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UNIVERSAL LEARNING

BVRIT HYDERABAD
College of Engineering for Women

ACCREDITED BY NAAC WITH GRADE : A | ACCREDITED BY NBA FOR 3 YEARS | All India NIRF Rank : 199

B - SMART

WE EXPLORE WE EXHIBIT

Name to Fame
Hackathon Stories
Technical Trends

Volume 5, Issue 2, September 2020
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B-SMART

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

VISION

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

MISSION

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

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

Principal's Message

"There is a powerful driving force inside every human being that, once unleashed, can make any vision, dream, or desire a reality."

— Anthony Robbins

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

BVRIT HYDERABAD College of Engineering for Women realizes that potential in every individual and open opportunity for them to be successful and grow further. The success stories have inspired us to achieve more. BSMART, our Technical magazine, present the success stories, technical ideas & creative works of students and faculty. I Welcome all to the 10th edition of BSMART.

The world is undergoing a pandemic situation where activities are restricted and movements are curtailed. BVRITH was quick in adapting to the new normal of education through online mode of working and learning. The college conducted five online FDPs with eminent speakers from across the globe and had a good participation across India.

Our students were also very active with different modes of learning. Many faculty and students have completed many certification courses those were offered in Coursera and EdX platforms. I would like to share some student achievements here which have made us proud. Our Alumni of 2012 batch ECE, Ms. Khyathi, secured a placement offer in Google. Ms.U. Supraja, student of 2016 batch CSE, secured her placement in Amazon with a package of 30LPA. We are very proud to announce her as our face for 'Name to Fame'. Two students, Ms.A.G.Pooja Manas of CSE and Ms. V. Laxmi Harshika of IT received Big Data Internships @ Carleton University, Canada. Many student teams have won prizes in the online hackathons, which you can read in the 'cover stories'.

I'm very happy to report that BVRITH received an NIRF ranking of 199 in Engineering category, being the only women's college in that range. BVRIT Hyderabad College of Engineering for Women is categorized as Band B Institution (Rank Between 26th – 50th) in the category of Private or Self-Financed College/Institutes in Atal Ranking of Institutions on Innovation Achievements (ARIIA).

Our students show great enthusiasm in presenting articles in BSMART and I appreciate their efforts and contribution. But we acknowledge the article that has a high degree of involvement and student contribution, by awarding it. This time, '3D Printing of Organs' is the article which is selected for the award.

I congratulate the students who contributed articles and furthermore the faculty members and student coordinators who worked enthusiastically for the magazine.

Stay safe, Stay healthy.

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

Contents

Name to Fame

Udayagiri Supraja has been enthusiastic since her childhood and as a result she will be always flooded with the questions whenever she come across the new things. She completed her 10th standard from Keshava Reddy EM High School and Intermediate from Rao's Junior College. She pursued her B.Tech in CSE at BVRIT HYDERABAD College of Engineering for Women and achieved a academic excellence award on 24th march 2018 as a department topper.

She has done Mentorship from Microsoft and Internship from OpenText and Infor.

She got certification from NPTEL in Introduction to ML, Joy of Computing using Python and Block Chain Design Use case and Architecture.She also acted as an Internshala Student Partner and has also received Excellence certificate. She also certified in Android App Development from Internshala.She participated in Hack2Hire hackathon at DBS and received the job offer from DBS, took part in ATL & IOT hackathon at BVRIT HYDERABAD.

"Continuous improvement is better than delayed perfection."

She started coding at her First year of B.Tech and then started coding on various Coding platforms like hacker rank, Hacker earth, interview- bit as a hobby which helped her to increase competitive programming skills. Her interest also exists even in developing various projects like Ease Check, Ingress. She has also been part of WISE, MRND and various coding clubs in the college. She also acted as Hostel In-charge in Seethamma Hostel. Her persistent efforts and never give-up nature is a source of inspiration to her juniors.

This all has not at all a cake walk for her, there are several hurdles and back steps through which she learned and coped up with the situations and achieved 6 offers from Amazon, Thought Works, DBS, Persistent, Quadratyx and TCS.

Udayagiri Supraja

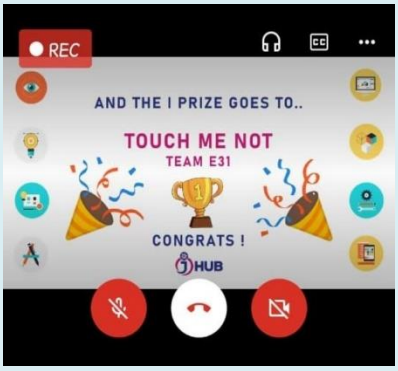
CSE 4th Year

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

COVER STORIES

COVER STORY – 1

First Prize Winner Of J-Hub Enlite-2020 And First Prize Winner For Best Pitch In Enlite 2020



Title :

TOUCH ME NOT

Team members:

Kavya Swamy

M. Krishna Tejaswi

S.Roshitha

D. Tejaswi

(EEE 3rd year)

Mentor :

M. Sudheer Kumar

Asst.Professor,

EEE Dept

We, the EEE 3rd year students of BVRIT HYDERABAD participated in J- HUB. It was a wonderful opportunity to present an idea in the form of business model. Our problem statement mainly focused on women safety.

As studying in women's college we thought to take this idea because most of the women are facing harassment & insecure during the night times. Even after 70 years of Independence still women are not safe to go out during night times. Aren't we all worried about our safety?

Our proposed solution works like this: we created a locket in which a push button will be present. Whenever a woman feels that she is subjected to harassment, she can press that button. Then directly, the alert reaches the police station and registered numbers in our app. There are many apps existing for women safety. Here the question arises is, what is unique in our solution!!! Taking the mobile and logging into the app are time taking processes. This problem can be overcome in our product.

Another thought was, what if the button is pressed by mistake? This could create a confusion among police!!! The solution for this was, to activate the alert we need to press the button twice with same frequency then only the alert reaches. We have conducted survey with people of different age groups, to know their opinion on our product. Many of them felt that our proposed solution is more effective compared to many other.

Then we did market analysis and estimated our capital and working expenses by doing balance sheet. The ROI (Return on Investment) we got is 12.4%. We wanted to make the locket economically feasible and accessible to everyone.

COVERSTORY-2

Second Prize Winner Of Jhub Excite-2020 Bootcamp.

Title :

NISHKRUTHI

Team Members:

K.Sai Manasa

N.Sai Snusha

T.Roshini

(ECE-B 3rd Year)

Mentors:

Mr.R.Priyakanth,
Associate Professor,
ECE Dept.,

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

We, K. Sai Manasa, N. Sai Snusha and T.Roshini are the students of II ECE, BVRIT HYDERABAD College of Engineering for Women. Our team has entered Excite 2020 Boot camp, as we are one of the winners of JHUB hackathon at CVR College of Engineering. We were really enthusiastic to join in the boot camp because of the inspiring reviews given by our seniors and faculty. Most of the sessions were on market research, problem validation, solution approach etc. As an outcome of the sessions we understood that the market research is not an easy task and it plays a crucial role in product development. After gaining enough knowledge, we entered into the practical era of implementing them. We were paired up with two other teams of different colleges. The topic given to us was the present pandemic situation i.e. COVID-19. Our idea was **NISHKRUTHI** – A knowledge management platform for the doctors by the doctors. This boot camp boosted our confidence and presentation levels. We could find ourselves really improved when we compared with ourselves before the boot camp. At the end, when Dr. G. Vijaya Kumari, Director of JHUB announced that our team has won the **SECOND PRIZE**, we were on the cloud nine and really excited. As a whole it was a memorable experience and learned many things in the way. We are now taking part in the JHUB EXCITE 2020 – A summer product development workshop.

"It's a slow process, but quitting won't speed it up."

COVER STORY -3

First Prize Winners of Virtual Hackathon 2020 organized by SRMIST in Association with INDIAN SERVERS. This team stood First place among 500 Students.

Title :

Facebook Fake Profiles Detection using Artificial Neural Network.

Team Members:

Prathapagiri Akshaya,

Aishwarya Thakur.

CSE-B 3rd Year

Mentor:

B. Sneha
Assistant Professor,
CSE Dept.

We, CSE-II students of BVRIT HYDERABAD College of Engineering for women Participated in Virtual Hackathon 2020 organized by SRM University and won 1st prize. As studying in a women's college, we thought to take this idea because most of the women are facing harassment & feel insecure. It was a 7 day hackathon and around 500 students participated in this hackathon. Under the guidance of Sneha mam and our seniors we are able to complete this successfully. As this is our 1st hackathon, we were so excited to participate and finally we won it. It was a 7 day hackathon, and on the very 1st day we were so confused from where to start but Sneha mam supported and guided us a lot and even our seniors supported us.

But from Second day we started working on our project. There were many problem Statements in that hackathon and some students even submitted solutions to 4 to 5 problem Statements, but we concentrated only on 2 problem Statements which are Fake Profile Detection and kaprekar number and solved them perfectly.

The main objective of our project is to build an application that detects if a user profile is genuine or fake. The application helps the users to identify whether the given profile is genuine or fake based on given profile details. Fake profiles are a major threat to the society, hence identifying fake profiles is a very essential task as they can cause identity theft, but their rapid and accurate identification is difficult most of the times due to lack of the necessary information.

"A ship is always safe at shore, but that is not what it is built for."

