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BVRIT HYDERABAD
College of Engineering for Women

ACCREDITED BY NAAC WITH GRADE : A | ACCREDITED BY NBA FOR 3 YEARS | NIRF 2021 Rank-Band : 201 - 250

B - SMART

WE EXPLORE WE EXHIBIT

Name to Fame
Hackathon Stories
Technical Trends

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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

"Success is not an accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do." Pele

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

BVRIT HYDERABAD College of Engineering for Women encourages students to excel in the areas of their interest, with the constant support from Management, Faculty & Staff. Our students are motivated to deliver the best in their field. And…the elements which create success, naturally follow!!! With the hard work and dedication of its employees and students and with the motivation of its visionary management, our college continues to be in the light of excellence. The college has returned to its colourful days with the students attending the college in physical mode, still maintaining COVID protocols. With the hope of having a pandemic free world soon, we welcome all to the 12th edition of BSMART, the Technical Magazine of BVRITH.

Our score in Graduation Outcomes (which is the reflection of the academic and employability status of students) is one of the best in JNTU, Hyderabad. Our students benefit from enriched faculty and a strong Placement Cell that works with individual students throughout the year. Our students were able to clinch 533 offers from 55 national and international companies. Our NSS is engaged in activities that create social responsibility awareness among the students.

In BSMART, we showcase the students' achievements in cover stories. Even in between the University exams which they had to face at a time together, the students had the mind to participate in different events and win prizes. We have 5 cover stories this time. The article appreciated by everyone in the last issue is 'Adibot-Disinfecting Robot', contributed by Akanksha Kacham of III ECE.

I congratulate the contributors of articles and the faculty & student coordinators who worked devotedly to give rise to the magazine's new edition.

Stay safe, Stay healthy.

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

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COVER STORIES

COVER STORY – 1

1ST PRIZE WINNERS OF PROJECT EXPO, 2021 WITH CASH PRIZE 1500/-

Kavya. G (17WH1A0246) | Pujitha. B (17WH1A0250) | Jaya Pooja Sri. M (17WH1A0258) | Ruchitha. V (17WH1A0259)

Title :

WEB APPLICATION FOR SOLAR DATA MONITORING USING IoT TECHNOLOGY

Team Members:

Ms. Kavya. G

Ms. Poojitha. B

Ms. Jaya Pooja Sri. M

Ms. Ruchitha.V

Mentor:

Mrs. B. Sujatha,

Associate Professor,

EEE Department

We, the EEE – IV Students of BVRIT HYDERABAD College of Engineering for Women participated in Project Expo conducted by Annamacharya Institute of Technology & Sciences, Rajampet in virtual mode. The Problem statement is to implement web application for solar data monitoring using IoT technology for monitoring the past and present solar data according to the user requirements and to reduce the cost of energy consumption by providing notification to the user. The project has been developed by using Solar panel which absorbs sunlight and converts into electricity. The data which is generating near solar panel is collected by using current & voltage sensor and this data is transferred to Arduino Micro controller for the computation of the energy consumption. The computed information is transferred to the Ethernet Shield server and code was written in such a way that, at the same time this data will be stored in Firebase. User Interface is developed in such a way that it will retrieve the data which is stored in firebase according to the user requirements. Now, user interfaces display real-time data after the execution of User Interface. If user wants to view the historic data, then user needs to enter specific date and time from the past so that User interface will display the past data. We developed User interface in such a way that if user fails to enter either of the two fields then it will show warning like 'Please fill out this field'.

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

COVER STORY – 2

1ST PRIZE WINNERS OF TECHNICAL EVENTS (Seminar & PPT Presentation) WITH CERTIFICATE AND MEMENTO CII YICA 2020

Title :

ENERGY MANAGEMENT SYSTEM OF A MICROGRID USING MULTI AGENT SYSTEM

Team Members:

Ms. S.K. Chandini

Ms. K. Shivani

(3rd YEAR EEE)

Mentor:

Mrs. B. SUJATHA,

Associate Professor,

EEE Department

We, 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 had presented about the topic Energy management system of a Microgrid using Multi Agent Systems. The presentation's main goal is to conserve energy by utilizing renewable energy sources such as heat, water and other forms of energy. Microgrids are a new model for the evolution of the distribution system that are both efficient and cost-effective. The architecture of any power system's control and communication is critical. Supervisory Control and Data Acquisition Systems (SCADA) are used in conventional power systems to accomplish this. The intermittent behaviour of distributed energy resources reflects uncertainty in SCADA systems as sensor data cannot be interpreted. Energy Management System plays a vital role in microgrids which is a system of computer-aided tools used by operators of electrical utility grids to monitor, control and optimize the performance of generation system. Due to the multiple interacting agents in Multi-agent systems can mitigate challenges better than SCADA systems. MAS are more successful in controlling the distributed energy resources due to reliable communication and organized structure. MAS may be forced to make autonomous decisions such as smooth grid-to-island transitions, load-shedding, and protecting essential loads, among other things.

