it is recorded.



Forest Geo spatial diagram

A LiDAR system measures the time it takes for emitted light to travel to the ground and back. That time is used to calculate distance traveled. Distance traveled is then converted to elevation. These measurements are made using the key components of a LiDAR system including a GPS that identifies the X, Y, Z location of the light energy and an Internal Measurement Unit (IMU) that provides the orientation of the plane in the sky.

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https://www.geospatialworld.net/blogs/what-is-lidar-technology-and-how-does-it-work/

Ms. M. Shanmuga Sundari, Assistant Professor, Computer Science Engineering

"The successful warrior is the average man, with laser-like focus."

"How the Counting of Calories Evolved into a Scientific Field"

Calorimeters were used to determine both the nutritive content of foods and the amount of steam generated by steam generators.
A new year means a fresh endeavour to pay greater attention to what I eat with the intention of losing weight.

My thoughts have naturally turned to calorie tracking, and I've recently developed a fresh interest in Wilbur O. Atwater. Atwater was the first to introduce the calorie as a measure of energy for food to an American audience. From 1873 to 1907, Atwater was a chemistry professor at Wesleyan University in Connecticut. In the course of time, his interest in nutrition and metabolism grew, particularly when he visited Munich and learned about German methods for measuring the nutritional composition of food. Because he wanted to ensure that employees had a healthy diet, he decided to do research on the relationship between the chemical energy from food and physical labour.
Atwater defined a calorie as the amount of heat that would increase the temperature of one kilogram of water by one-degree centigrade. This was done in order to demonstrate that the force required to raise one tonne by one foot could be represented by the unit of heat energy, and so a Calorie was established as 1.53-foot tons. Atwater included the calorie counts per pound for a variety of meals in his paper, including round, lean beef (807); butter (3,691); ordinary (308), skimmed (176) cows' milk; oatmeal (1,830); and turnips (139). His estimations of the levels of minerals, protein, and fat as well as carbs in each meal, together with the results of various studies, were the basis for his calculations. We still utilize Atwater's estimations for the calorie content of these foods, which are 4.1 Calories per gram of protein and 9.3 Calories per gram of fats. Because of these investigations, our knowledge of metabolic rates has significantly improved.
And this is how we arrived at the practice of calorie counting.

References:

https://spectrum.ieee.org/how-counting-calories-became-a-science

Santhosh Kumar V,
Associate Professor,
Department of ECE

Smart Inverter

Electrical Power System comprises of three components – Generation, Transmission & Distribution. The electrical power transmitted is AC in nature. The power generated in generating stations is fed to the grid, transmitted over long distances and distributed to the consumer premises. The increasing demand for electrical energy and diminishing coal and other conventional resources led to the rise of Non-conventional energy sources like Solar, Wind, Tide etc. Not only new resources came into picture, but the style of generation has also changed. One such style is Distributed Generation (DG). Electrical Energy is generated at the distribution level i.e, close to consumer premises rather than at the very far generating stations. This reduces losses and cost. DG helps

in supporting the power system at times of peak loads.

Solar Power is harnessed by installing Photovoltaic (PV) Cells which convert the solar power into electrical power, which is DC in nature. To feed this power to the grid, the DC power should be converted to AC for which, an Inverter is used. In ref1, solar energy is described as dispatchable (which you cannot dispatch as you wish) and intermittent (which keeps changing with atmospheric conditions). This presents serious power quality problems like change in frequency, voltage, harmonics etc, when being inverted and fed to the grid. The conventional Inverters cannot rectify these problems effectively. Hence the solution would be a **Smart Solar Inverter.**

A conventional Inverter, in case of fluctuations in voltage or frequency, should be disconnected from the Grid to avoid stability problems. If, owing to atmospheric conditions, the fluctuations are frequent, then the connection-disconnection processes of the Inverter lead to severe instability problems in grid, which sometimes might lead to Grid Collapse.

The **Smart Solar Inverter (SSI)** can handle minor fluctuations without being disconnected. It has a robust semiconductor power circuit which is controlled by a software.

The SSI can communicate the changes in frequency or voltage to the installer as well as the consumer. It can also record and share the granular data of the system with the maintenance personnel, which can even help in prediction of the forthcoming power quality issues.

The SSI can also be operated remotely by the operator in case of emergencies. The smart inverter not only converter DC to AC but acts as an additional power source during power outages (ride through feature).

References:

Smart-Solar-Inverters.pdf (cleanenergygrid.org)

Ms. Subhashitha Potharaju
Asst. Prof, EEE

Distributed Computing at Edge

With increasing number of “things” getting connected to the internet, there is an increased necessity of processing the data on the edge in real time and without latency. With edge computing capabilities, systems can perform efficient data processing as large amount of data can be processed at or near the source thereby reducing internet bandwidth usage. Computing data on the edge also eliminates the need for the relaying of information on the public cloud infrastructure thus enabling additional security of sensitive information. In future we would see more companies, both OEMs as well as cloud service providers, joining the bandwagon of providing computing infrastructure on the edge**.**

"Motivation is what gets you started. Habit is what keeps you going."

Introduction:

Edge computing is a distributed open IT architecture that enables systems to compute data near or at the source of information rather than relaying the information to the cloud. Edge computing enables real time data processing without latency. The convergence of the digital world with the people and things via a communication network is described as edge. With edge computing capabilities, systems can perform efficient data processing as large amount of data can be processed at or near the source thereby reducing internet bandwidth usage. Even though edge computing market is still nascent, the concept has existed for some time.

As per IDC, **"Edge computing is a mesh network of micro data centers that process or store critical data locally and push all received data to a central data center or cloud storage repository, in a footprint of less than 100 square feet"**

Structure of Edge Computing

Benefits of Edge Computing:

Even though the industrial adoption of edge computing is still nascent, there are some apparent benefits of edge computing like:

• Data processing at the source: Data which are time sensitive can be directly processed at the source rather than transmitting it to cloud.

- Lower traffic congestion: With edge computing capabilities, systems can perform efficient data processing as large amount of data can be processed at or near the source thereby reducing internet bandwidth usage.Reducing network connectivity dependencies: Many enterprise assets are located at remote location where network connectivity is a serious challenge. With edge computing, systems can operate at remote location with intermittent internet and network connectivity.
- Improved data security: Eliminating the need of relaying all the information to public cloud enables an additional security of sensitive information.
- Lower latency: With data processing and analysis taking place at the edge, industrial applications would be able to perform at a faster speed and with better efficiency.

Conclusion:

With increased adoption levels of IoT and reduction in prices, it opens up business opportunities for not only in the IoT space but also in the edge computing area. There would be newer business models evolving along the lines of providing edge intelligence platform services along with building computing networks closer to the source of data. Investments in these areas both in terms of money and human resources would enable organizations to stay ahead of the evolution and reap rewards.

References:

1. https://www.networkworld.com/article/3224893/what-is-edge-computing-and-how-it-s-changing-the-network.html
2. https://www.astound.com/business/enterprise-insights/edge-computing-vs-cloud-computing/#:~:text=The%20main%20benefits%20of%20edge,Reliable%2C%20uninterrupted%20connection

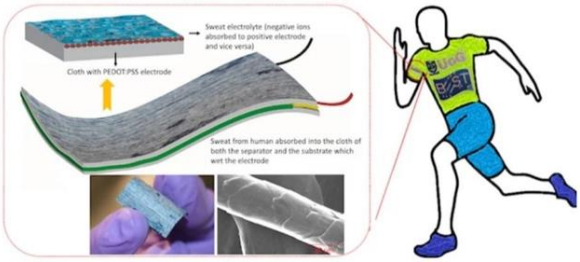
P Krishna Kishore,
Assistant Professor,
Information Technology.

"There are no mistakes, only opportunities."

Sweat Powered Smart Watches

Smart watches are used widely now-a-days. Here is an extension to this. The experts at Singapore's Nanyang Technological University designed the sweat powered smartwatches.

Scientists developed a small battery of size 0.8 square inches (as flat as a bandage) which just requires 2ml of perspiration to discharge 20hrs of battery life. The battery will appear on a band of special textile. This can be worn around the wrist or arm or it can also be attached to smartwatches and can be charged by absorbing the sweat. The potential of the device was first by spraying the artificial human sweat which generated voltage of 3.57V. Later, the first model produced 4.2V when worn by a person riding an exercise bicycle.



The textile material has the capability of retaining the sweat to maintain the constant supply for the battery even when the perspiration rate varies. This device could be more durable than the current technology as it could withstand strain from a wearer's daily activities and repeated exposure to stress or sweat.

Advantages

- Unlike conventional batteries, it contains no toxic chemicals or heavy metals
- These are environmentally friendly.
- This has the advantage over the thinner batteries as they reduce the item's ability to carry enough charge to last throughout the day.

Disadvantages

- The rate at which human skin sweats varies depending on bodily location and environmental conditions and also on the time of day.

Reference:

https://www.dailymail.co.uk/sciencetech/article-9897351/Tech-Tiny-battery-runs-SWEAT-power-smartwatches-wearables.html

M. Lekhya Sri
CSE-B, 3rd year

Vision Made Audible (OrCam MyEye 2.0)

The Artificial Intelligence is one of the booming technology now-a-days. OrCam MyEye is an AI based device which provides text to speech visual assistance for those who are blind, partially sighted or suffering from dyslexia disabilities. This device fits perfectly to the frame of any glasses or sunglasses. It identifies text, money, colors, barcodes, warning signs, instructions on packets of any item and speaks the words to the person wearing it. This device makes the life more comfortable for especially the people who are visually impaired.

It even works with the computer screens as well. It basically works with the gestures. If we want to read the text we can just point to it and then it reads the whole text from left to right and top to bottom. We can stop the reading process by covering the entire text. It identifies the age and gender of a person also. Even we can identify

the currency notes, name of the streets, colors and so on accurately with this device.