COVER STORY-4

Selected for the first cohort in Women Tech makers Engineering Fellows(WTEF) Program

Title:

'ShopSmart' an android application

Team:
Soundarya Kasarla
(IT 4th year)

I, Soundarya Kasarla from IT department studying at BVRIT HYDERABAD College of Engineering for women am a part of TalentSprint WE Program which is now addressed as Women Techmakers Engineering Fellows (WTEF) Program. TalentSprint Hyderabad has rolled out WE (Woman Engineers) program designed by TalentSprint and supported by Google. There were around 7276 applications nation-wide of which 100 students were selected after the assessment and telephonic interview. I was part of the first cohort i.e., one among these 100 students.

This was a 1 year bootcamp, where we had live online classes, mentoring session and team-based projects to enhance problem solving and computational thinking. The first assessment round was based on aptitude and logical thinking and later students selected in this round were having a telephonic interview. The telephonic interview was based on the assessment. In this 1 year bootcamp we had 1 month of bootcamp session in TalentSprint and later the whole program was done online.

My team-based project was 'ShopSmart' an android application. This project helps us in finding similar products from different websites and comparing their prices just by a click on your phone capturing the product through camera. I learnt a lot like what a good code is like, enhancement, optimization of code, new coding languages and standards, In-depth about most used programming languages, team work, formal way of speaking, writing and dressing, motivated, determined and confident than ever, knew how an industry works, knew about me like at what pace I am in and how much to be improved more and above all got to understand that nothing is impossible when you are determined enough to do it.

"Difficult roads often lead to beautiful destination."

COVER STORY-5

A Surprise Invite To

Singapore Foss Asia Summit

Idea:

System Automation By

Python

Team :
Satya Anusha Annamareddy
(IT 3rd year)

Mentor:

Dr. ArunaRao

Associate.Professor and

HOD, IT Dept.

Being a second year undergraduate at BVRIT Hyderabad College of Engineering For Women Telangana, I did not have much knowledge about what Open Source was and how everything functioned there. Always been fascinated by technology, I love to experience, explore knowledge. So with ever increasing love for the technology, I waited for opportunities. It was September when I first came to know about FOSSASIA .The FOSSASIA Summit is the premier Free and Open Source technology event in Asia for developers, start-ups, and contributors. Projects at FOSSASIA range from open hardware, to design, graphics and software. All credits goes to my faculty and Dr. Aruna Rao ma'am(HOD). She discussed about FOSSASIA SUMMIT with me but I was not confident enough to put my step forward. Then she said "It is better to try and fail than to wait for the next year." There was no looking back since then. Then I started browsing about previous summit's and explored the process and criteria of submission of proposal. Then I started thinking about ideas and submitting proposals. But I couldn't decide what topic to start with. Finally with again support of my faculty I got some ideas and started to write related to python. Then finally decided to start my proposal on "SYSTEM AUTOMATION BY PYTHON".I explained about automation, how that can be done by python language and real time applications including my idea to use this in placement hiring and HR Management.

Eventually, submitted my proposal with full of hope and confidence. I was quite excited and full of anxiety, the result was to be declared. Finally my proposal got accepted. I was more than happy on seeing my proposal got accepted and I am invited for summit at Singapore.It is really great opportunity for an undergraduate student to receive the invitation to Singapore.I was very happy, though I knew it was never going to be easy but it was totally worth journey. Finally I would like to quote " The best view comes after the hardest climb". It is not the end but a beautiful starting. I want to thank FOSSASIA for giving me this wonderful opportunity.

COVER STORY- 6

Achieved Security Training Scholarship from WiCys (Women in Cybersecurity) made possible by Google.

Title:

Security Training Scholarship

Team :

Sharaddha
(IT Department)

My name is Shraddha, and I'm a thriving cybersecurity professional. I became aware of the scholarship through a LinkedIn post made by Women in Cybersecurity, the scholarship application process was simple. The applicants were required to submit an online application form which required information about the applicant and why they think they need the scholarship. The qualifiers round was a CTF competition held on 7th August, which required knowledge web technologies, cyber forensics and cryptography. The competition lasted for 3 days and has 15 challenges to tackle. The competition overall took a lot of effort and time as each challenge will require you to pay attention to detail and also the ability to think out of the box. The qualifiers round was testing the participants problem solving skills. It took me around 2 days to finish all the 15 challenges.

After a week on 14th August, I got an email with the result of being selected. There were 938 applications out of which 100 applicants were selected to go to Stage-1.
The applicants were ranked based on:

- Personal statement on why this training is important
- Current self-driven activities in technology
- Attempts, activity and score in the qualification round

There are many communities in the security domain that try to empower students and people who are early in their career by providing training scholarships, internships and mentorships. It is always good to follow these communities to learn and look for opportunities like this scholarship.

COVER STORY-7

Drive to Foss Asia Singapore Summit-2020.

Title:

Digital Pay

Team :

KAVYA SWAMY
EEE-III YEAR

FOSSASIA SUMMIT is held in Singapore every year. It is the premier Free and Open Source technology event in Asia for developers, start-ups, and contributors. Projects at FOSSASIA range from open hardware, to design, graphics and software. Being a Second year graduate student from Electrical and Electronics Department I didn't know much about open source technology. My goal since 1st year was to get selected for FOSSASIA . I started to work on open source technologies with the help of WISE (Women in Software Engineering). I was not confident enough at starting later on I started to explore about previous summit.

In my 1st year summer holidays I had worked on django and developed a website. Based on that experience, I developed Digital Pay, which is a web application in which people can make the payments online. The specialty of this application is to set up a pre-paid account in which user can store money for future transactions, protected by password.

The user can login and can transfer the money to other accounts. User can also check the balance amount and the previous transactions made from the account. By this the user gets clear view about the all the transactions. All the information is kept confidential.

One day, when I got to know about the registration process. I made abstract of my project and submitted for FOSSASIA with the help of my faculty.

Finally one day I received my dream invitation from FOSSASIA as a Speaker. I was very much excited to receive the invitation summit at Singapore.

I knew that wasn't so easy. But I always believe that "Nothing worthwhile is ever easy. Remember that". I would thank FOSSASIA for giving me this opportunity.


BVRIT HYDERABAD
College of Engineering for Women
Approved by AICTE, Affiliated to JNTUH, Accredited by NBA and NAAC
International Online One Week
Faculty Development Programme on
Industrial Relevance of Electrical Engineering
Dates: 15th to 20th June 2020
Time: 2:00 PM to 3:30 PM
Link to Register
https://forms.gle/LBk8DSWDWuWZh4RN6
Mr. Siva Spurthy
Senior Manager, NTPC
Mr. Suresh Vengali
Electrical Engineer, Samsung Ltd, Korea
Mr. Anoop.A.Parapurath
Principal Engineer, ABB Power Grids
Mr. Rajshekhar Uchil
Senior Member at ISA, Bengaluru
Mr. Rajashekhar S
Head, Training and Documentation
OSI, Bengaluru
Mr. Bakhramzhan Rasakhodzhaev
Senior Researcher, International Solar Energy Institute, Uzbekisthan
Patron
Dr. K.V.N Sunitha
Principal
Convener
Dr. Ch. Sunil Kumar
HoD EEE
Coordinators :
Guruswamy R
+91 9985271464
K. Amritha
+91 9885511580


One Week International FDP on
Wireless Communications &
Mobile Technologies
06 - 10 July 2020
Organized by
Department of Electronics & Communication Engineering
in association with
QCares, Qualcomm
BVRIT HYDERABAD College of Engineering for Women
(Approved by AICTE, NewDelhi, Affiliated to JNTUH Hyderabad)
NBA Accredited - EEE, ECE, CSE and IT | NAAC Accredited with "A" Grade


BVRIT HYDERABAD
College of Engineering for Women
On the Eve of
ENGINEER'S DAY!
International Webinar
on
"OPEN SOURCE SOFTWARE
AND OPPORTUNITIES"
15th September 2020 , 3:00 to 4:00PM IST
by
Mr.DANIEL MASLOWSKI
Software Engineer
Germany
Registration Link:


TiE Talks
TRANSFORMATION OF
EDUCATION & ROLE OF E-LEARNING
POST COVID19
MAY 05, 2020
TUESDAY @ 6PM
LINK TO REGISTER
bit.ly/tietalksvdu
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Concept note :
to 31
o 12 noon
iddharth Satpathy,
niversity of
mrita Satapathy,
IT, Bhubaneswar.
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ofessor, Gangadhar
mbalpur.
aswati Pattnaik,
ollege.
eepika R. Gardner,
BVRITH.
Faith Manjusha
Professor,


siliconindia
One Week Faculty Development Programme on
"Advanced Data Science with Applications"
(22 - 26 June, 2020)
Mr.K.Venkata Rao
IIMC, ISI Calcutta
Vice President- Data Science,
REACHOUT ANALYTICS
Organized by
Department of Computer Science and Engineering
&
Department of Information Technology

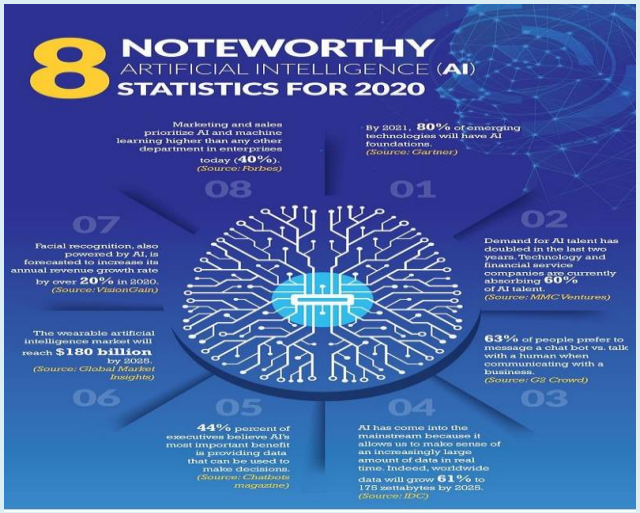

BVRIT HYDERABAD
College of Engineering for Women
ACCREDITED BY NAAC WITH GRADE : A | ACCREDITED BY NBA (EEE, ECE, CSE & IT) FOR 3 YEARS | NIRF 147 Rank
Online Faculty Development Program
On
Artificial Intelligence
22-05-2020 to 26-05-2020
ganized By: Department of CSE & IT in Collaboration with Brain O V

The Latest Advancements in Artificial Intelligence - A Survey

There is no chance that AI is going to beat any new technology in the coming years. It's advancement in every field that has led start-ups to deal with the presence of data.