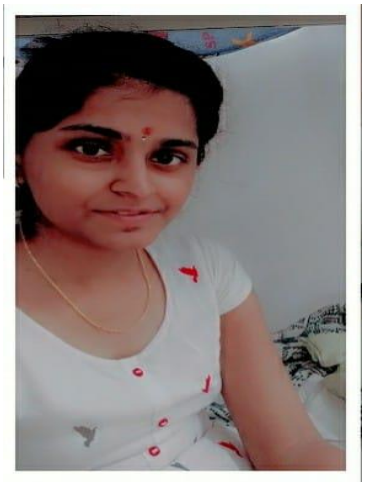
"Two wrongs do not make a right."

COVER STORY -3

2ND POSITION IN ATM-21P

Title :

IMPLEMENTATION AND DESIGN OF HYBRID ENERGY STORAGE DC MICROGRID APPLICATION



We, the students of EEE-III of BVRIT HYDERABAD College of Engineering for Women participated in ATM-21 (Annamacharya Talent Meet), a National level Technical Online Symposium. Our presentation is about stabilising the energy in the DC microgrid. We are stabilizing the energy by using battery and super capacitor connected through Bidirectional DC-DC converter. In hospitals, during emergency situations, there is huge demand for power. Due to this there are power fluctuations. In HESS system we store the energy in battery and supercapacitor when there is excess amount of power supply. This stored energy is utilized when there is a demand for power. If there is insufficient energy at the supply then battery and supercapacitors discharge energy and will supply it to source. This application will be helpful when the power demand is more.

Team Members:

Ms.M.Vasavi Chowdary

Ms.A.Bhuvaneshwari

(3rd YEAR EEE)

Mentor:

Dr. P. Srinivas

(Assistant Professor)

Ms. B. Sujatha

(Associate Professor)

EEE Department

"Just remember, you can't climb the ladder of success with your hands in your pockets."

COVER STORY-4

2ND RUNNER UP IN ML BUILD-A-THON BY TASK ORACLE ACADEMY

Title:

LOAN ELIGIBILTY PREDICTION

Team Members:

Ms. Posani Joshita

(Individual Project)

(4th Year CSE)

Mentor:

Ms.Jagadeeswari,

Assistant Professor

CSE Department

I, Joshita, is a CSE Student of BVRIT HYDERABAD College of Engineering for Women. I had participated in the TASK ML Build-A-Thon organized by TASK in collaboration with Oracle Academy and Smart Bridge. It was an excellent learning experience, a great opportunity to learn from industry experts. The insights on new technologies from the experts and the interactive learning helped me to get exposed to the higher level of thinking.

I secured the 2nd runner-up position in the TASK ML Build-A-Thon. It started off with a three days boot camp where we were taught the Machine learning concepts by the industry experts. This was followed by a Project phase where we were given 10 days to build a machine learning project from the concepts that we learnt in the boot camp. They gave us few project titles to choose from and I chose Loan Eligibility Prediction. After the completion of the project, I uploaded it on GitHub and submitted the link to them. After a week, the top 15 students were selected for the next round. In this round, I had to explain my approach and idea to the panel consisting of industry experts. A week after that the results were announced on 24th May.

"Put your heart, mind, and soul into even your smallest acts. This is the secret of success."

COVER STORY-5

1ST RUNNER UP IN

INNOVESTA - 2021

Title:

LEAF DISEASE DETECTION

Team Members:

Ms. K. Sai Uma

Ms. R.Supriya

Ms. O.Shanitha

(3rd Year ECE)

Mentor:

Mr. N. M. Sai Krishna

Assistant Professor,

ECE Dept

We the 3rd year ECE A Students of BVRIT HYDERABAD College of Engineering for Women participated and stood as First-Runner Up in the National Level Competition Organized by NIT Jalandhar, Punjab, India.