Reference:
https://time.com/collection/best-inventions-2019/5733047/orcam-myeye-2/

Kasula Spandana
CSE(AI&ML), 2nd year

Health Tracking Smart Bulb

You may be familiar with smart rings and watches telling you whether you're getting any deep sleep. Soon, that expertise could extend to a light bulb near you. The new smart bulb by Sengled comes with innovative health monitoring technology that can track users vital signs and then deliver that information to their smartphones. It is a dual Wi-Fi / Bluetooth bulb with built-in health monitoring using radar technology. It is designed to track several vital signs including sleep quality, heart rate, and body temperature. This bulb uses a sophisticated Frequency-Modulated Continuous Wave (FMCW) radar to map the room and detect its occupants. FMCW is a low-cost, low-powered radar system operating in the 2.4 GHz range, which has already proven effective in movement, velocity, and range detection.

In addition, you can install and pair multiple such bulbs to form a virtual map that can detect "human behavior." It could even determine if someone has fallen within the room and the bulbs can automatically call for help. The information is delivered to the Sengled app, which can reach out to one of your contacts for help. This smart light bulb will be available for purchase in the fourth quarter of this year.

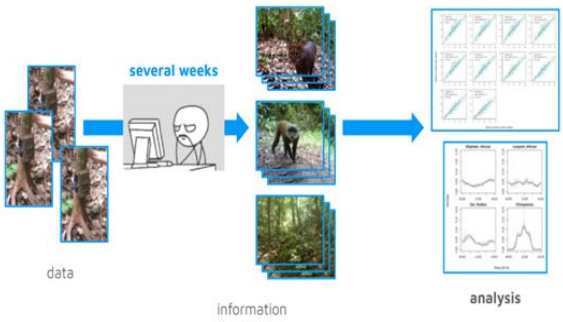
Reference:
https://findbiometrics.com/sengled-unveils-smart-light-bulb-with-health-tracking-capabilities-010603/

K. Renu Sreeja
IT, 2nd year

AI-powered camera traps could protect Gabon wildlife from poachers

AI-powered camera traps give Gabon wildlife rangers a new tool in the fight against poaching and biodiversity loss. With around 24 million hectares of forest, Gabon is a biodiversity hotspot, including hosting one of the largest populations of the critically endangered African forest elephant (*Loxodonta cyclotis*). Now, researchers from the University of Stirling, UK, are using a new kind of camera trap to help monitor and protect this and other species.

Traditional monitoring systems use cameras deployed in the field, but the results are often collected and analysed months later. This delay often means threats aren't detected until it is too late. Whytock and his team trained AI-powered cameras to detect various species and send live data to the cloud, giving rangers a real-time understanding of where the animals are.



Another potential use for the camera traps is to detect poachers. The team has been training the algorithm to detect a human holding a gun. This, combined with real-time data could assist park rangers in anti-poaching activities. "[Gabon] is a really striking place and it's a really important place for the future protection of biodiversity in central Africa," says Whytock.

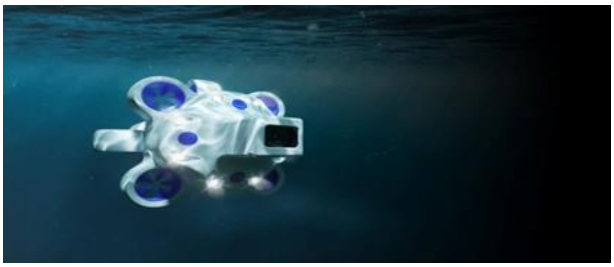
Reference:
www.newscientist.com

Jyotsna Gorak
CSE – B, 2rd Year

Hydrus

Drones, also called unmanned aerial vehicles (UAVs), have no human pilot onboard, and instead are either controlled by a person on the ground or autonomously via a computer program. These stealth craft are becoming increasingly popular, not just for war and military purposes, but also for everything from wildlife and atmospheric research to disaster relief and sports photography. Drones are becoming the eyes and ears of scientists by surveying the ground for archaeological sites, signs of illegal hunting and crop damage, and even zipping inside hurricanes to study the wild storms.

All these are working in the air but hardly we have seen any drones which works underwater. So an Advanced Navigation Company, an Australian's AI based hardware firm has come up with this new autonomous underwater drone known as Hydrus. We have seen drones being used for agriculture purpose, surveillance, weather monitoring, search and rescue till now. This Autonomous underwater drone Hydrus is used to help researchers and scientists overcoming the problems that are faced underwater.



Generally, the pressure underwater is 300 times compared to the outside environment. There's no internet, Wi-Fi or GPS underwater because radio waves don't work under water. So the only medium of communication is sound. To resolve these problems Hydrus is introduced, though it is very expensive, unreliable and requires more advanced equipment with high end technician to work with it.

Coming to the specialties of the underwater drone; it weighs up to 6kgs with 4k 60fps camera which is fused with AI engine that can analyze the image quality and control the lighting. Its lithium ion battery has a life of four hours underwater. It can record sound too with internal storage of 256 GB. It can travel up 3000 meters deep. It also gives an open platform to the users to include their own software as a payload, offering full access to the camera, sensors, navigation, modems and control. The powerful and open architecture is ideal for machine vision and AI applications.

As per Advanced technology, the autonomous underwater drone can travel up to more than 3000 meters deep in future. This drone is currently catching the eye of the film makers. It's one solution to endless applications.

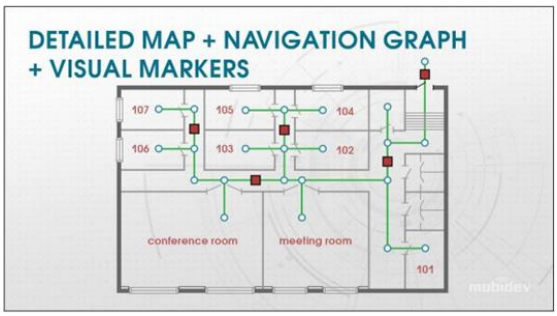
Reference:
https://www.zdnet.com/article/advanced-navigation-announces-hydrus-autonomous-underwater-drone/

Sri Uppalapati
CSE-B, 2nd Year

Indoor Navigation App

Did you ever think that you can have GPS system for your college or office No right! But now we can have. Using this app we can have GPS system for the place you work or the place you live at. For Example you want to go to administration office in JNTU university but you are new to that place then you can use this app and scan the picture assigned to that place(even voice recognition works) and it start to show you the route.

How it works is also simple logic. we will get detail map of the place and set coordinates for rooms, we also give respective names to them. for routing we use virtual markers and give some kind of patterns for some junctions in the route, so when you set your destination it starts to connect the virtual markers related to that destination, With the help of these virtual markers we can avoid obstacles and accuracy is increased.



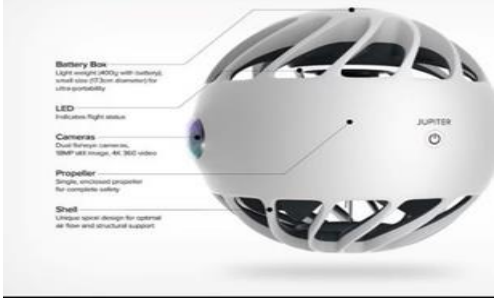
To use this we don't need to carry any AR set all we need is a smart phone. This technology helps people when they are in airports, shopping malls , colleges , offices etc. Advantages of using this technology is it will save our time when we visit a new places. But there are Disadvantages too, doing backend work for every building takes too much time and this is not really useful for the people who know about the place well.

Reference:
https://mobidev.biz/blog/augmented-reality-indoor-navigation-app-developement-arkit

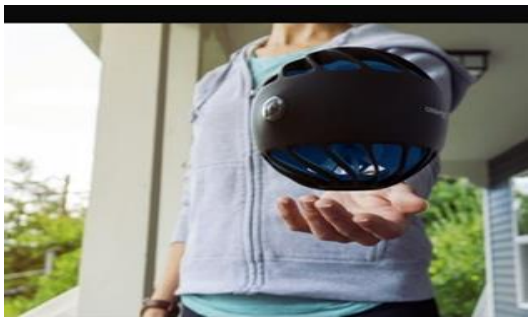
Khyathi Priya
CSE-AI/ML,1st year

JUPITER

Buoyant orbit from science fiction, it is also a one type of drone. Jupiter drone has a intractable orb shape that disregard both the laws of gravity and drone design. Jupiter consisting of a battery box, Led, cameras, shell, propellers.



It is applicable a sizeable single propeller to move in the air, stay upright and even twist and turn while in midair 360 degrees video capture. Jupiter is small, light and portable. But that doesn't mean it sacrifices on features. Big things come in small packages! With two cameras, Jupiter is allowing for a unique visual experience. Vertical sensors allow it to land gently in-hand or on the ground. BATTERY BOX- Light weight, small size for ultra-portability. LED-Indicates flight status, Cameras-Dual fisheye cameras,18MP still image,4K 360 video, PROPELLERS-single, enclosed propeller for complete safety, SHELL-Unique spiral design for optimal air flow and structural support.



Jupiter has four propellers on either corner and a relatively aerodynamic design with legs for taking off and landing. There is a battery mounted on the top, and it has sensors at the bottom that detect proximity allowing it to land perfectly and the outer shell protects the internal propeller so well and it acts as a general shelter as the drone files around filming the view around you.