- The recent market has understood the concept of AI and cloud working together.
- The machine that wants to behave like humans cannot have its judgment.
- The more the presence of data, the more quickly and in-depth results one gets.

Human interactions are much complex than AI.

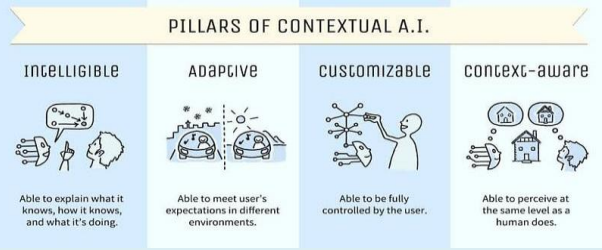


The human-made voice propagates in expedite form. In reality, there comes an interrogation on AI redefining customer interactions with voice AI. It lacks the list of human interactions filled with nuances, pre-set beliefs, cultural and societal ways.

AI can minimize dependency through autonomous systems and handles more value-oriented tasks to its growth and productivity.

According to the recent stats and figures,

- AI-powered Voice assistants foster to reach 8billion by 2023.
- Canadian researchers pursuing AI are funded with $492 million through NSERC by the Federal Government.
- The global AI market anticipated reaching $60 billion by 2025.
- One cannot suffice the 17% growth of AI in the podcast industry.
- AI conceded business growth by 40%.
- AI startups are getting a foot on the door more than the last two decades.
- AI processing devices are used by 77% in one form or another.



Here is the list of some advancement in the field of artificial intelligence.

1.Chatbots contextual technology: The technique which is more rational than emotional is contextual technology. Its contextual capacity is still unproven and deals with obfuscation. The upcoming global contextual chatbots market include Nuance Communications, chatfuel, artificial solutions, Google, acquire.io, AWS, botsify, snatchbot, IBM Corporation, floatboat, boost.ai, chatteron are few of them. The most advanced and powerful AI computing model that can talk and write like a human is GPT-3 (Generative Pre-Training-3).

2. **The rise of Graphic Designers:** The designers are known for their creativity and human touch.The Adobe new AI tool called sensei acts

as the assistant to create the perfect customer experiences through visual assetsIt can only work as the assistant while the ideas are human-based.

3. AI and cloud can go hand in hand: As AI needs data to function an algorithm, there is no defile of data in the cloud. AI programs work on accessing the data from the cloud storage that can be helpful in the decision-making process and communication.

4. AI in Healthcare: Much advancements are coming in the research and development of the treatment, diagnose a disease from CT lung scan, model the protein structure of the **SARS- COV-2 virus that comes COVID19**.

5.Banking solutions: with AI Make a new investment decision using AI in banking solutions. The features include Scalability, automation, ease of use, risk analysis, and decision-making assistance for a good experience for banking requirements.

Conclusion :

Artificial intelligence has made its improvement in every field. Now the challenge is to avoid the robotic sound and to ease voice conversion technologies with emotions.

Reference: www.yourstory.com

Mr. A.Rajashekar Reddy
Assistant Professor
Department of IT

Journey of an iOS - An i-phone Operating Systems

Steve Jobs introduced an i-phone on Jan 9, 2007 which works on an operating system known as iOS formerly called as an iPhone OS. The Journey of i-phone was started with the first version of its operating system iOS1 released in June 2007 with the features like capacitive touch screen, pinch –to-zoom, inertial scrolling, mobile safari web browser, visual voice mail and google maps. It's next version iOS1.1 was released in September 2007 has added features like ipod touch compatibility and iTunes Wi-Fi music store followed by the version iOS 1.1.3 released in January 2008 with f web clips on home screen, icon rearrangement features, multi touch keyboard and improved location finding features.

iOS 2 is released in July 2008 with the features of app browsing and installation. iOS SDK was also introduced with more functional apps and improved appearance along with other features like Microsoft exchange support. In September 2008, iOS 2.1 was released with improved battery life, dropped call fixes. With the features like Google street view and podcast downloads, iOS 2.2 version came into existence in November 2008.

iOS 3 was released in June 2009 with exciting and more useful features like cut, copy and paste, Voice control, MMS, USB & bluetooth tethering, landscape keyboard and Find my iphone. iOS 3.2 was released in April 2010 with the features like location based on apple data, bluetooth keyboard support, iBooks and also supports ipad resolution.

With the features of fast app switching, retina display support, face time video chat using Wi-Fi along with home screen folders iOS 4 version was released in June 2010. Personal hotspot using CDMA was the added feature of iOS 4.2.5 released in February 2011. In March 2011, with the feature of personal hotspot using GSM, iOS 4.3 was released.

iOS 5 was released in October 2011with the features of iCloud for file back up and multiple device sync. Voice control feature released in iOS 3 was replaced with Siri- a virtual assistant and one of the most popular features. Also, the features like iMessage to exchange free multimedia messages. An iOS 5 devices need not to be physically tethered to a computer via USB when activated.

In iOS 6, a feature called passbook was introduced to facilitate mobile payment for tickets, boarding passes etc. The features of Siri were also enhanced. With the release of iOS 7 in September 2013 Touch ID – finger print biometric sensor to unlock phone, AirDrop- Ad-hoc sharing of images, videos and files are the added features.

In iOS 8, which was released in September 2014, features like continuity for enhanced interactivity between iphone or iPad and Mac computer is introduced. Also, features like third party keyboard support along with Health kit (fitness trackers data) and Home Kit (for Home automation) were very exciting.

With the release of iOS 9 in September 2015, 3D touch, News spotlight search, wallet which replaced passbook app, data migration support from Android device to iOS device were introduced. The release of iOS 10 in September 2016 was came up with lock screen features, hiding home screen icons along with new Home app to securely manage and control home kit enabled accessories.

File manager including cloud storage, and for iPad features like Dock – app control centre to quickly open and switch apps, multi-tasking – use two apps at the same time, drag and drop were introduced with iOS 11 version in September 2017. Further in iOS 11 apple pencil features, augmented reality kit were also introduced.

iOS 12 came into existence on June 4 2018, followed by iOS 13 released on June 3, 2019 with more features which include dark mode and Memoji support for A9+ devices. The NFC framework now supports reading several types of contactless smartcards and tags. The latest version of iOS 14 released on 22nd June 2020. Some new features introduced in iOS 14 and iPadOS 14 include the App Library, which automatically categorizes apps into one page, Picture in Picture in iPhone and iPod touch, and the CarKey technology to unlock and start a car with NFC

(Courtesy: Smart Devices and Mobile Emerging Technologies – Coursera)

Dr. J. Naga Vishnu Vardhan
Professor, ECE &
Professor-in-charge-
Academics

Fruit peels to turn old battery to new: Waste-to-resource

A novel method of using fruit peel waste to extract and reuse precious metals from spent lithium-ion batteries in order to create new batteries was developed by Scientists led by Nanyang Technological University, Singapore.

The team demonstrated their concept using orange peel, which recovered precious metals from battery waste efficiently. they then made functional batteries from these recovered metals, creating minimal non-toxic waste in the process.

An estimated 1.3 billion tonnes of food waste and 50 million tonnes of e-waste are generated globally each year. This method not only tackle

the problem of resource depletion by keeping these precious metals in use as much as possible, but also the problem of e-waste and food waste accumulation – both a growing global crisis that aims towards technologically advanced solutions to the sustainable future.

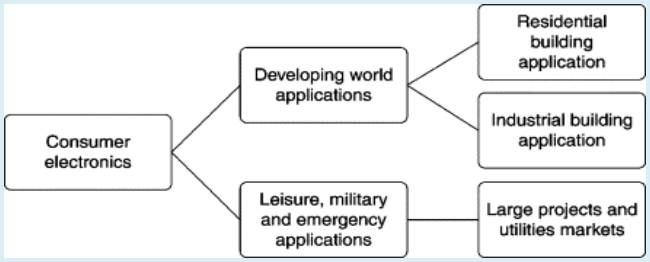
The NTU team found that the combination of orange peel that has been oven-dried and ground into powder, and citric acid, a weak organic acid found in citrus fruits, can extract valuable metals by dissolving the mass of crushed and shredded batteries followed by treating with hydrogen peroxide under heat, before letting the metals precipitate. This approach successfully extracted around 90 per cent of cobalt, lithium, nickel, and manganese from spent lithium-ion batteries. Asst Prof Tay explained: "The key lies in the cellulose found in orange peel, which is converted into sugars under heat during the extraction process. These sugars enhance the recovery of metals from battery waste. Naturally-occurring antioxidants found in orange peel, such as flavonoids and phenolic acids, could have contributed to this enhancement as well."