On 25th and 26th September, Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, organized INNOVESTA-2021. Participants were asked to give a presentation on their idea in 7 minutes and 5 minutes for the Questionnaire. There were about 100 teams across the country shortlisted for the final presentation.

We were not certain about our presentation and aimed to make it simpler and easy to explain. Meanwhile, our time slot has been preponed and made all of us a little nervous.

We described our project on Leaf Disease Detection and the amount of pesticide prediction using Raspberry Pi. Finally, with the inputs given by our mentor Sai Krishna Sir, we were able to answer the Questionnaire confidently.

We learned to step forward and make quick changes to the situation.

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

“Study to learn, do not study to pass.”

TECHNICAL TRENDS

Is microservices architecture the future of enterprise applications?

Microservices is a new architectural style that emerged from the concept of Service Oriented Architecture (SOA) with independent design and deployment as its key features. Microservices has become the buzzword in IT, and most of the large IT firms, such as Amazon, Netflix, Twitter, etc., have started designing their new applications using this new style. Few more companies, such as Uber, Google, Elsevier, Paypal, etc., have migrated their existing legacy applications to microservices. Microservices is best defined by Martin Fowler as:

"A particular way of designing software applications as suites of independently deployable services. While there is no precise definition of this architectural style, there are certain common characteristics around organization around business capability, automated deployment, intelligence in the endpoints, and decentralized control of languages and data."

Success Stories of Microservices

1. Netflix was one of the earliest adopters of microservices. It has 500+ microservices and API Gateways that handle over 2 Billion API edge requests daily. Netflix engineers deploy code thousands of times per day. Today Netflix services 93.8 million users globally, streaming more than ten billion hours of movies and shows.
2. Amazon provides infrastructure for microservices through Amazon Web Services (AWS), and Amazon engineers deploy code every 11.7 seconds.
3. Spotify has 810 services, supports scale to millions of users.
4. When **Elsevier** integrated Mendeley, the application became large monolith. They migrated to microservices architecture, and Mendeley receives 20 million requests a day.
5. Coca-Cola's Global IT group faced a big challenge of connecting all the entities on different continents and supporting their growth. They decided to leverage microservices using the Dev-Ops model and GIT. Coca-Cola said they could reduce data flow to their networks by 50%, and the time required to scale up to support went down from weeks to minutes.

Forces in using Microservices

1. New team members must quickly become productive.
2. The application must be easy to understand and modify.
3. You want to practice continuous deployment of the application.
4. You must run multiple instances of the application on multiple machines in order to satisfy scalability and availability requirements.
5. You want to take advantage of emerging technologies (frameworks, programming languages, etc.)

Future of Microservices

1. By 2025, 86% of developers internationally expect it to become the default application architecture.
2. 63% of enterprise applications will adopt this microservices style.
3. The Healthcare microservices market alone is expected to increase from $130 million to $519 million by 2025.

Challenges in Microservices

Though microservices are widely being used in many large IT giants, still it exhibits many design challenges. These issues arise because of not
understanding the complete architectural properties of microservices.

1. *Complex Communication:*
increased interconnections and interdependencies raise complexity and the chance of mismanagement.

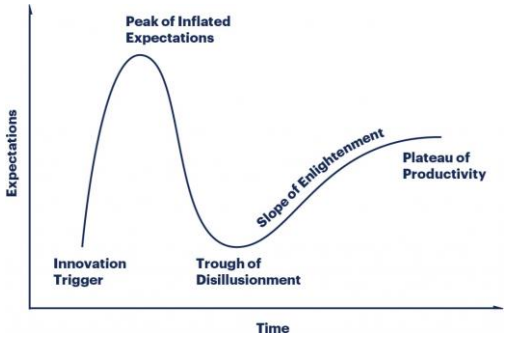
2.*Independence:*
The same independence which acts as an advantage is also a disadvantage. As each service has its own database and transaction management, data consistency becomes difficult.

3.*Security:*
Increased inter-service communication results in a security threat for a network hack.

4.*Distributed systems complexity*:
Overall System latency is higher, Network failure or Individual Node failure can bring the whole system down, Operational complexities are higher.

Final Remarks

According to Gartner, a technology or application will evolve over time, providing a sound source of insight to manage its deployment within the context of your specific business goals. Hence, as microservices is a new style of designing enterprise applications, it will be in great demand for certain period and later it will evolve with its actual design properties.