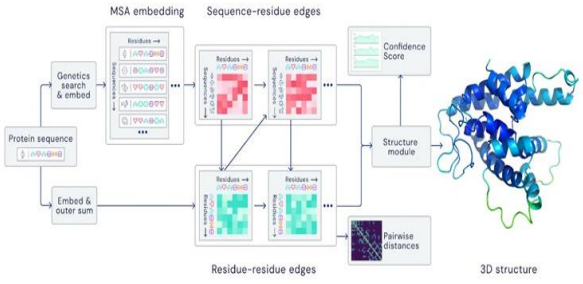
Reference:

https://www.yankodesign.com/2021/08/24/interesting-drone-concept-with-360-cameras-looks-like-a-magical-floating-orb-from-a-sci-fi-movie/

Thummalakunta Amulya
IT-A, 2nd year

Artificial Intelligence for protein folding predictions

Proteins are biomolecules, made up of chains of amino acids, which then fold up into complex knots. A protein's function can be determined by its shape which usually takes months in a lab. Deepmind's AI system AlphaFold 2 uses a machine learning technique called deep learning and can predict the shape of proteins to the nearest atom in no time. First, it takes the input amino acid sequence and checks pre-existing protein sequence databases, and generates a *multiple sequence alignment* (MSA), similar to sequences that have been identified in living organisms. AlphaFold 2 then takes the MSA and the input and extracts information using a neural network-based architecture system and passes it to another system that produces a structure.



The model works iteratively, which means, after generating the structure, it will take all the information and pass it back to the initial block, to refine its predictions. The results that AlphaFold 2 had produced in the 14th Critical

Assessment of Protein Structure Prediction (CASP14) were spectacular, highly accurate, and comparatively much higher than the next accurate team. The software is already being used for cancer research, breast cancer, drug development, etc. As Andrei Lupas quotes, "This will change medicine. It will change research. It will change bioengineering. It will change everything".

Reference:
https://www.deepmind.com/blog/alphafold-a-solution-to-a-50-year-old-grand-challenge-in-biology

Sowmya Mudunuri
ECE-A, 1st year

The M by Portl Model

During the COVID lockdown of the past couple of years, videoconferencing platforms like Zoom, Google meet helped us in overcoming isolation/quarantine. But still, we feel there is something that lacks. What we need is the kind of freestanding holograms like the one in the *Star Wars*. We're not still yet there, but there is something pretty close to it.

It's called 'The M By Portl Model'. This is a mini holographic communication device that doubles as our extraordinary media tool. The device recognizes our voice and gives us instant feedback on whatever we want to get done. This holographic communication medium is built with excellent communication capabilities and will give us ultimate recorded entertainment to enjoy in our free time.

With PORTL's mobile app, we can personalize the network/streaming experience with live or pre-recorded interactive content. The unit's stand accommodates portrait or landscape orientation, there's a high-definition touchscreen display out front, and 16 GB of system memory and 1 TB of storage inside. Also, there is a built-in studio in a box capture ability that allows the projector to transmit seamless images, this means we can beam ourself into a portal anywhere in the world. This is the perfect tool for easy shopping, immersive entertainment, telemedicine appointments, and virtual personal trainer. Portal is available for $2000.

Reference:
https://www.designboom.com/technology/portl-hologram-in-a-box-portal-metaverse-01-28-2022/

Meghana Sri Sai. A
ECE-A,3rd Year

Bionic Eye

This is one of the innovations of Nano Technologies.
The innovation idea to improve vision is BIONIC EYE. As our population ages, impaired vision caused by damaged retina will get increased. So by this technology using quantum

dots can improve vision by stimulating the retina to respond to light. This use of Nanotechnology makes the images brighter by increasing the light received by the retina. The quantum dots fluoresce when hit by photons so the images are more visible to functioning light-sensitive cells. The dots act as semiconductors and are implanted into the retina. They are much smaller than silicon chips. To appreciate the miniature world of nanotechnology, it helps to get an idea of the sizes involved. A nanometer (nm) is the unit of measurement on the nanoscale.

A nanometer is smaller than the wavelength of visible light or a hundred thousand times smaller than the width of a human hair. On the nanoscale, atoms are assembled to make the latest science inventions - such as light amplifying "quantum" dots.
Jeffrey Olsen, of the University of Colorado Hospital, has invented light amplifying

Reference:
https://www.inventor-strategies.com/new-invention-ideas.html

E . Sushmitha
IT-A, 2nd Year

Vertical Farming

Vertical farming is an eco-friendly concept for cultivating food.
It uses green inventions and green technologies related to hydroponics, aeroponics and agua-farming to economically produce food for personal and communal consumption.
As the population of India is increasing day by day this technique helps us a lot. It is estimated that over the next four decades, our population will increase by 3 billion. Currently, the amount of land required to produce food for 6.8 billion people on earth is equivalent to the continent of South America. And in the next four decades, we require an additional 2 billion acres for cultivating food. That much land doesn't exist.
Due to the negligence of people, nature is getting affected because of which we are experiencing extreme weather conditions.
It is predicted that within this century, India will lose 30% of its agricultural production. Then the question arises "where are we going to get food?"

The solution to this is vertical farming. Dickson Despommier, a microbiologist and professor of environmental health sciences at Columbia University credited with popularizing the concept of vertical farming.
The idea originated from an assignment given to feed 2 million people from crops produced on 13 acres of rooftop gardens. using rooftop gardens only 2% of the population could be fed so vertical farming became an alternative solution.

"HAPPINESS is not by chance, but by choice."

Reference:
https://www.inventor-strategies.com/green-inventions.html

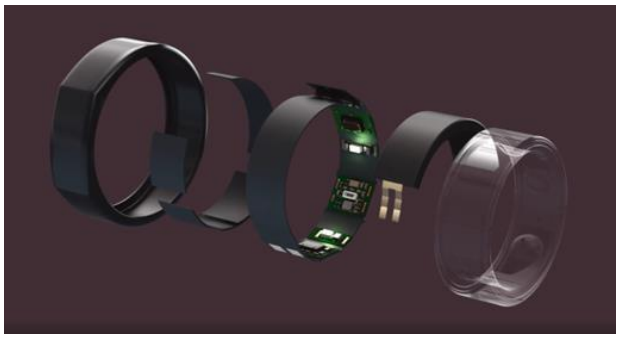
G.Indhu
IT-A,2nd Year

Accurate health information accessible for everyone - Oura Ring

What if a fashionable accessory helps you in tracking your health and can be worn on your finger instead of wrist? It's a ring named "Oura Ring". Oura is a health-based technology company known for the "Oura Ring". A smart ring with 7 sensors, using internet of things technology helps the users track their health metrics. Unlike other trackers Oura not only measures your activity but also generates daily score for activity, readiness and sleep to help the user understand their habits. Oura is a smart device as well as a ring which tracks the user health information and displays the results on smart phone.

Features that make Oura unique from other trackers are:

1). 24/7 heart rate monitoring.
2). 7 temperature sensors
3). Adapts and responds to the user
4). Guided session tracking
5). Sleep Analysis and Prediction



It also helps women in predicting their menstrual cycle based on temperature sensing. Oura records naps and gives credits for the sleep required for us throughout the day. It also detects if the person is tired, unwell etc so that it can automatically adjust the daily goals to help in recovering fast. Interestingly, this ring is available in 4 different colours. It is water-proof, light-weight, non-allergenic and non-metallic. It has a battery life of 4-7 days and to fully charge it takes around 20-80 minutes.

Reference:
https://www.healthline.com/health/fitness/oura-ring#specs-features

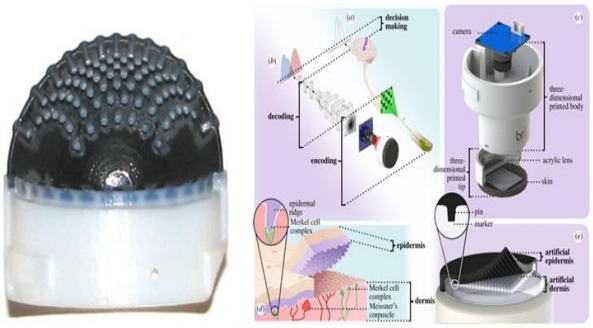
Kummari Tejaswini
IT-B, 3rd Year

Artificial Fingertips with Electronic Neurons

Over the past few decade, we all have seen an immense development in the field of technology and robotics. However, robots still lag behind humans in many aspects like feelings, sensations, etc. Scientists and researchers worked together in these aspects and made it possible for a robot to feel and sense the type of object it is touching.

Researchers at the University of Bristol have designed a 3D printed skin which reacts to texture and shape like our skin does. Their first design was in 2009 in which they used human skin as a guide and the design was almost the size of a soda can. In 2018 , they switched to 3D printing which made it possible to print the tip and the other features of the design. This

module is also referred as Bristol Robotics Laboratory (BRL) TacTip. The bumps just beneath the skin are called papillae and this is where the signals get transmitted. Each papillae has its own nerve endings.



The structure consists of two parts, a rigid structure which consists of all the electronic components and a softy tip which is fabricated (covered) using a multi-material fused deposition modelling printer.
The inside of the tip is filled with silicone gel which provides the required stiffness. The gel is optically clear so that the design can be imaged through an internal camera.A small microphone of diameter 6 mm is fitted in the cavity before filling the gel. This microphone is used to detect the vibrations that are transmitted and sent form the tip. The scientists are trying to make the structure thinner to make it more relatable to the human skin.

Reference:
https://www.electronicsforu.com/news/whats-new/artificial-fingertips-with-electronic-neurons

NSML Keerthi
CSE,1st Year

Bhai Lang- A Toy Programming Language

The first thing that pops into our head when we think of programming languages is that they have a set of rules for everything and it requires dedication to master them, but there are many "joke" languages that have been written with the intent of being ridiculous. "Bhailang" is one them, birthed by two Indian Developers (Bhais) – Aniket Singh from Amazon and Rishabh Tripathi from Groww, in 2022.