Dr.V.Madhavi,
Associate Professor of Chemistry,
BS & H Dept

Polymer Solar Cell

The polymer solar cell is a layered structure consisting of, a transparent front electrode, an active layer which is the actual semiconducting polymer material and a back electrode printed onto a plastic substrate. Polymer solar cells perform exactly the same function as any other type of solar cell (the conversion of photons into an electrical current) and will as such enter a well-charted market realm with numerous types of solar cells and numerous possible applications. But the technology is still in development. The present technology's early stage of maturity, with the recent initial market introduction of low-performing, high-cost, low-lifetime solar cells compared to other types of solar cell, poses a grand challenge. Thus, potential market areas for polymer solar cells have been a topic for much discussion over the past decade among industry, academia and technology competitors.

Polymer solar cell technology's typical features, such as light weight and flexibility, may ease market entry, but this has not yet been established as a fact. Flexibility and light weight possess great functionality in processing polymer solar cells, but in application and product integration especially flexibility seems to have limiting factors, at least at this point in technology development.

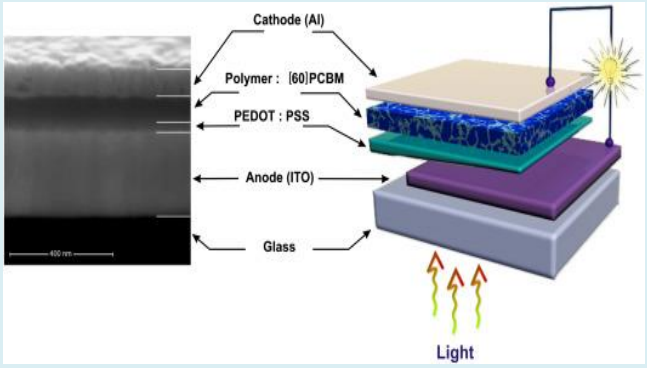


Polymer solar cells were not available in marketable forms until 2009, when Konarka Technologies introduced the first low-performing polymer solar panels , numerous application ideas have been formulated and a few of these tested.

"If you can't do great things, do small things in great way."

In perspective, polymer solar cells possess the potential to be applied within consumer electronics, developing world applications, leisure, military and emergency, residential building and industrial building add-on or integration and finally large-scale utility.

In comparison with existing types of solar cells, flexible solar cells (like polymer solar cells) create a number of application possibilities because they are potentially cheap, flexible, lightweight, semi-transparent, variable in color, environmentally friendly and provide portable solar energy. These technology-specific factors, in many ways, represent market opportunities as well as threats. Portable solar energy has been a dream since solar energy was discovered and admittedly possesses interesting possibilities if the solar cell is cheap enough, and if the PCE (Power Conversion Efficiency) matches the portable application. External limiting factors are the need for energy and the storage of energy , i.e. the available application and battery capacity coupled with the PCE of the solar cell.



The field of portable electronics today is power-hungry and current portable solar cells cannot power a cell phone, a music player or a laptop – it merely represents a back-up or trickle charge-scale power source and does not provide power 'on the go', as many would like it to do. In fact, solar cell being portable does not mean that it can charge the batteries in your gadget while you are on your way to work as this would take a full day or more of direct sun onto the solar cell.

Accordingly, a number of disadvantages rest not only with polymer solar cells, but also with adjacent technologies necessary for product integration. The vision for polymer solar cells is power production at low cost. At present time, the position of polymer solar cells is in between continued technology development and initial market introduction, and consequently affordable power production is far from being within reach. As the technology matures, new applications can be created and new market segments entered.

A typical polymer solar cell consists of a glass substrate coated with a layer of indium tin oxide (ITO) acting as the anode. The ITO is then covered by a hole transport layer thin film such as poly (3, 4-ethylene-dioxythiophene) polystyrene sulfonate (PEDOT: PSS). Then the active layer is deposited by wet processing (spin-coating, doctor blading, screen-printing, ink-jet printing) or by evaporation (usually for the case of small molecule). At last the cathode (Al and/or Ca) is evaporated and selected to match the energy levels of the acceptor (fullerene derivative).

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Ms. K. Bhavya
Assistant Professor
Dept. Of EEE

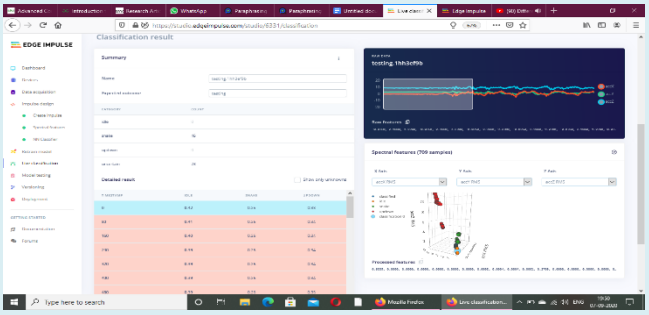
"Even the darkest night will end and the sun will rise."

Edge Impulse: Making Things Smarter

Why Edge Impulse?
Edge Impulse enables developers to create the next generation of intelligent device solutions with embedded Machine Learning

Different Phases in Edge Impulse ?

1. Device connection
2. Data Acquisition
    a. Training Dataset
    b. Test Data
3. Impulse Design
4. Retrain Model
5. Live Classification
6. Model Testing
7. Versioning
8. Deployment



How is it smarter ?

1. You can collect data from development boards, from your own devices, or by uploading a prebuilt data set.

2. You can add data from any device through the Ingestion API.

3. An impulse takes raw data, uses signal processing to extract features, and then uses a learning block to classify new data.

Note: This is the smarter part; based on the raw data extracted from devices. While creating the process block, It automatically recommends what type of data it is **Image, Flatten, Audio (MFCC), Spectral Analysis, Raw data and provision to add new data types.** While creating the Learning block, It automatically recommends the best approach based on the data type, **Transfer Learning (Images), Neural Network (Keras), K-means Anomaly Detection.**

4. You can classify data from any device through the Ingestion API. with a simple click on **Start Sampling.**

5. You can deploy your impulse to any device. This makes the model run without an internet connection, minimizes latency, and runs with minimal power consumption.

Where can I use it?
Environmental sound classification, Audio classifier, Image classifier, gesture classification, to help physical and mentally challenged people soon.

References:
https://www.edgeimpulse.com/

Dr. Nara Sreekanth,
Associate Professor,
Dept of CSE

"Today is yesterday's tomorrow, so everyday is important."

DNA Digital Data Storage:

The magnetic or optical data storage systems that currently hold this volume of OS typically cannot last for more than a century.

An alternative to hard drives is processing: DNA based data storage . DNA digital data storage is the process of encoding and decoding binary data to and from synthesized strands DNA. It consists of long chain of nucleotides A ,T,C & G which is life's information storage material. Data can be stored in the sequence of these letters turning DNA into a new form of Information Technology. It is already a routinely read, synthesized and accurately copied with ease . It is also incredible stable and storing it doesn't require much energy. According to calculations published in 2016 in 'Nature' materials , the simple bacterium E-coli has a storage density of about 10^{19} bits per cubic centimetre. University of Washington and Microsoft research have developed a fully automated system for writing , storing and reading data encoded in DNA .

DNA bar coding is now being used to dramatically accelerate the pace of research in fields such as chemical engineering, materials science and nano technology

Among the challenges to making DNA data storage commonplace are the costs and speed of reading and writing DNA, which need to drop even further if the approach is to compete with electronic storage. Even if DNA does not become a ubiquitous storage material, it will almost certainly be used for generating information at entirely new scales and preserving certain types of data over the long term.

Reference : https://www.scientificamerican.com/article/dna-data-storage-is-closer-than-you-think/

A.Vaishnavi
ECE-B 2nd Year

VIZR-Smartphone Adapter

The VIZR, a smartphone adapter, that creates a virtual display using the phone and an app to give the navigation directions without having a look down at the phone.This new product from FIXD is the new solution to distracted driving and it is a universal product which is compatible with all kinds of smart phones.

The VIZR consists of a base (where we can place our phone) and a translucent screen. The base has a non-slip coating so it doesn't slide around when we are executing hard turns. The phone projects onto the screen allowing the person to see a virtual HUD for navigation app. As, the phone's display is mirrored, the orientation will be flipped. Thus, we need an app that has a HUD setting. The one recommended by FIXD is Hud way Go. The VIZR is large enough that FIXD states that it will work with any smartphone. The base is 6 3/8 inches long with the reflective part being 2 5/8 by 5 5/16.

Although large, the VIZR is not big enough to fit tablets or tablet phones.

Its reflection rate allows to get a good reflection even on a clear day. When it's dark outside, it decreases the smartphone brightness to avoid the second reflection on the windshield.

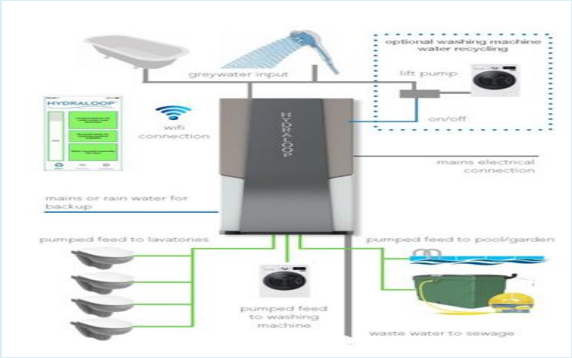
VIZR has an ultra-grip mat that leaves no messy residue on the dash that means it has a feature of slip resistance. VIZR also has a trip mode that shows the driver some information about the most recent trip, including the miles drove and also displays the average speed.
The major advantages of VIZR are:
It will easily navigate while keeping eyes on the road**.** It also checks the speed, maps, traffic etc.
The steps to use VIZR are as follows:
First, we need to take VIZR out of box and then place it on the dash. Now we need to select the navigation feature, then place the phone on VIZR. As the view becomes virtual display, one can conveniently drive and navigate while viewing the road ahead.