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4. Jamshidi P, Pahl C, Mendonça NC, Lewis J, Tilkov S. Microservices: The journey so far and challenges ahead. IEEE Software. 2018 May 4;35(3):24-35.

Dr. Vinay Raj
Assistant Professor
Department of CSE

Mobile App Development Trends

Ever since smartphones entered the technology scene, there was no turning back. Everything that happened afterward was beyond anybody's wildest imaginations. Within a blink, smartphones have become our constant companion. Many technologies made their way into our lives.

Due to this phenomena, more mobile app development trends also started emerging and materializing along the way.Both users and app developers hit the jackpot in this scenario. Ultimately an effective app development strategy involves more than just technologies and trends.

Below are some of the future trends to watch out for in the app development space:

"Overconfidence will drown you in the sea of reality."

1) Integration of Internet of Things and Cloud

Not only our home or office, in the future, but we can also control almost everything by using IoT systems. IoT products like Amazon

Dash button, Philips lighting system, August doorbell cam, August smart lock, etc. are already winning users over.

Many business organizations are quickly shifting their gear into IoT app development. IoT devices will be as ubiquitous as smartphones. IoT and Cloud-enabled mobile applications are going to become a key trend in the coming years because of their capabilities to handle redundant data and
connecting multiple devices on a real-time basis.

In the future, apps need to be more advanced. They will need to speak to you, in the same way, devices built on IoT communicate. The cloud's ability to connect many things with APIs will also be essential in the future of mobile application development.

2) Cross-Platform Development for Future Apps

We have seen mobile app development shift towards cross-platform technology since the last few years. Trusted and big names in the mobile app industry like Facebook, Pinterest, Alibaba, etc. have successfully implemented this technology to improve their efficiency. The numerous benefits of cross platform app development like cost-effectiveness, high performance, faster development, etc., will technology.

Some of the other mobile app development frameworks used by mobile app developers to build hybrid or cross-platform applications are React Native, Xamarin, Ionic, etc.

3) Artificial Intelligence in Future Mobile Apps

What comes to your mind when you hear artificial intelligence on smartphones?You'll say Virtual assistants (Siri, Google Assistants, Replica, etc.) and chatbots. Or more recently AI-based photo filtering apps like Face App, Prisma,
etc.. People use mobile devices for various purposes, like gaming, entertainment, etc. And expect a high level of features such as navigation, speech recognition, and natural language processing. Artificial Intelligence, in the future for all the apps, has almost everything.

In the future, most AI apps will be developed using technologies such as predictive analytics and machine learning algorithms. This will allow mobile app developers to deliver a more personalized experience in their applications, and apps will be able to perform functions such as analysing the user behavior and alert them about any suspicious threats and breaches of information

4) Role of AR and VR in the Future Mobile App Industry

According to Statista, the AR/VR market is forecasted to reach **$209 billion** in 2022. In 2020 the mobile app development industry is aware of Virtual Reality (VR) and Augmented Reality (AR). These technologies will become very advanced and will be part of the great revolution in developing gaming and entertainment mobile apps.There are various VR-based games and applications developed like Pokemon Go, Sky Siege, iOnRoad, Google Cardboard, Samsung Gear VR, and much more

become a show stopper in the global gaming and entertainment industry.

The way app development is flourishing is similar to the idea that traditional technologies have in the past. We can learn from past references to predict the future of mobile app development or what's yet to come. We can say that the future of app development will look bright and vastly different from contemporary technologies. This
will make developers and businesses to do well in the future by providing quality and unique solutions to the users.
Billions of apps are available on play store, app store, and on many other platforms. To make your app stand-alone and unique, these technologies can be used.

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3. https://buildfire.com/mobile-app-development-trends/

Ms. S. Ramadevi,
Associate Professor,
Department of IT

Modelling of a Double-Input Bidirectional DC-DC Converter for HESS and Unified Controller Design for DC Microgrid Applications

Due to high penetration of renewable energy sources in DC microgrids, these microgrids are highly susceptible to fluctuations in power generation. This is harmful so long voltage stability is considered. To absorb these fluctuations within, a hybrid energy storage system (HESS) consisting of battery and supercapacitor (SC) is used. The contrasting characteristics of battery and supercapacitors make them a perfect combination for HESS applications. The HESS is interfaced to DC microgrid using a double-input bidirectional converter.