Bhailang is based on an inside joke, written in Typescript and employs code from the Hindi local lingo. It has its own syntax and the code starts with "Hi Bhai", ends with "Bye Bhai". If code runs successfully, it gives "Shandaar Bhai" as output or else "Arre Bhai Bhai Bhai" prompts. Variables are declared using "bhai ye hai". It also supports conditionals using "agar bhai", "nahi to bhai", "warna bhai" and loops using "jab tak bhai", "bas kar bhai" and "agla dekh bhai".
Toy language was primarily created as a means of programming language research and education and to create a prototype for a new programming language. This language guarantees a laugh, a heart-to-heart conversation with the desi people with its fun lingo and has impressed Twitter.

Reference:
bhailang.js.org

B Sree Durga Alekhya
CSE,2nd Year

Energy Generation From Roads

Upsurge of carbon emissions from transportation sector laying detrimental impact on environment as well as contributing to the escalation of global warming. Its time to adopt appropriate stringent measures to safeguard environment from further consequences of global warming. Energy generated from roads captures unutilized energy from vicinities and converts it into electric power. This electricity can be used to power roads, street lights, vehicles and can even be stored in batteries. And it essentially makes use of existing road network, no new space need to be allotted.

The vibrations produced by vehicles on road can be used to generate electricity through Piezo electric technology. It deals with the generation of electric energy by certain crystals embedded beneath the layer of asphalt by the application of mechanical stress. Factors that rise the efficiency of these roads is conversely proportional to the durability of roads. Roads having fairly large traffic with heavy duty vehicles moving with high speeds produce more electricity compared to roads with minimal traffic, light weight vehicles, moving with slow speeds.

Energy harvesting technologies are still in inception phase owing to the inadequacy of public data, immoderate costs resulted from the dearth of production.

Reference:

https://etech.iec.ch

M.Sai Nikhitha
CSE-C

Body Scan

Withings Body Scan features six-lead EKG readings, segmented body composition measurements, and the ability to assess foot nerve activity. This body scan helps the people to know how the fat is distributed through their body and how it may treat their heart health. Body scan is a device which looks like a typical scale with a retractable handle up at the top of it. Body Scan contains four weight sensors and 18 ITO electrodes, 14 in scale and 4 in the handle. The scale contains a 3.2-inch LCD colour screen, as well as a battery life of one year. It'll integrate with few devices like Withings smartwatches, Apple HealthKit and Google Fit APIs.

These scales measure body composition through bioelectrical impedance analysis (BIA). The scale sends a low-level electrical current through the users body. Body fat, water, and lean mass have different resistance levels, depending on the rate at which the current travels, the scale will estimate the users body composition. Most of the scales have only 2 points of contact: User's feet, which only estimates the lower body. Withings Body scan uses multi-frequency BIA as the handle provide two more points of contact, hence segmented body composition measurements are obtained. The scale breaks down body composition into whole-body fat and water percentages, visceral fat, muscle and bone mass, and extracellular and intracellular water.

Aside from body composition, Body Scan will provide heart rate, EKG recordings, and vascular age data at each weigh-in. The EKG readings can be saved and shared to doctors. Vascular age feature shows people how is their cardiovascular health compared to other people within their age group.

Reference:
https://www.coachmag.co.uk/gear/9187/withings-body-scan-smart-scale

M. Vasavi Chowdary
EEE , 3rd year

The Washing Machine in a Size of a Smartphone

Dolfi , world's smallest washing machine that cleans your clothes with the power of Ultrasonic technology. It is just as the size of smartphone, pocketly portable. Using advanced Ultrasonic cleaning technology dolfi carefully cleans the most delicate fabric without damaging. No rubbing ,whirling, stretching or fading of colour happens. The fabrics are thoroughly and carefully cleaned from the inside of fabric fibres by the power of Ultrasound. This process efficiently removes dirt and odour.
How does it work?
Put the clothes in any single water proof container, add water and detergent and put Dolfi inside , then switch the device on. We see a glowing blue as it softly cleans the clothes and after about 30minutes , the clothes are clean and fresh. Dofi innovative technology has developed by the MPI Ultrasonics in Switzerland.
The heart of the device is a powerful transducer which creates precisely modulated sound waves

travel through water and for microscopic high pressure bubbles. This process is called Cavitation. The tiny bubbles that implode creating millions of microgeneric wind streams. Those invisible, but powerful streams wash away all the dirt on the fabric.

Reference:
https://beebom.com/cool-awesome-inventions/

B.SOWMYA
IT- B, 2nd Year

3D Printing

We can now make things with 3D printing that we would never have dreamed of a decade ago. In 2022, we'll see transformations in manufacturing and beyond, from 3D printing technological innovations, including mass-produced customized pieces, concrete for houses, printed food, metal, and composite materials.

Even though 3D printing got its start in the 1980s when Chuck Hull designed and printed a small cup, it's been in the last few years that the printers became cheaper to produce and therefore used in a variety of amazing ways.

"Believe you can and you're halfway there."

Also known as additive manufacturing, 3D printing is when objects are created when a printer lays down material in successive layers following the design from a digital file. Here are the top 6 most amazing ways 3D printing is now used in practice today.

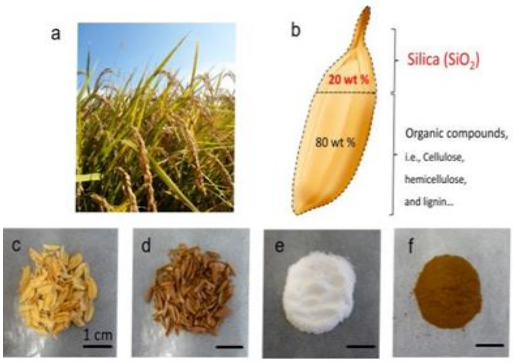
Reference:
https://bernardmarr.com/default.asp?contentID=1554

CH.JAHNAVI
IT, 2nd Year

Eco friendly silicon Quantum Dot LED light by Using discarded rice husks

Every year 100 million tons of rice husk waste is produced by rice mills. Researchers recycle rice husks to create the first silicon Quantum DOT LED light. This new method transforms agricultural waste into cutting-edge light emitting diodes at a low cost and environmentally friendly way.

- QDs involve toxic material, such as cadmium, lead or other heavy metal.
- The environmental concern have been frequently deliberated when using these nanometer.
- The proposed process and fabrication method for QDS minimize these concerns.
- Since porous silicon (Si) was discovered in the 1950s , scientist have explored it's uses in applications in lithium-ion batteries luminescence material, bio medical sensors and drug delivery systems.
  The researchers set out to find a new method for fabricating quantum dots that has a positive environmental impact.
- Waste husk are rich in source of high purity silica (sio2) and valve added Si powder.
- They used a combination of milling heat treatment and etching to process the rice husk silica.
- The rice husk as silica: first they milled rice husks and extracted silica (sio2) Powder by burning off organic compounds of milled rice husks.
- Second , heating the resulting silica powder in an electric furnance to obtain Si powder through a reduction reaction.
- Third, the product was a purified Si powder to 3nm in size through a chemical etching process.
- Finally, it's surface was chemically functionalized for high chemical stability and high dispersivity in solvent ,with 3nm crystalline particles to produce the SIQDS that luminesce in the orange red rang with high luminescence efficiency of 20%.



- The LED were assembled as a series of material layer .an indium-tin-oxide (ITO) glass substrate was the LED anode, additional layer were spin - coated onto the ITO glass , including the layer of SIQDs. The material was capped with an aluminum film cathode.
- The chemical synthesis method the team developed has allowed them to evaluate the optical and optoelectrical properties of the SIQD light - emitting diode, including the structures, synthesis. yield and properties of the Sio2 and Si powder and SiQDs.
- The scientist from the nature science center for basic research and development, Hiroshima University, published their research on January 28 in 2022 in ACS sustainable chemistry and Engineering, the American chemical society journal.
- The scientist next steps include developing higher efficiency luminescence and exploring the possibility of producing LEDs other than the orange red color they have just created.

The scientists suggest that the method they have developed could be applied to other plants. example sugar cane, bamboo, wheat, barley or grasses that contains Sio2.

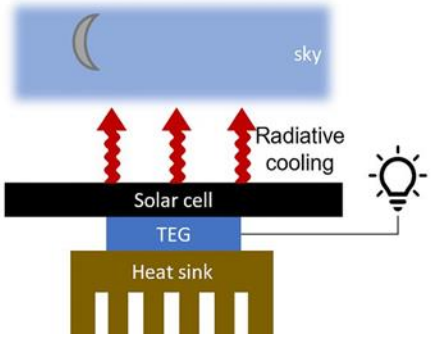
Reference:

https://www. Hiroshima -u.ac.jplen

Ch.Nithisha
CSE-A , 1st year

Generation of power at nighttime using TEG via radiative of Photovoltaic cell.

The idea of producing electricity during night using the thermoelectric generators in solar cells is more fantasizing. The theory behind this idea is interesting too. Rather than having many resources around to produce electricity, a large population of the world lacks access to electricity. And there we go with the idea of producing electricity at night. This is possible with a device that harvests electricity from the temperature difference between the Photovoltaic cell and the ambient surroundings. This device has a thermoelectric generator. A 50 mW per square meter power is generated at night with an open-circuit voltage of 100mV, which means lighting would require about 20 square meters of photovoltaic area.



These TEGs provide additional power with that generated during daytime from the cell. Now this can be used as power generators during daytime and nighttime. Producing power during nights requires additional battery storage installation. From thermodynamics, generation of work from heat requires heat flow from the source to the sink. In this case the solar cell acts as the heat engine using Sun as the source and the ambient surroundings act as the sink, converting solar radiation into electrical energy. Along with solar irradiance, there exists an outgoing radiative heat flow from Earth to outer-space. It is possible because of the Earth's

transparent atmosphere in the mid-infrared wavelength range. This outgoing heat flow helps generate power during nights. The heat flow is used to generate power by the PV cell under the "negative illumination" scheme.
The main aim is to optimize the thermal insulation and thermoelectric components of the device. Engineering improvements are being explored for the solar cell itself to enhance the radiative cooling performance without influencing its solar energy harvesting capability.
Disadvantage: In this process of generating power at night, the thermoelectric generator needs to be in contact with the solar cell, considered as the cold side, and in contact with the ambient surroundings, the hot side. If this is not maintained much power cannot be produced.
Advantage: The whole setup is affordable and, looking into the principle, it could be installed in the existing photovoltaic cell. It is easily installable and can be installed in remote areas with limited resources.