Reference:
https://the-gadgeteer.com/2019/03/19/fixd-automotive-puts-a-vizr-heads-up-display-in-your-car/

Tejaswi Dayyalae
EEE 3rd year

HYDRALOOP - Smart Water Saving

Hydraloop water recycler is a unique water treatment technology that ensures clean, clear and safe water to reuse again. This treatment system combines six technologies: Sedimentation, Flotation, Dissolved Air Flotation, Foam fractionation, Aerobic Bioreactor and disinfection using UV light. This product is fully automatic ,self-cleaning ,low maintenance, affordable, no filters, no chemicals and can recycle up to 95% of shower & bath and optionally 50% of washing machine water so we recycle and reuse up to 85% of total in-house domestic water. The Hydraloop smartphone App informs the amount of water you recycle & save per day/week/month. With the Hydraloop home App, we can also optimize water saving, as it will assist and inform us .



All other existing water treatment systems use filters or membranes to treat water, which clog and need regular cleaning and maintenance. The Hydraloop technology is the heart of the system - removes dirt, soap and other pollution without using a filter, membrane or chemicals.

U.Anitha Jyothi
ECE-B 3rd year

Biosensor-equipped glasses

Monitoring your blood sugar is the best way to find out how well your diabetes is being controlled. Diabetes disease that affects 62 million people in the Americas and 380 million worldwide. The usual blood sugar check involves sticking your finger with a small needle called a lancet, putting a drop of blood on a test strip, and using a meter that displays your blood sugar level. This process, which may be repeated several times a day, can be painful and carries a risk of infection.

Biosensor-equipped glasses could monitor diabetes through tears. The biosensor can detect an enzyme called glucose oxidase, which is widely used to detect free glucose in body fluids in tears that can also measure vitamin, alcohol levels, and other degenerative diseases. Biosensors can measure biological or chemical reactions and generate a signal proportional to the concentration of a particular substance. The biosensor is painless as well as safe to use.

Whenever the patient produces tears, it will come in contact with the biosensor. As the tears come into contact with the glucose oxidase biosensor, it alters the flow of electrons and generates a signal that is transferred to a device installed in the arm of glasses. That sends the results to a computer or smartphone. Apart from being painless, the biosensor could decrease infection risk in people who frequently use glycosometers.

Reference:

https://www.biotecnika.org/2019/12/glasses-to-monitor-diabetes-through-tears-biosensor-equipped-glasses/

K. Aishwarya
ECE-A 3rd Year

Flying Cars

Flying cars are the next generation of travel. A flying car is a type of personal air vehicle or roadable aircraft that provides transportation by both air and ground. For more than century car and aviation enthusiasts have been fantasizing about flying cars.

These smaller and lighter flying cars operate with lots of tiny electric fans blowing air from many places. Wing and propeller design can also be optimized to be long and thin with lots of moving surfaces, just as birds do to make their flying efficient. The aim of all of these technical enhancements is to achieve maximum lift for minimum drag.

Vertical takeoff and landing design include rotorcraft with folding blades, as well as ducted-fan and tiltrotor vehicles. Ducted-fan aircraft tend to easily lose stability and have been unable to travel at greater than 30-40 knots. Flying cars would be used for shorter distances, at higher frequency, at lower speeds and at lower altitudes.

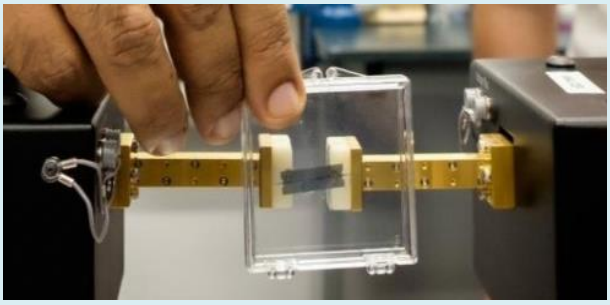
According to a new study published in Nature, for some journeys flying cars could eventually be greener than even electric road cars, cutting emission while also reducing traffic on increasingly busy roads.

Reference:
https://en.wikipedia.org/wiki/Flying_car

P.Sneha
CSE-A 3rd Year

Ultra-High-Speed terahertz wireless chip

To enable data transmission speeds that surpass the 5th Generation (5G) standards for telecommunications, scientists from Nanyang Technological University, Singapore (NTU Singapore) and Osaka University in Japan have built a new chip using a concept called photonic topological insulators.



This chip can transmit terahertz (THz) waves resulting in a data rate of 11 Gigabits per second (Gbit/s), which is capable of supporting real-time streaming of 4K high-definition video, and exceeds the hitherto theoretical limit of 10 Gbit/s for 5G wireless communications. THz waves are part of the electromagnetic spectrum, in between infrared light waves and microwaves, and have been recognised as the next frontier of high-speed wireless communications.

However, fundamental challenges like material defects and transmission error rates found in conventional waveguides such as crystals or hollow cables, need to be resolved before THz waves could be used reliably in telecommunications. These issues were overcome using Photonic Topological Insulators (PTI), which allows light waves to be conducted on the surface and edges of the insulators rather than through the material.

This discovery could pave the way for more PTI THz interconnects structures that connect various components in a circuit to be integrated into wireless communication devices, to give the next generation '6G' communications an unprecedented terabytes-per-second speed (10 to 100 times faster than 5G) in future.

With the 4th industrial revolution there is need to handle high volumes of data wirelessly, and relies on communication networks to deliver ultra-high speeds and low latency. By employing THz technology, it can potentially boost intra-chip and inter-chip communication to support Artificial intelligence and cloud-based technologies, such as interconnected self-driving cars, which will need to transmit data quickly to other nearby cars and infrastructure to navigate better and also to avoid accidents.

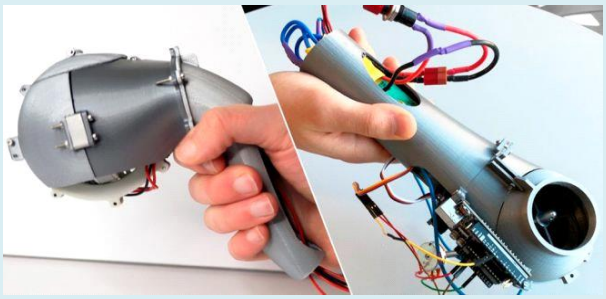
Areas of potential application for THz interconnect technology will include data centres, IOT devices, massive multicore CPUs (computing chips) and long-range communications, including telecommunications and wireless communication such as Wi-Fi.

Reference:
https://phys.org/news/2020-08-scientists-ultra-high-speed-terahertz-wireless-chip.html

Kona Deekshitha
ECE-A 3rd Year

Robotic Guide Dog

Guide dogs play an important role as a mobility aid for the visually impaired, but they aren't the perfect solution for everyone. Things like the cost, smaller living quarters or even allergies can mean that these canines aren't suitable for many, but a technology under development at Loughborough University offers up another possibility, by channeling the functions of a guide dog into a robotic device you can hold in your hand.The device is called Theia and was conceived by industrial design student Anthony Camu, who drew inspiration from virtual reality gaming consoles and autonomous vehicles. The technology is currently in prototype form with a few kinks to be ironed out.

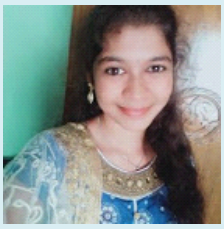


Theia, named after the titan goddess of sight, is a portable mobility and concealable handheld device for visually impaired people that guides them through outdoor environment and large indoor spaces with very little input. Essentially the best way to describe it is: it is a guide dog in a machine. Using a special control moment gyroscope(MG),Theia moves users hands and physically "leads" them -much like holding the brace of guide dog. The device processes the real-time online data, such as traffic density and weather, to guide users accurately and safely to their destinations. It will have a fail-safe procedure for high-risk scenarios, such as crossing busy roads-pushing the user back into a "manual mode". Making people think less about what they are doing so they can concentrate move on the better things such as where they are going to go in the end.

The benefits of having a guide dog go well beyond its role as a guide, and the life-changing impact in terms of wellbeing and companionship is not something technology can replicate.
The ultimate goal is that Theia's users can transverse routes safely and efficiently, at the same pace - or even faster than - ordinary people, without the worry and hassle of visualizing the environment.

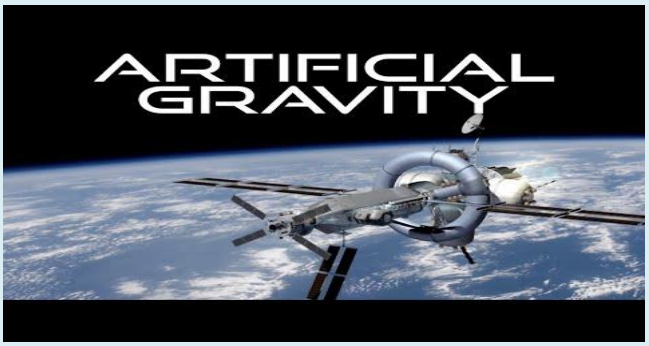
Reference:
https://www.sciencefocus.com/future-technology/future-technology-22-ideas-about-to-change-our-world/

V.Raghamala
EEE 3rd Year



Artificial Gravity

Any astronaut returning to earth from the International Space Station does their best to smile for the cameras but struggles to stand. Put a human being up in space, away from the gravitational bonds from the surface of the earth, and they'll experience weightless. For gravitation big lesson from the Einstein is Equivalence principle: that a uniformly accelerating reference fame is indistinguishable from a gravitational field.
Artificial gravity is the creation of an inertial force that mimics the effects of a gravitational force, usually by rotation. Rotational stimulated gravity has been used in stimulations to help astronauts train for extreme conditions.