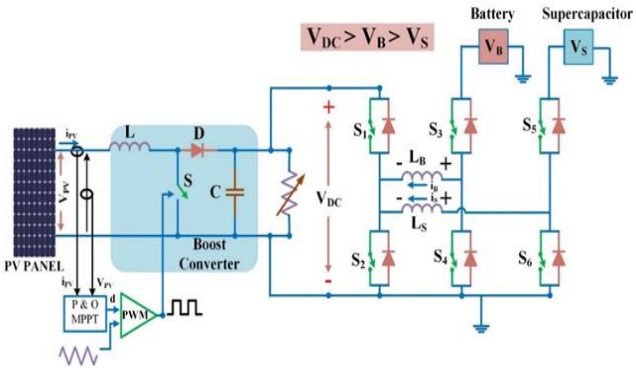


Fig. 1. DC microgrid setup powered by PV source and supplemented by HESS

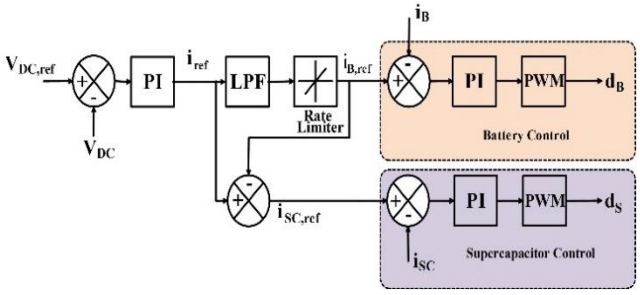


Fig. 2 Overall Control logic for HESS

This bidirectional converter not only provide decoupled control of battery and supercapacitor power but also provide energy exchange between the storage components within. This

paper presents a converter modelling method for the double-input bidirectional converter.

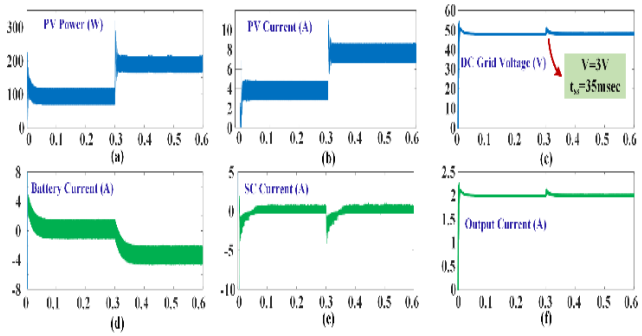


Fig. 3 Step Change in PV generation

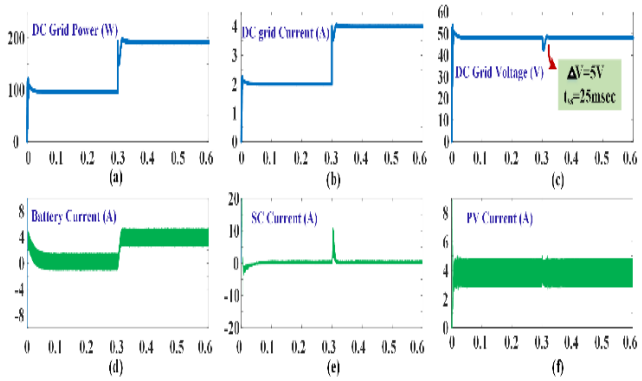


Fig. 4 Step Change in Load demand

Reference:

Punna Srinivas, Udaya Bhasker Manthati and Arunkumar C R "Modelling, Analysis and Control of a Two-Input Bidirectional DC-DC Converter for HESS in DC Microgrid Applications", International Transaction on Electrical Energy Systems (ITEES-20-0960), Wiley Publications. https://doi.org/10.1002/2050-7038.12774.

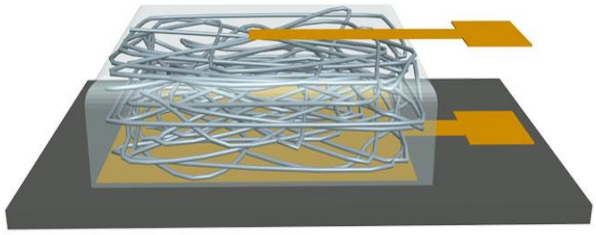
Dr. P. Srinivas
Assistant Professor
Department of EEE

Powering your phone with protein strings of bacteria

- These protein strings can pull electricity out of moist air anywhere.