Reference:
https://aip.scitation.org/doi/full/10.1063/5.0085205

V.Indhu
AIML, 1st year

Coelux Skylight

Sunlight, though it is hot now a days, being summer but without which we cannot imagine life. Not just alone, light strengthens, accelerates the process of healing. And exposure to sunlight reduces stress levels and anxiety. But all places in our earth do not get sunlight. In some place it barely appears for few hours and in houses still bad.What if, we had sunlight in your room, anywhere and anytime in a day? CoeLux Artificial skylight makes it possible. CoeLux equally creates an illusion of depth to make the 'sun' – a low-consumption LED light – seem far off in distance ,which manages to cleverly replicate the visual appearance of the sun and sky through a solid layer of nanoparticles that produce Rayleigh scattering.
The effect looks so authentic that CoeLux sky panel has been hailed as being almost indistinguishable from the real sun in the real sky. Installation of a CoeLux system helps treat sufferers of seasonal affective disorder (SAD) and porphyria. CoeLux skylight provides better natural lighting in workplaces and brings warmth in homes.This is available in three editions, each one with a geographical inflection.
CoeLux 60 beams sunlight at 60 degrees to generate "a dramatic slice of tropical light" with the "maximum luminance contrast of light and shadow" as witnessed in the tropics. For a more equal balance of light and shade, CoeLux 45 delivers a 45-degree beam, with a Mediterranean vibe. And CoeLux 30 uses a 30-degree angle beam relative to the horizon to reproduce "a warm, Nordic grazing light" that is more suited to being mounted on the wall than on the ceiling. Just as the invention of the elevator in the 1900s gave rise to the construction of skyscrapers, CoeLux could lead to "earthscrapers" and "iceberg" homes that feature multiple underground levels. A CoeLux skylight unit costs $61,000.

The CoeLux skylight systems can be installed not just in geographical areas where sunlight is

scarce but also in domestic basement areas, airports, offices, gyms, museums and lower decks on yachts. After all, it does not do good without the sun to make your day (and mood:) bright!

Reference:
https://www.coelux.com/

B. Tarini
ECE-A, 3rd Year

Cloud Computing: The Next Big Thing In Business Operations

What is cloud computing?
Cloud computing is high in demand in the new normal as one of the leading solutions for the on-demand availability of technological resources without having anyone actively managing it. Microsoft defines cloud computing as "the delivery of computing services – including servers, storage, databases, networking, software, analytics, and business intelligence – over the internet."
For business owners, this simply means that all you have to do is pay for the cloud service itself – you can say goodbye to high operating and overhead costs while the overall digital infrastructure functions more efficiently.
Businesses and entrepreneurs have ridden the remote work wave in the past two years of the pandemic, but as restrictions ease and new normal commence, some things still remain – including the drive of many employees to continue working from home.

According to a recent poll by Morning Consult, 55% of remote workers would rather quit their jobs than return to the office. This paves the way for the continuous demands in tech, most especially in business intelligence and cloud tools that could best be utilised in an environment where people are working from anywhere.

Reference :
https://venturebeat.com/2021/03/28/industry-clouds-could-be-the-next-big-thing/

Viharika Chinthapalli
ECE-A, 3rd year

Braingate Technology

BrainGate is a brain implant system developed by the bio-tech company, Cyber kinetics in conjunction with the Department of Neuroscience at Brown University. The development of the braingate system brain-computer interface is to enable those with severe paralysis and other neurological conditions to live more productively and independently.
The computer chip, which is implanted into the brain, monitors brain activity in the patient and converts the intention of the user into computer commands. Currently, the chip uses about 100 hair-thin electrodes that sense the electro-magnetic signature of neurons firing in specific areas of the brain. The activity is translated into electrically charged signals and is then sent and decoded using a program, which can move a robotic arm, a computer cursor, or even a wheelchair.

"Expect nothing. Appreciate everything."

Basically, there are two methods to sense the signals sent by the neurons:

ECoG – Electrocorticography:
This measures the electrical activity of the brain taken from beneath the skull. Here the electrodes are embedded in a thin plastic pad that is placed above the cortex, beneath the duramater.

EEG – Electroencephalography:
A device known as an electroencephalograph is attached to the scalp. The electrodes can read brain signals. However, the skull blocks a lot of the electrical signal, and it distorts what does get through.

Advantages of braingate:

1. The speed, accuracy, and precision are comparable to a non-disabled person there is no training necessary.

2. BrainGate can remain safely implanted in the brain for at least two years.

Reference :
Brain Gate Technology – IJERT

Yadlapalli Pravalika
IT-B, 3rd Year

Robot Cat

After heavy backbreaking work, every person wants a peaceful piece of time. Imagine you have a stressbuster in your house that also plays with your young ones. It brings good vibes to your house. As technology is running as fast as it can, innovations are booming in the world. There is a weird and wonderful robotic cat named "Amangami Ham Ham " by "Yukai Engineering." Amangami is the weirdest product to come out in 2022. Amangami" means "soft biting" and "ham" means bite in Japanese. This cuddly cat is specially designed for nibbling on human fingers.

It is also useful for the people who have the secret desire to get their fingers nibbled. The main purpose of introducing this cute robot is to act as a stress reliever. As the phrase goes on, "Don't judge a book by its cover" this ham also looks small that sits about 8-inches high but works with two dozen algorithms inside it. Whenever a finger is put inside, one out of 24 algorithms gets activated as if the person doesn't feel the difference between a toy and a human. "Most people like nibbling but they also know to keep their children away from it", said Yukai Engineering. As technology is becoming part of our life, we should also accustomed to it.
"Innovation is the outcome of a habit, not a random act"

Reference :
https://www.digitaltrends.com/mobile/amagami-ham-ham-biting-finger-robot-news/?amp

V.Tanusree
IT-A, 2nd Year

Pollen Paper

Pollen-based paper is an innovative, printer-ready paper and eco-friendly alternative to conventional paper. Scientists at Nanyang Technological University have developed a pollen-based "paper" that, after being printed on, can be "erased" and reused multiple times without any damage to the paper.

This printed pollen paper is an eco-friendly alternative to normal conventional paper. Pollen paper could help to reduce carbon emissions and also energy usage. Studies says that, we could print high-resolution color images on this pollen-paper produced from a plant-based material.

This is also a new approach to recycle paper not only by just making paper more sustainable but also by increasing the lifespan. Conventional paper is made of cellulose fibers found in wood, and the papermaking process involves energy-intensive steps that include logging, debarking, and chipping. With the pulp and paper industry accounting for 33 to 40 percent of all industrial wood traded globally, this form of papermaking adds to the global problem of deforestation and rising carbon emissions. Pollen grains, in contrast, are generated regularly and in large amounts as genetic material carriers in plant reproduction. The process of making pollen-based paper is similar to traditional soap making, which is much simpler and less energy-intensive.

To demonstrate the printability of their sunflower pollen paper, the NTU scientists printed a painting from Vincent Van Gogh's Sunflowers series using a laser printer. They found that the paper passed through the printer without any tear or damage. "Un-printing" is a concept that has emerged in recent years as an eco-friendly alternative to conventional methods to remove toner from the used paper before it is recycled. This un-printing involves weakening of the bond between the toner powder and the paper for laser printing.

Reference :

https://www.sciencedaily.com/releases/2022/04/220405092717.htm

Aditi kiran Porika
IT-B, 3rd Year

Wear buds Watch: Smartwatch that houses its earbuds

The Wear buds Watch is a revolutionary device that brings together a game-changing smartwatch, high-quality earbuds, and an advanced health & fitness tracker into one perfect timepiece. The sleek design hides a built-in charging compartment for your earbuds. Together with its various tracking and communication features, Wear buds Watch is stylish enough to make a statement and modern enough to keep up with your lifestyle.

With a large and high-brightness display for enhanced readability and advanced performance features, Wear buds Watch is built to help you keep up on all your goals. Track your activity, listen to music, answer calls, and much more, all from the comfort of your wrist.

"You glow differently when you are actually happy."

In addition to advanced fitness features, a new design, and a built-in magnetic charger station for earbuds, the Wear buds Watch improves on its predecessor with a larger display and advanced health monitoring features, such as a blood oxygen sensor, more accurate heart rate monitor, blood pressure sensor, skin temperature, sleep monitor and sedentary alerts. The earbuds provide a snug and comfortable fit, ensuring the passive noise-cancellation you need for an exceptional soundscape. So, keep on listening to your favorite music without hearing the surrounding noise.

Reference :
https://www.youtube.com/watch?v=oKpqYirbf7U

M. Shruthi Rao
ECE-A, 3rd year

The Movano Ring

I am sure you would have heard of smart wearables like smartwatches, smart glasses, etc. But have you heard of smart rings? If not, let's understand what the new Movano Ring is. The Movano Ring has been designed especially for women of all ages and focuses mainly on keeping track of their daily fitness.