Artificial gravity can be created using a centripetal force. With any rotation wheel in space, thrusters rotate the bun around the axis, generating a centripetal force. Anyone inside the hallow wheel experiences a similar effect to gravity, as if they were being pulled towards the outer curved hull. The amount of artificial gravity generated depends on the size of wheel and speed of rotation.

Astronauts experience bone loss, muscle loss, cardiovascular deconditioning and more in space. Artificial gravity has been suggested as a solution to various health risks associated with spaceflight. As a result there are several ongoing initiatives - try to understand and minimize the impact of weightlessness.

Reference:

https://en.wikipedia.org/wiki/Artificial_gravity

N. Mahalaxmi
CSE-A 3rd Year

Vyom Mitra – Humanoid to accompany human

Sometimes, we cannot do things on our own. We need someone to help us. It may be a human or a humanoid. Yes, you read it right. A HUMANOID. Humanoid refers to a robot which resembles human. It may be used for functional purposes, research or for interacting with human tools and environments or for space researches.

Some of them are Russian humanoid FEDOR, Valkyrie, a humanoid built by NASA and Vyom Mitra, a humanoid by ISRO.

Vyom Mitra is the first half humanoid which was unveiled by The Indian Space Research Organization (ISRO) at the Human Spaceflight and Exploration symposium on 22nd January, 2020. India aims not to fly animals onboard experimental missions. Instead, we will flu humanoid for better understanding. Vyom Mitra in Hindi translates to Space-friend. It is a female looking half-humanoid built to accompany astronauts in space missions. Where there is hard work, there will be success our scientists have proved it. Vyom Mitra is the result for the efforts put by the scientists who are a part of ISRO Inertial Systems Unit in Thiruvananthapuram.

On 22nd January, 2020, Vyom Mitra introduced herself to the gathering saying, “I am Vyom Mitra. I can do switch panel operations, ECLSS [Environment Control and Life Support Systems] functions, be a companion, converse with the astronauts, recognize them and also respond to their queries.”

Vyom Mitra is programmed and trained to speak in both Hindi and English languages. She can take up different postures which are suitable for launch and take commands.

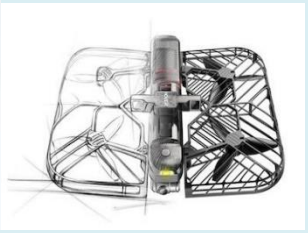
Reference:

https://en.wikipedia.org/wiki/Vyommitra

M. Lakshmi Harita
EEE 2nd Year

Hover 2 – The 4K Drone That Flies Itself

Hover 2 introduces an entirely new drone experience giving you gorgeous shots of your life from every angle with unprecedented ease. Innovations like Optical Radar and cutting-edge A.I enable industry-leading obstacle avoidance and tracking features.



Select between 4 preset shots with AutoFrame and Hover 2 will fly into position, frame, and capture the shot for you with the tap of a button. Choose between Waist-Up, Full-body, Backdrop, and Birds-eye.

Omni-Follow keeps you in the frame from any angle, allowing more freedom in movement and creativity. Hover 2 can follow from the front, back, side, or switch between all three in the same shot.

Optical Radar, focuses on the direction of movement. Hover 2 can avoid obstacles even while flying sideways or backwards. Major leaps in tracking algorithms can now lock onto unique characteristics to provide perpetual tracking precision and stability.

Pivot follow keeps the Hover 2 stationary as the camera tracks your movements to keep you in the center of the frame.

TrackShot flight paths are inspired by classic film techniques for you to capture videos of you and your friends with cinematic flair.

Hover 2's proprietary Optical Radar is a swiveling stereo sensor that gives the drone depth perception in every direction.

Combined with SLAM 3D mapping, VIO (Visual Inertial Odometry), and path planning features, the drone can navigate new environments with 360º obstacle avoidance and bypass obstacles while tracking a target in real time.

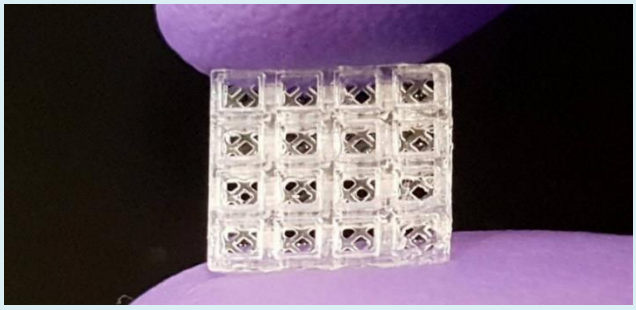
Reference:

www. beebom.com

B.Manasa
ECE-A 3rd Year

LEGO-Inspired Bone With Tiny, 3D Printed Bricks

These tiny, 3-D-printed bricks have been designed to heal broken bones and could one day lead to lab-made organs for human transplant. Inspired by Lego blocks, the small, hollow bricks, typically made of biocompatible polymers. They have created tiny hollow 3D-printed polymer blocks (aka micro cages), that can be stacked together like Lego in order to build bio-scaffolding implants of the desired shapes and sizes. This is usually either 3D-printed in one solid piece, or injected in the form of a gel that sets into a solid. Once it's in place within a bone injury site, the adjacent bone cells migrate into the scaffolding, essentially "roosting" within its three-dimensional microstructure. Those cells then reproduce, gradually replacing the polymer as it harmlessly biodegrades. Eventually, all that's left is pure, natural bone.



Making the implants in this fashion is considerably faster and simpler than 3D printing them in a single custom-size piece.

Additionally, unlike the case with gel-based bio-scaffolding, different blocks can be filled with different types of growth factors. "The 3D-printed micro cages can be filled with ingredients precisely where you want them to go, and then stacked like Lego blocks to result in the desired configuration and distribution of ingredients three dimensionally, Bertassoni tells us. "Consequently, this creates an instructive scaffold, where cells can be guided exactly to the location of interest. This is very important, since a huge bottleneck in the field is, for instance, to get blood vessels in the core of the regenerated tissue before more tissue can form In fact, in lab tests performed on rats with bone injuries, it was found that implants

made from the blocks stimulated about three times more blood vessel growth than traditional bio-scaffolding materials.

Smart Firmer identifies any irregularities along the furrow, such as soil clods, air space, and dry soil falling from the surface, which can be rectified through correct row unit performance, measures the quantity of in-furrow residue and adjust row cleaners ensuring the diseases are not transmitted.

Reference:

https://newatlas.com/medical/lego-inspired-bioscaffolding/

K. Pravallika
CSE 3rd Year

Brain Computer Interface

Neural-link is a neuroethology company that is building a tool to link human brains with computers without the need for a physical connection. The company, formed by none other than Elon Musk, hopes to create a new way of interfacing with technology, in the not-too-distant future.

This is hoped to work by implanting tiny electrodes into the patient's brain and is done with the aim of linking human brains with computers without the need for any other physical connection. Such a huge step towards future!!

It could even replace your television, streaming content straight into your brain!

Of course, these kinds of functionality are still nowhere near being achieved, but the potential for the technology is immense. Who knows, we may even be able to download 'skills' in the future much like '*Neo in the Matrix*'. !! The Maniac might one day become a reality!!

Amidst the present pandemic situations, the technological advancement can help us turn responsible and acquainted for the upcoming years!!

SHIVANI JAGANNATHAM
IT-B 2nd Year

Edge Computing on Aero farms

Aero farms is to grow the best plants possible for the betterment of humanity, while conserving natural resources. vertical farming-where plants and produce are stacked vertically in layers combines horticulture with data science to grow crops indoors.

Recently a company in New Jersey cultivates short-term leafy greens and herbs in tightly controlled indoor environment without sunlight,soil or pesticides which produces 390 times more productive than field farming while using 95% less water.

Each plant is equipped with an IoT-enabled sensor. pairing the IoT sensors with machine learning and Dell Edge Gateways. IoT sensor tracks how much water it consumes, its nutrient density and how ready it is to be harvested.

Temperature, water and lighting are adjusted automatically so Areofarm teams know exactly when to pick the vegetables for maximum flavour, nutrition and freshness and thus avoid spoilage and waste.

Using edge gateways ,we are able to wirelessly monitor all the inputs and control systems and pump that data into cloud for analytics .The gateway is basically the bridge to their control systems and all the sensors in Aerofarm . Aerofarm edge computing deployment monitors water and lighting in vertical farming.

Reference:
internetofthingsagenda-techtarget.com

G.Madhuri
CSE-A 3rd Year

WE WALK-A Smarter Cane

Kursat Ceylan co-developed the WeWALK— a smart cane that detects objects above chest level and pairs with apps , such as Google Maps — to help the 250 million visually impaired and blind people worldwide navigate a digital world without having to juggle a smartphone . The WeWALK costs $499.