The Movano ring measures the user's heart rate, SpO2, temperature, respiration, blood oxygen, and calories consumed and burned, which are generally tracked by smart wear. But the one feature which gives weightage to this smart wear, and sets it apart from other smart wear is Movano's app. Movano's app gives insights into the user's health and provides a brief, as well as extended changes. It can share insights about a person's sleep, how frequently they wake up during their sleep and the phases of their sleep cycle. Movano rings also monitor glucose and blood pressure. If you have been working out, then the app will put the data together and correlate the activity with your heart health and provide better health status.
Movano aims for the ring to be one of the most affordable health devices. The app will provide subscriptions to unlock additional features like guided workouts, advanced health insights, tools to reach fitness goals, and stress sensing with guided meditation. The Movano Ring will hold a beta release in the second half of 2022.

Reference:
https://www.digitaltrends.com/mobile/movano-health-tracking-ring-unveiled-at-ces-2022/

Bhavika Ramesh
ECE-A, 3rd Year

Blockchain Technology

What Is Blockchain?

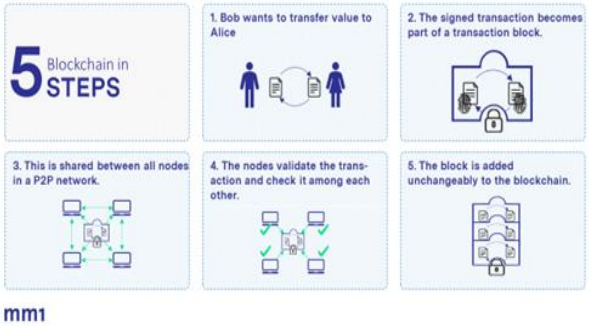
You can think of a blockchain like an obsessive club filled with members who love to keep track of things. The club has a ton of complicated rules to make sure that every member writes down the exact same set of records about what happens each day and that once data is recorded and accepted, it becomes exponentially more difficult to change as more and more records are added on top of it

Block?

Blocks are what store data on the blockchain — and it's up to whoever's making the blockchain to determine what kind of data they store. I could, if I wanted to, create a blockchain where each block stored the entire text of *The Great Gatsby*. Would it be efficient? No. Would it be dumb? Yes. For normal cryptocurrencies, though, blocks contain the records of valid transactions that have taken place on the network. I sent you a Mitchell Coin? Put it in a block. You sent me 10 Mitchell Coins in return? That's so kind of you! That's in the block, too. For cryptocurrencies, you can imagine blocks as boxes of receipts.

Chain?

Let's say I just made a new blockchain: the first block would be there, shiny and new, but lonely. Then, the second block would come along and



say, "the block before me is the first block." The next block would say "the block before me is the second block," and so on, creating a chain .

Reference :
https://www.simplilearn.com/tutorials/blockchain-tutorial/blockchain-technology#

Nashita
IT, 2nd Year

Remote Patient Monitoring Devices

Firstly, remote patient monitoring devices are also called as telemedicine/e-medicine.

What Is Telemedicine?

Telemedicine refers to the practice of caring for patients remotely when the provider and patient are not physically present with each other.

Why Telemedicine?

Telemedicine can dramatically reduce healthcare costs and deliver top-notch medical expertise to people everywhere.

Advantages of Telemedicine

1. No transportation time or costs.
2. No need to take time off of work.

3. Eliminate child or elder care issues.
4. On-demand options.
5. Access to Specialists.
6. Less Chance of Catching a New Illness.
7. Less Time in the Waiting Room.
8. Better Health.

Common Remote Patient Monitoring Devices

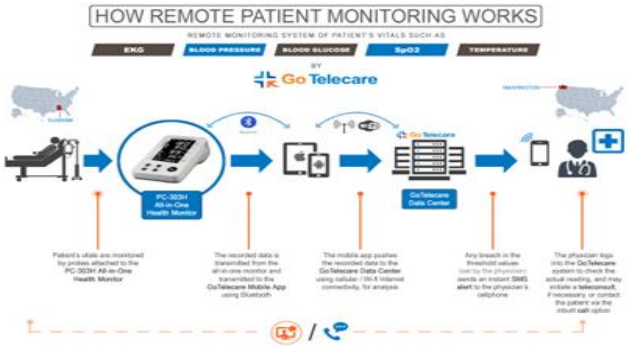
- Blood Pressure Cuff.
- Blood sugar monitoring.
- Glucometer.
- Wearables (Activity Trackers and Continuous Monitoring) Scale.

Disadvantages of Telemedicine

Though its an emerging and an important technologies coming out these days, these telemedicine also have some cons:

- The first and foremost thing is the cost. It's the cost that creating a barrier for a common person.
- Secondly each and every individual should have internet or broadband facility.

The important thing is that the person need to be active all the time to calculate its body condition.The below image briefs you the process or the working of the tele medicine.



So it can be concluded that keeping all the above disadvantages into account, if we could modify the present technology we would be the first one to treat the patients without any physical presence. Though there will be many technologies coming up, but the contribution in the health division is a world wide success.

Reference :

https://www.medicaltechnologyschools.com/medical-lab-technician/top-new-health-technologies

K. Bhavitha Sri
IT, 2nd Year

Metaverse

The Metaverse has become one of the trending technology and socioeconomic topic. Combining different technologies like VR, 3D animation, blockchain and many others, lots of companies are already working on creating services for this new digital world. Even tech giant Facebook changed its name to Meta. The Metaverse is an interconnected web of social, networked immersive environments in persistent multiuser platforms.

It enables seamless embodied user communication in real-time and dynamic interactions with digital artifacts. Its first iteration was a web of virtual worlds where avatars were able to teleport among them . The contemporary iteration of the Metaverse

"You can't use up creativity. The more you use, the more you have"

features in real world applications are virtual tourism (3D virtual tour), social interaction (people connect, collaborate ,communicate in virtual world),media and entertainment, immersive VR platforms compatible with massive multiplayer online video games, open game worlds and AR collaborative spaces and impact on commerce and trade as e-commerce platforms.

Addiction to virtual worlds can lead people to withdraw from real-world experiences. The metaverse disadvantages also bring the possibilities of the metaverse influencing the ways in which people perceive real relationships and interactions. The metaverse cons might also bring issues pertaining to privacy and security risks. As an online-enabled space, the metaverse can lead to new issues in security and privacy for individuals as well as institutions. The concluding view point is the observation of metaverse pros & cons gives a balanced idea of what the metaverse is and what it could be.

Reference :

https://economictimes.indiatimes.com/markets/cryptocurrency/five-real-life-uses-of-the-metaverse-that-investors-should-know-about/articleshow/89615934.cms

K.Chandra Hasini
CSE(AIML),1st Year

Edge Computing

Now-a-days we see many technologies around us through which many challenges were dealt with. One of it is EDGE COMPUTING. What is Edge Computing? Edge computing means decentralized data processing at the edge of the network. In real time we see data in huge amount. So to process this data we use Edge computing. Many companies use this for fast processing of data. Also, it is a full networked technology. Edge as well as cloud computing are becoming increasingly important for a growing number of processing industries.

These two technologies optimally complement each other, so by using these as data is processed by Edge Computing and further it is trained by Cloud Computing would be the best usage. Companies get flexible through Edge Computing.

When large amounts of data are processed by edge computing, a company's storage and transmission costs are reduced as only relevant data is transferred to a cloud or IT infrastructure.

Reference :

https://www.techtarget.com/searchdatacenter/definition/edge-computing

P. SAI VARSHITHA
IT, 1st Year

"Focus on your goal. Don't look in any direction but ahead"

Air Point Ring

Air point ring is a wireless wearable mouse that combines the functionality of a regular mouse with a ring shaped wearable unit. Putting on the Air Point Ring transforms your ordinary finger gestures into cursor movements. Now your fingertip has the ultimate power to control your presentations, gaming, 3D modeling and also reduce the fatigue associated with most devices. The Air Point Ring also supports 2D motion along with 3D motion. You can easily surf the net, scroll, and click with the highest level of convenience.

The mouse has the dual mode of operation; it can be seamlessly perform as your air mouse and can also swiftly convert to a surface mouse. The product also comes with a rechargeable AirPoint charger that allows you to charge your Ring by seamlessly docking into it. The battery can last upto 8-10 hours on a full charge. This device is supported by Windows, macOS, Android, Chrome OS.

In presentations, to navigate to the next slide, deactivate air mouse mode and tilt the thumb in clockwise direction. Likewise, to move to the previous slide, tilt the thumb in counter-clockwise direction. Kill mode is a quick way to prevent unwanted movement by disabling the AirPoint Ring.

K.Keerthi chowdary
IT-B, 3rd year

Drone In Agriculture

The days of walking in the fields, inspecting both weather and field to plan the crop now and then is almost gone. The hazardous effects of the pesticides on humans are about to abolish. Now-a-days drones assist farmers from analysing and planning to the actual planting of crops, and the subsequent monitoring of fields to ascertain health and growth.

DRONE stands for Dynamic Remotely Operated Navigation Equipment. **A drone is an unmanned aerial vehicle (UAV) or unmanned aircraft system**. It is essentially a flying robot this is controlled remotely with software-controlled flight plans embedded in its system that work along with sensors and a global positioning system (GPS).

Drones can help farmers to optimize the use of inputs (seed, fertilizers, water), to react more quickly to threats (weeds, pests, fungi), to save time crop scouting (validate treatment/actions taken), to improve variable-rate prescriptions in real time and estimate yield from a field.
One of the main innovations is precision agriculture. Precision agriculture helps farmers in better yielding while reducing wastes and the overall impact, ‘using less to grow more’. Drones are used to collect data from sky. It defines crop biomass, plant height, the presence of weeds, and water saturation on certain field areas with high precision. They deliver better

and more accurate data with higher resolution in comparison to satellites.
The agriculture sector is getting more efficient and profitable with the drone technology assistance.