WeWALK, the device is equipped with built-in speakers' smart phone integration, and sensors that send vibrations to warn users of obstacles up ahead. The WeWalk cane consists of an electronic handle with a regular 'analog' white cane that is inserted into the bottom. It uses an ultrasonic sensor to detect any obstacles above chest level and warns the user via a vibrating handle. In this way Smart cane helps visually impaired people to walk without any fear.

Thus technology has bought the "BEGINNING OF THE END" of all human problems.

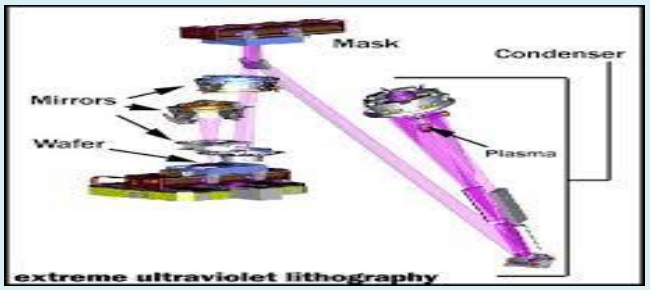
Reference:
https://time.com/collection/best-inventions-2019/5733049/wewalk/

V.UDAYINI
EEE 3rd Year

Extreme Ultra Violet Lithography

EUV (Extreme Ultraviolet) lithography uses an EUV light of the extremely short wavelength of 13.5 nm. It allows exposure of fine circuit patterns with a half-pitch below 20 nm that cannot be exposed by the conventional optical lithography using an ArF excimer laser.1) Putting it into practical use requires a variety of element technologies, including the light source, optics, masks, photoresist, and lithography tools.

Extreme ultraviolet (EUV) lithography is considered to be the most promising technology for meeting the lithographic challenges posed by the next generation semiconductor design rule beyond a half pitch (hp) of 22 nm.



Deep-ultraviolet lithography uses a wavelength of 240 nano meters As chipmakers reduce to smaller wavelengths, they will need a new chip making technology. Hence more and more transistors can be packed into the chip. The result is that using EUV lithography, we can make chips that are up to 100 times faster than today's chips with similar increase in storage capacity. Lithography is the most challenging technology in the semiconductor industry

In many respects, EUVL may be viewed as a natural extension of optical projection lithography since it uses short wavelength radiation (light) to carry out projection imaging.

EUVL ADVANTAGES

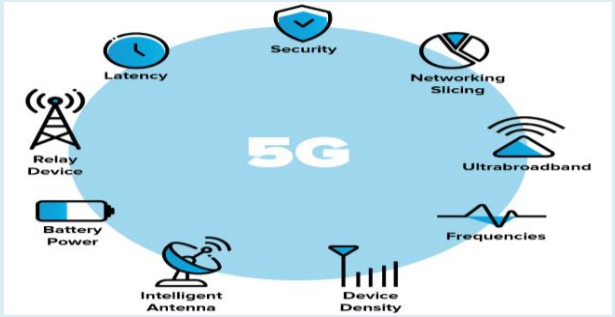
1. EUVL leverages much of the learning and supplier infrastructure established for conventional lithography.
2. The robust4X masks are patterned using standard mask writing and repair tools and similar inspection methods can be used as for conventional optical masks.

M. Sushmita
ECE-A 3rd Year

5G Internet of Things

The evolving of fifth generation networks is becoming more readily available as a major driver of the growth of IoT applications. According to the International Data Corporation report, the global 5G services will drive seventy percent of the companies to spend 1.2 billion dollars on the connectivity of management solution. New business and applications models in the future IoT require new performance criteria such a as massive connectivity, security, coverage of wireless communication, ultra-low throughput for huge number of International Data Corporation devices.

The development of 5G will be based on the foundation created by 4G LTE, which will provide user voice, data, Internet. The 5G will significantly increase the capacity and speed to provide reliable and speedy connectivity to the future IoT. The wireless technologies have significantly enhanced the deployment of IoT, a number open standard for IoT have been released, such as the Vodafone's Cellular IoT.



Massive Machine Type Communication is a communication paradigm where a number of devices are attached to the Internet or directly

connected and communicate with each other with little or without human intervention. In the 5G era, new applications for MTCs are developed to serve a huge number of things, introducing the so-called massive MTC, or massive Internet of Things.5G will be able to sustainably satisfy the requirement of the 1000-time traffic growth.

5G will provide users with fibre-like access data rate and "zero" latency user experience.5G will be capable of connecting 100 billion devices. 5G will be able to deliver a consistent experience across a variety of scenarios including the cases of ultra-high traffic volume density, ultra-high connection density, and ultra-high mobility.

Reference:

https://www.hindawi.com/journals/cje/2016/5974586/

K.V. HIMA BINDU
IT-B 2nd Year

Heart Monitoring T- Shirt

"A cardiologist will never diagnose a heart attack without seeing a full 12-lead ECG"

Smart-digital hWear shirt has conductive fibers woven in, performing the job of an ECG machine and transmitting vitals to your doctor's smartphone. A novel electrocardiogram device built into a shirt could cut precious time off

confirming a cardiac event needing immediate intervention. The fully washable hWear shirt is interwoven with a mixture of high-tech nylon threads and conducting fibers placed in the same locations where the 12-15 leads of an ECG machine would be attached to the body.

ECG signals collected passively by the textile sensors are constantly analyzed for cardiac events such as arrhythmias and ischemia, via medical devices such as a Holter monitor or a Bluetooth unit snapped onto the side of the shirt.

An alert to the patient's and doctor's smartphone is automatically generated if any of these are detected or if the wearer falls or is immobile for an unusual amount of time. It depict the ECG leads graphically to make a fun and interest-catching garment that also happens to be anti-bacterial due to the conductive silver and polymers woven inside.

Reference:

https://www.hometextilestoday.com/industry-news/smart-textile-company-launches-heart-monitoring-t-shirt/

Kavya Swamy
EEE 3rd Year

DORMIO: A Targeted Dream Incubation Device

Researchers from Massachusetts Institute of Technology created a dream incubation device which can control people's dreams through an app.

In recent years scientists have been experimenting with dream control and have known about lucid dreaming. The device created lately is mainly aimed to manipulate dreams to impact emotion ,memory and creativity. It can trigger targeted dream themes and experiences during the fluid first stage of sleep. An enhanced Dormio device, as well as an analysis platform, streaming platform, an iOS app for audio capture and streaming, and a web app for audio capture, storage, and streaming.


These mobile and online platforms allow the TDI method to be shared through a variety of open source technologies. The DORMIO device worn on the wrist like a sensor laden glove. As a person falls asleep wearing the device audio cues(something like signals) are played through the app. The sensors on the glove look out for physiological data signalling the person has fallen sleep and prompt them to say what was going through their mind as they slept with verbal dream report recorded by app.
This device helps shape people's dreams and could be used for various learning techniques involving sleep-based memory consolidation – or as a tool to help creativity and problem-solving, by prompting people to consciously recall.

Reference:
http://news.mit.edu/2020/targeted-dream-incubation-dormio-mit-media-lab-0721

A. Laasya
ECE-B 3rd Year

Smart Kitchen-IOT

After a long time I'm back home and astonished for a minute because of the change my mom created in the kitchen.. Wonder What…..!? Umm…Ok good Right ?.. Now let me take you to a "Smart Kitchen" trip..
Now the smart Phone technology is gaining stream, our kitchen is the one room you shouldn't have reservations about connecting to your network. It doesn't matter if you're a college kid who relies on the microwave, or a professional chef who wants to precisely control the temperature of your sous wide, everyone can find a smart kitchen appliance that makes mealtime a little easier IOT innovations of 2020 are adorable and they made way to this smart kitchen. Like a smart shopping which has a connectivity with Alexa, and which leaves texts to other family members. A smart Crock-pot, you can control wherever you are. Perhaps, you're driving from work, and you want to warm bowl of goodness to greet you when you home. A smart oven for perfect Homemade Pizzas, Every time. A smart Blender preloaded with Recipes, which gives you the accurate carbs, fat and protein content of your drink. A thermometer that keeps an eye on your dish for you. A smart weighing scale for precise measurements and many like these.

Imagine how surprising it is, when the technology you studies is helping you in every step of your life. IOT created this magical innovations, life is easier when you try to look at thing very positively.

Aditi Kiran Porika
IT-B 2nd Year

"Mistakes are proof that you are trying."

Prosthetic Arm

The implant system for the arm prosthesis is called e-OPRA and is based on the OPRA implant system created by Integrum AB. The implant system anchors the prosthesis to the skeleton in the stump of the amputated limb, through a process called Osseo integration (Osseo = bone). Electrodes are implanted in muscles and nerves inside the amputation stump, and the e-OPRA system sends signals in both directions between the prosthesis and the brain, just like in a biological arm. The prosthesis is mind-controlled, via the electrical muscle and nerve signals sent through the arm stump and captured by the electrodes. The signals are passed into the implant, which goes through the skin and connects to the prosthesis. The signals are then interpreted by an embedded control system developed by the researchers. The control system is small enough to fit inside the prosthesis and it processes the signals using sophisticated artificial intelligence algorithms, resulting in control signals for the prosthetic hand's movements.

The touch sensations arise from force sensors in the prosthetic thumb. The signals from the sensors are converted by the control system in the prosthesis into electrical signals which are sent to stimulate a nerve in the arm stump. The nerve leads to the brain, which then perceives the pressure levels against the hand. People who lose an arm or leg often experience phantom sensations, as if the missing body part remains although not physically present. When the force sensors in the prosthetic thumb react, the patients in the study feel that the sensation comes from their phantom hand. Precisely where on the phantom hand varies between patients, depending on which nerves in the stump receive the signals. The lowest level of pressure can be compared to touching the skin with the tip of a pencil. As the pressure increases, the feeling becomes stronger and increasingly "electric".