Reference :
https://eos.com/blog/top-5-newest-technologies-in-agriculture/

Geethika Reddy
IT, 2nd Year

NFTS : The Digital Assets

What are NFTs ?
NFTs or Non-Fungible Tokens are digital assets that are stored on a blockchain. Now, this can be anything - an image, a video, a graphic, an icon, even a single pixel or piece of text, or a tweet for that matter. The non-fungible in Non-fungible tokens means that the item is unique and one of its kind. For example, a smartphone that you own is a fungible item since it can be replaced with the exact same one, in case its sold or goes away from you. This makes the smartphone a fungible item. But, on the other hand, something like a Kohinoor diamond is non-fungible, because there's only one of them and not every diamond is a Kohinoor diamond. So every non-fungible token is unique and one-of-its kind. NFTs can really be anything digital like a gif, a video, a photo, anything.
For buyers, NFT works as a speculative asset. This means that people buy the thing and hope for its value to increase over time. This, apart from the idea of supporting your favourite artists. Another factor is that it gives you bragging rights that you own a piece of art. NFTs are being treated like the future of art collection.

Are Non-Fungible Tokens Safe?
Non-fungible tokens, which use blockchain technology just like cryptocurrency, are generally secure. The distributed nature of blockchains makes NFTs difficult (although not impossible) to hack. One security risk for NFTs is that you could lose access to your non-fungible token if the platform hosting the NFT goes out of business.

Pros of NFTs
Investors have many reasons to want to buy assets that are tokenized into NFTs. Some of the advantages of investing in NFTs include:

- **Anyone can invest in NFTs:** Investing in tokenized assets is accessible to everyone. Asset ownership that is tokenized into an NFT can more easily and efficiently be transferred among people anywhere in the world.
- **NFT ownership is secured by a blockchain:** Using blockchain technology to digitally signify ownership can make an investor's ownership of an asset more secure. Blockchain tech can also make ownership of assets more transparent.
- **Opportunity to learn more about blockchain technology:** Investors can become more knowledgeable about blockchain, while diversifying their portfolios, by allocating a small sum to tokenized assets.

Reference :
https://www.theverge.com/22310188/nft-explainer-what-is-blockchain-crypto-art-faq

P. Ruchitha Sree
IT – B, 2nd Year

Robotic Surgery

Robotic surgery, or robot-assisted surgery, allows doctors to perform many types of complex procedures with more precision, flexibility and control than is possible with conventional techniques. Robotic surgery is usually associated with minimally invasive surgery — procedures performed through tiny incisions.

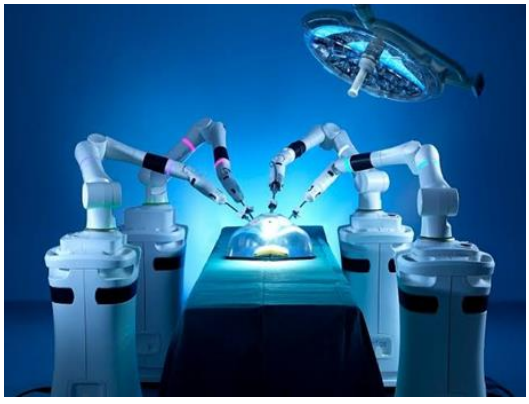
Why Robotic Surgires???
Robotic surgery offers many benefits to patients compared to open surgery, including:

- Shorter hospitalization
- Reduced pain and discomfort
- Faster recovery time and return to normal activities
- Smaller incisions, resulting in reduced risk of infection
- Reduced blood loss and transfusions
- Minimal scarring

Advantages of Robotic surgeries:

Major advantages for surgeons using robotic surgery include:

- Greater visualization
- Enhanced dexterity
- Greater precision



Disadvantages of Robotic Surgeries:

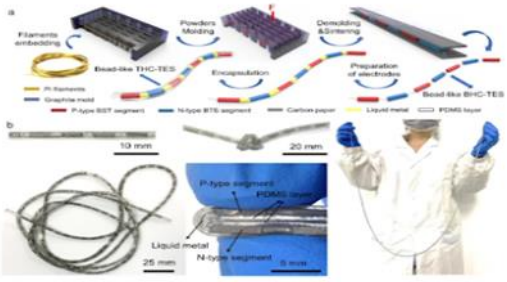
- Only available in centers that can afford the technology and have specially trained surgeons.
- Your surgeon may need to convert to an open procedure with larger incisions if there are complications.
- Risk of nerve damage and compression.

Reference :
https://en.wikipedia.org/wiki/Robot-assisted_surgery

L.Sai Manasa
IT, 2nd Year

E-textiles that cool you down in summer:

Imagine having something wearable that could cool you down in summers. Let's not imagine any more as a Chinese-led research team has invented a fabric that can generate power from heat for wearable electronics or help people cool down in the summer. According to the researchers, the thermoelectric textile, which resembles a wristband and can be twisted, knotted, bent, and stretched, can provide power for a pedometer or LED array.



Thermoelectric materials are employed in a variety of applications, including aircraft, infrared detectors, and computer chips, and

produce an electrical voltage when temperature variations between materials exist. Heat is transmitted from one side to the other when a voltage is given to the material, creating a cooling effect on one side – a principle used in heat pumps and some small freezers.
It feels like a normal wristband when worn on the wrist. We can use thermoelectric strings and textiles to make a comfortable thermoelectric generator that can create electricity and adjust the temperature of the body. Because of temperature differences between the body and the environment, thermoelectric textiles, in theory, can generate power around the clock. The researchers claimed that they were able to use the technique to reduce body temperatures by several degrees for the first time.

Reference :
https://www.rsc.org/journals-books-databases/about-journals/energy-environmental-science/

K. Nishitha Reddy
IT, 3rd Year

Genome Editing

Genome editing (also called gene editing) is a group of technologies that give scientists the ability to change an organism's DNA. These technologies allow genetic material to be added, removed, or altered at particular locations in the genome. Several approaches to genome editing have been developed. Gene editing can have particular advantages when “bad” genes are detected – genes that could endanger the health of an organism or its descendants. Thanks to new gene-editing technology, these harmful characteristics can, in theory, be altered. In this way, gene editing could deliver some drastic leaps forward in the fight against disease – in humans, animals, and crops.

Gene editing is of great interest in the prevention and treatment of human diseases. Currently, genome editing is used in cells and animal models in research labs to understand diseases. Scientists are still working to determine whether this approach is safe and effective for use in people.

It is being explored in research and clinical trials for a wide variety of diseases, including single-gene disorders such as cystic fibrosis, hemophilia, and sickle cell disease. It also holds promise for the treatment and prevention of more complex diseases, such as cancer, heart disease, mental illness, and human immunodeficiency virus (HIV) infection. Based on concerns about ethics and safety, germline cell and embryo genome editing are currently illegal in the United States and many other countries.

Reference :
https://medlineplus.gov/genetics/understanding/genomicresearch/genomeediting/#:~:text=Genome%20editing%20(also%20called%20gene,genome%20editing%20have%20been%20developed.

Sravya Gudipelli
IT-A, 3rd year

Augmented Reality is the Future

In the world of emerging technologies, virtual is the future! Augmented Reality is one of the fastest growing technologies. It has come a long way from science-fiction concept to science-based reality. It is a view of real, physical world in which elements are enhanced by computer generated input.

It could be sound to a video, graphics to a GPS to designing Metaverse. It creates a composite of virtual and physical world together in one frame. AR can be used in every possible way; like in homes, public spaces, research centers, industries, education, medical and a whole new perspective to the future. Augmented Reality technology has proven to be one of the top innovations opening up new growth in businesses around the world. It is the upgrading technology and Engineer's innovate methods to use it. There will be a lot of job opportunities. Choosing carrier in AR will definitely flourish

B.V.Meghamala
ECE, 2nd Year

The Future of Transportation: Electric Vehicles

INDIA, a country of 1.38 billion people, is said to have an estimate of 295.8 million vehicles up and running on its roads. In July 2021, the petroleum consumption for India was 4,492 thousand barrels per day and the necessity only seems to be heightening with a forecast of 10% growth in India's fuel requirement in 2021-22. This will be the fastest pace of fuel product consumption in six years. While the demand for petroleum is on the rise, the world is now looking forward to advanced alternatives.

The way we travel is changing. With technological advances and a desperate need for sustainability, vehicles are now becoming smarter and cleaner. Vehicle manufacturers worldwide are now turning their attention and investing in new electric fleets.

The Indian Government through its 'Faster Adoption and Manufacturing of Electric Vehicles' schemes has created momentum that

encourages the adoption of electric vehicles throughout the country. This mission helps reduce India's fossil fuel consumption and mitigates emissions by facilitating the production of Electric Vehicles (EVs) economically. With viable pricing, better charging infrastructure and an expanded grid capacity, the future of transportation can help us replace combustion engines with more sustainable electric alternatives.

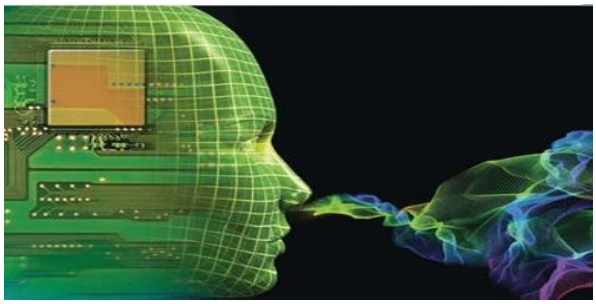
With many countries making e-vehicle policies based on the introspect of its highly increasingly attractive low carbon transport option, lower running costs and ever-improving range of models, the Electric Vehicles business is on a boom with almost 10 million electric cars on the world's road by the end of year-2020 with many more yet to come. The future of transportation is here and it sure is revolutionizing the world on the road.

Reference :

https://www.psa.gov.in/

Nishtala Harini
EEE, 2nd Year

Electronic Nose



An electronic nose is an sensing device intended to detect odours. Electronic sensing means the capability of reproducing human senses using sensor arrays and pattern recognition system. It consists of head space sampling, a chemical sensor array and pattern recognition modules to generate signal patterns that are used for characterizing odours.