Reference:

https://www.technologynetworks.com/neuroscience/news/whats-everyday-life-like-with-a-mind-controlled-prosthetic-arm-334219

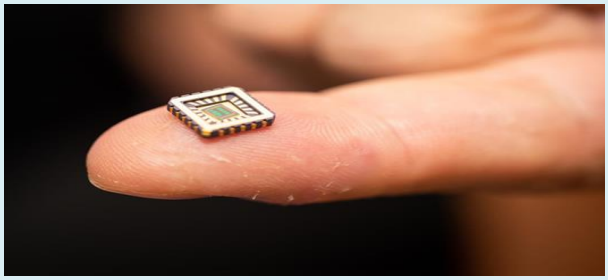
S. Roshitha
EEE 3rd Year

Artificial Neurons On Silicons.

Briefly I can say that artificial neuron is a digital construct which simulates the behavior of a biological neuron in the brain .This technology has the potential in treating a wide range of chronic diseases, including neurodegenerative diseases and heart failure .Many Researchers have been attempting to develop artificial neurons for a long time.

Such technology would be extremely useful for everyone in a wide variety of diseases and conditions. For instance, artificial neurons could be used to replace damaged neurons, such as those in spinal cord injuries etc…

World's first Artificial neurons were developed to cure chronic diseases. More specifically they have constructed Silicon models of neurons. The association has been develop basic techniques to transfer the behaviour of particle neuron into a piece of silicon.



So, basically they have been able to do these things by both mathematical and computational techniques and also in the design of normal chips. The researchers successfully modelled and derived equations to explain how neurons respond to electrical stimuli from other nerves. This is incredibly complicated. This study was funded by a European Union Horizon 2020 Future Emerging Technologies Programme grant and a doctoral studentship funded by the Engineering and Physical Sciences Research Council (ESPRC).

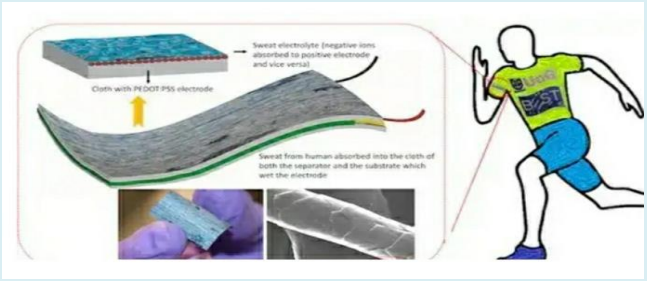
Reference:
https://www.bath.ac.uk/topics/research/

P. Pooja Chaturya
EEE 2nd Year

Sweat powered Wearables

Engineers at the University of Glasgow have developed a new type of flexible super capacitor which stores energy, replacing the electrolytes found in conventional batteries with sweat. It can be fully charged with as little as 20 micro litres of fluid and is robust enough to survive 4000 cycles of the types of flexes and bends it might encounter in use.
This sweat-based flexible super capacitor (SC) for self-powered smart textiles and wearable systems is presented. The developed SC uses sweat as the electrolyte and poly (3, 4-ethylenedioxythiopene) as the active electrode.
The device works by coating polyester cellulose cloth in a thin layer of polymer, which acts as the super capacitors electrode. As the cloth absorbs its wearers sweat, the positive and negative ions in the sweat interact with the polymers surface, creating an electrochemical reaction which generates energy.

On conventional batteries makes them challenging to dispose of safely and potentially harmful in wearable devices, where a broken battery could spill toxic fluids into skin.



They have shown that human sweat provides a real opportunity to do away with those toxic materials entirely, with excellent charging and discharging performance. Also it is safe and sustainable root to meet the power requirements in wearable systems.

Reference:
www.sciencefocus.com

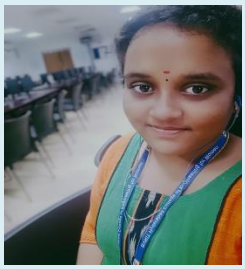
V . Sravya
ECE-B 3rd Year

PIGEONBOT

Aerospace engineers have understood that birds can change the shape of their wings to match various flying patterns, such as takeoff, landing, and turning, but transforming the same into something mechanical isn't easy. Stanford University's Bio-Inspired Research & Design (BIRD) lab leads the project and says that unlocking this key ability in birds will shape the future of drone design. The PigeonBot prototype is called a biohybrid aerial robot because it fuses both biological and artificial elements. They have noticed that when the bird's wrist and finger move all the feathers move too and they do this automatically.

but they learned that some aspects of bird wing motion are simpler than they expected. Using 40 actual pigeon feathers and a super-light frame, they made a simple flying machine that doesn't derive lift from its feathers, it has a propeller on the front. Using a number of flaps, motors, and sensors to build the same model of a bird's sliding feathers in a wing could be dangerous because if one motor or one sensor fails, the rest also fails. But those harder wings are danger to humans when they interact. PigeonBot is the most advanced bird-like robot that's ever been built.

Reference:
https://spectrum.ieee.org/automaton/robotics/drones/pigeonbot-uses-real-feathers-to-explore-how-birds-fly



Akanksha Kacham
ECE-B 2nd Year

Universal-Selector Technology

Spin memory a leading developer of MRAM technologies unveils a new approach: Universal selector. The need of efficient memory in the evolution of technology Industry like AI, VR and IOT has been rapidly increasing. The one stop solution to all the memory related problems is by using Universal Selector transistor, it is a new way of designing dynamic random-access memory (DRAM), magneto resistive random-access memory (MRAM), Resistive RAM (ReRAM) and other emerging memory technologies.
Spin Memory claims that 'Universal Selector' can uplift array densities of DRAM array by 20-35 percent and MRAM by five times. Spin Memory's Universal Selector is a selective, vertical epitaxial cell transistor whose channel has a low enough doping concentration and it operates in full depletion. This completely eliminates the possibility of any trapped or migrating electrons causing a row hammer, making this design row hammer-immune. Also Solving leading issues such as Row-Hammer issues, reducing Soft Error Rates (SER) and leakage. This means higher levels of performance , credibility and density than ever before which will boost innovation to levels above that expected by Moore's law This is a huge leap for large scale development of the Technology Industry and also cost efficient which will bring about $100 billion in semiconductor products .

Reference:
https://blocksandfiles.com/2020/08/12/spin-memory-universal-selector/

R.Anusha
EEE 3rd Year

Floating Farms

Farmers are the backbone of our society. They are the ones who provide us all the food that we eat. As a result, the entire population of the country depends upon farmers. Be it the smallest or the largest country. Because of them only we are able to live on the planet. Thus Farmers are the most important people in the world. Though farmers have so much importance still they do not have proper living.

The smart Floating Farms will help us to reduce communities/growing cities food risk associated problems, make food production more transparent, using clean energy to produce fresh food closer to home.

The roof top is built with the Solar energy plant (roof top) view of a 60x35 meter module (2100 sqm footprint -22604 sqft). In middle Hydroponics-crop production (middle level) different crop types -80% less water consumption. In lower level Aquaculture-fish and other species (lower level)- commercial recirculating aquaculture system.

This is a base of aquatic weeds on which vegetables can be grown. The **gardens float** on flooded land or small ponds. They can be used all year round, for summer and winter crops, and can provide families with enough vegetables to eat and to sell.

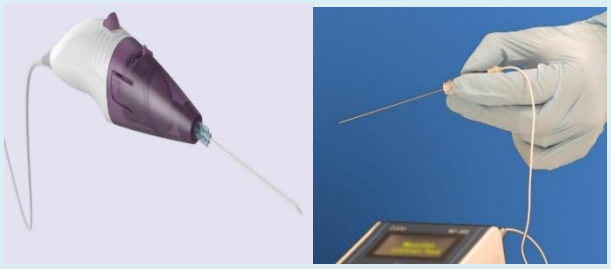
The farmers opinion towards floating agriculture as a means of cleaner production. The framers should be provided with different type of need-based training related to floating agriculture. By developing this **INDIA** becomes number one in the world.

Reference:
https://www.indiawaterportal.org/articles/

Gugulothu Himabindu
IT-A 2nd Year

Smart Needles – Cancer Detecting needles.

Identifying cancer can be made easy by using a '**SMART NEEDLE'.** A 'smart needle' has been developed by scientists in the UK which could speed up cancer detection and diagnosis times. This optical biopsy uses a technique called Raman spectroscopy, which measures the light scattered by tissues when a low-power laser is shone onto it. Light is scattered differently from healthy or diseased tissues, meaning that health professionals are able to detect whether there are concerns within seconds.



This new technique could significantly improve the rate of detection and diagnosis of cancers, and particularly lymphoma (a cancer of the immune system) – the sixth most common cancer.

"The Raman smart needle can measure the molecular changes associated with disease in tissues and cells at the end of the needle. Provided we can reach a lump or bump of interest with the needle tip, we should be able to assess if it is healthy or not."

early diagnosis can be a key factor in providing effective treatment, current methods can be both invasive and time-consuming, leaving patients anxiously awaiting results which are overcome in Smart Needle

Reference:
https://medicalxpress.com/news/2019-11-smart-needle-revolutionize-cancer-diagnosis.html

K.Sai Manasa
ECE-B 3rd Year

"Intelligence without ambition is a bird without wings."

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