Electronic nose includes three major parts: a sample delivery system, a detection system and a computing system. The sample delivery system is essential to guarantee constant operating conditions .The detection system consists of sensor set which is the reactive part of instrument. The computing system works to combine the responses of all the sensors which represents the input for the data treatment.

Most electronic noses use chemical sensor arrays that react to volatile compounds on contact. The commonly used sensors for the electronic noses include: mosfet (metal oxide semiconductor), conducting polymers, polymer composites, quartz crystal microbalance, mass spectrometers etc…It is mainly applicable in quality control laboratories, in process and production departments and in research and development laboratories. In future it can also used in fields of health and security, in fields of crime prevention and security and in environmental monitoring.

Reference :

https://en.m.wikipedia.org/wiki/Electronic_nose

Kankuri Varshitha
ECE-B, 2nd Year

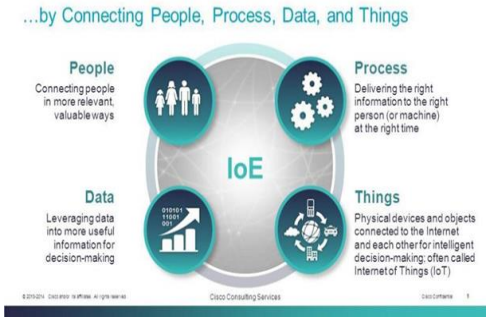
The Evolution of IoE from IoT

In today's scenario, we people are very much dependent on Internet, as the Internet is an important part of our daily routine. As we know the Internet is a medium of communication & because such a routine of accessing the Internet that creates a new horizon of the Internet of Things (IoT). The overview of the transformation of the Internet of Things (IoT) to the Internet of Everything (IoE). This is the fact that every evolution takes time to grow hence this evolution also grows according to phases and also following the slogan "Necessity is the mother of Invention". This transformational development is an important aspect because through this our technological environment and also our routine will be more comfortable. Through this comfortable technology, devices and user can meet their compatibility to achieve the goal of invention. As IoT & IoE both are upcoming interests for the internet world hence it is focused on such evolutionary development. The evolution of the global web has resulted in virtual connections ubiquitously penetrating real-world objects and activities. Today, everything can be connected with everything, creating a new distributed ecosystem that goes beyond the familiar IoT (Internet of Things) concept. Cisco has coined a special term **the Internet of Everything (IoE)** to describe this dynamically changing phenomenon. In this article, we will formulate the Internet of Everything definition and how it differs from the IoT.

IoT: The Internet of Things (IoT) may be a system of interconnected digital devices, machines, objects, animals, or people who are given unique identifiers, and thus the capability to transmit and share data over the network without the necessity of human-to-human or human-to-computer interaction. Bridging the gap between the physical and virtual worlds.

Technologies Developed IoT:

- Low Power Wide Area Networks (LPWANs) are the new miracle in IoT. By supplying long-range communication on small, reasonable batteries that last for days.
- Cellular next-gen 5G with high-speed mobility support and ultra-low quiescence is fixed to be the future of self-governed vehicles and escalated reality.
- Zigbee is a short-range, low-power, wireless standard (IEEE802.15.4), generally fixed in a mesh topology to extend content by relaying detector data over multiple detector nodules.



Evolution of Internet of Everything (IoE):

IoT is the intelligent connection between 4 key elements i.e people, process, data, and things. it's considered a superset of the Internet of Things (IoT). IoE covers the broader concept of connectivity where network intelligence works because of the foundation of the Internet of Things.

The Internet of Everything is predicated on the thought of all-around connectivity, intelligence, and cognition. Unlike computerized devices that believe in intelligent internet connections, any object is often fitted with digital features and connected to a network of other objects, people, and processes, to convert information into actions for brand spanking new capabilities and experiences.

Difference Between IoT and IOE :

- IoE is the intelligent connection between people, processes, data, and things by creating a 'web of things which is the next generation of the web.
- IoT is the network of physical devices where the gathering and exchange of knowledge occur without human intervention.

IoE Features :

- **Decentralization and moving to the edge** data are processed not in a single-center, but in numerous distributed nodes
- **Data input and output** — external data can be put into devices and given back to other components of the network
- **Relation to every technology in the process of** digital transformation cloud computing, fog computing, AI, ML, IoT, Big Data, etc. A rise in Big Data and the IoE technology development are interconnected

Conclusion:

Internet of Everything (IoE) is a promising paradigm that integrates the Internet of Things (IoT), Industrial Internet, Internet of People, and many Internet-based paradigms to transform the industry, society, and people's lives. The IoE will re-invent industries at three levels: business process, business model, and business moment.

Reference:

www.I-scoop.eu

Sripadi Meenakshi
CSE, 3rd Year

Unpiloted Aircraft

It is generally refered as “DRONE”. The technical term is ‘Unmannned Aerial Vehicle (UAV)’. Drones are used in many places such as monitoring climate change for natural disasters, photography, filming and delivering goods. The most well-known and controversial use is by the military for surveillance and targeted attack.

Abarham Karem is the founder of drone. So, Abraham Karem is regarded as the father of UAV(drone) Technology. DJI [Da-Jiang Innovations] is a Chinese technology company, which has been ruling the commercial drone industry for the longest time. It is currently the largest drone manufacturer in the world.

According to drone industry insights report 2020, the world wide drone industry is predicted to increase at a 13.8 percent CAGR to$42.8 billion by 2025. In the future, farmers could use unmanned aircraft to strategically monitor and spray their crops. These are also being used to monitor endangered species and map the changes in various ecosystems around the globe. During the pandamic, drones have helped communities to access goods and services. Regulators across the globe are looking at ways to support the expansion of drone technology, exploring carrying heavier loads and transporting people.

A drone is a flying robot that can be remotely controlled or fly autonomously using software called flight planes, that work in conjunction with onboard sensors and a global positioning systems(GPS).The most popular high demand careers in drone technology are drone photographer and filmmaker.

DRONE is abbreviated as D-Dynamic, R-Remotely, O-Operated, N-Navigation , E-Equipment

R.Shirisha
ECE-B 2nd YEAR

Self Driving Car Workshop

A report on the Self Driving Car Workshop which was organized by the Dept. of EEE of BVRITH, in Association with Tech Trunk Ventures Pvt. Ltd during December 16th to 18th, 2021.

The goal of the Self Driving Car Workshop was to give the students a taste of using AI along with Robotics to generate a quick interest in the students on technologies that are going to revolutionize the world.

Relevance of the Workshop

The world is moving towards the involvement of artificial intelligence and machine learning in all fields. Artificial intelligence and machine learning help people and businesses achieve key goals, obtain actionable insights, drive critical decisions, and create exciting, new, and innovative products and services. One of the biggest use cases of AI and ML is the Self

driving car. In this context, the workshop gave all the participants an insight on the design, development and working of the self-driving cars. It has clearly boosted the confidence of the participants to design interesting models.

The following topics were introduced to the participants:

1. Getting started with Arduino - Arduino is a platform (open-source) based on easy-to-use hardware and software. The participants were briefed about the arduino programming on the first day.
2. Connections - Teams were handed over kits which consisted of Arduino Uno board, L293D Motor Driver, wheels, Robot Chassis, Motors, connecting wires, USB cables and screwdriver. The connections were explained

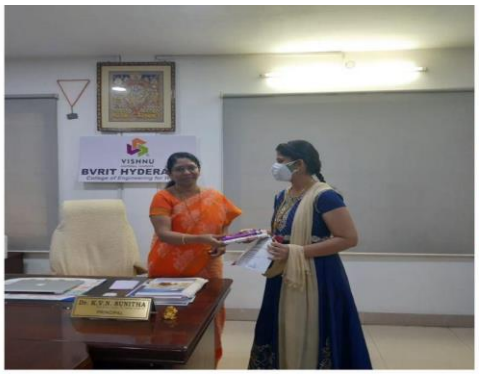
3. Controlling LED with Arduino - Once the connections were made, the code for controlling LEDs was uploaded to the board and the students could control the LED through their laptop.
4. GUI Development - The GUI was developed to handle various movements of the car.
5. Designing a basic PC Controlled Robot - Mr Pranay and Mr Harsh discussed the python code required to drive the car. The students installed various packages and worked on the code. Once this was done, the car prototype was moving depending on the commands given by the students.
6. Controlling Robot over Bluetooth - The HC05 bluetooth module was connected to the robot.
7. Image Processing - The students were briefed about image processing with python, manipulating images in python, compressing and conversion of images, taking live images from a network camera using IP Webcam.
8. Training the model - The participants learnt about collecting the images from the robot, using the images to train the neural network, using the model to predict the direction and saving the trained data.
9. Final Self Driving Car testing - The most interesting and awaited moment of the three day workshop was the testing of the car where the ANN on the computer drove the final robot.

Since this is the first workshop that we have attended after joining the college and since it was conducted offline, we, the second year students, thoroughly enjoyed it.

Srinika Varma
CSE (AI & ML), 2nd Year



✨ Appreciation to the BSMART coordinators and the Best Article contributors' ✨



RESNA

VISHNU
UNIVERSAL LEARNING

Hearty congratulations to our beloved Chairman Sir for being recognised by 2022 Honorary Fellow Award from RESNA
(Rehabilitation Engineering Society Of North America)

Contact us :
BVRIT HYDERABAD College of Engineering for Women
Plot No. 8-5/4, Rajiv Gandhi Nagar Colony,
Nizampet Road, Bachupally,
Hyderabad-500090
Phone: 040-42427773
info@bvrithyderabad.edu.in
principal@bvrithyderabad.edu.in
Technical Magazine : newsletter@bvrithyderabad.edu.in