Jun Yao, an electrical engineer by chance discovered a way to use all-natural protein to turn water into electricity. Geobacter bacteria live in mud, has been used to clean up oil spills and radioactive waste. The nano strands from billions
of bacteria were removed and sandwiched a cloud of the wire like strands between two small, gold metal plates.

The device sandwiches a film of protein nanowires between two gold electrodes.



The protein nanowires created electricity in presence of air's humidity. The device produced electricity at all levels of humidity. Key to the system are small spaces between the nanowires, called nanopores. They allow water to move between the wires. More water collects on the side with the small electrode where the nanowire package contacts the air. Less gathers on the side where the nanowires touch the larger electrode. This difference, or gradient, makes a positive charge build up on one side of the "wires" and a negative charge on the other. It's a bit like how lightning forms, Yao says. "The movement of water molecules creates a charge separation in the cloud," he explains.

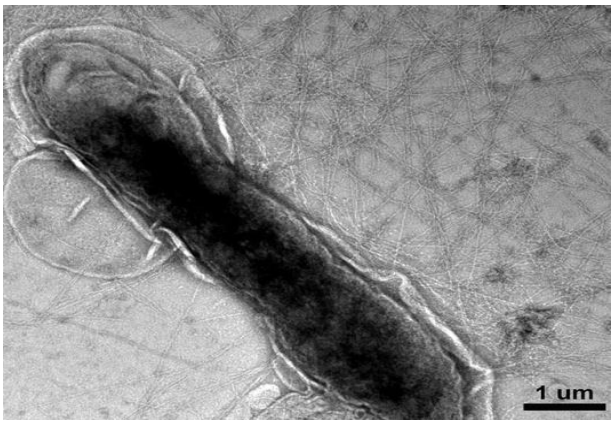
"If people are doubting how far you can go, go so far that you can't hear them anymore."

"Eventually it reaches a threshold so the cloud discharges," producing lightning.

This *Geobacter* bacterium is surrounded by a web of nanowires.

Powering the future?

The new device has the potential to be a major innovation in renewable energy, Yao says. After all, he notes, "humidity is every where."



The devices are very thin and can be stacked. Unlike solar panels, they don't need light or to cover a big area. They can be used indoors or out. They can even become part of furniture, cell phones and more without being noticeable. The best part, Yao says, is that harvesting the microbial wires produces no harmful chemicals. And when the devices are no longer needed, the gold electrodes can be reused or recycled. The nanowires can be tossed out, allowing the protein to break down naturally. This means that unlike other types of renewable energy, Yao says, there's no long-term waste to pollute the environment.

This looks to be an important technology, says Quanbin Dai. He's a nanotechnology researcher who was not involved with the study. He works at Case Western Reserve University in Cleveland, Ohio. Many people have "cell phones and wearable electronics that need to be recharged," he notes. The idea of being able to power these from humid air is appealing, he says. Protein nanowires could make electric power anywhere and at any time of day. "It will be interesting to see the successful implementation of this," he says. Many people have "cell phones and wearable electronics that need to be recharged," he notes. The idea of being able to power these from humid air is appealing, he says. Protein nanowires could make electric power anywhere and at any time of day. "It will be interesting to see the successful implementation of this," he says.

Reference:

Journal: X. Liu et al. Power generation from ambient humidity using protein nanowires. Nature. Vol. 578, February 27, 2020, p. 550. doi: 10.1038/s41586-020-2010-9.

Dr. V. Madhavi,

Associate Professor of Chemistry, BS & H Dept

"I can" is 100 times more important than IQ.

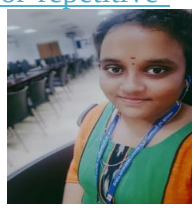
Tesla BOT

Elon Musk, the CEO of Tesla, presented the Tesla BOT, the announcement was made as part of AI Day – August 19th 2021. The robot, code-named "Optimus" is based on the same chips, sensors and uses the same artificial intelligence as Tesla's fleet of self-driving cars.

The 5-foot-8-inch bot will be made from lightweight materials and will weigh 125 pounds. It will have a carrying capacity of 45 pounds and a lifting capacity of 150 pounds. It has a top speed of 5 miles per hour. Its head will be equipped with the autopilot cameras that Tesla vehicles use to sense their surroundings, as well as a screen to show information. It will be controlled inside by Tesla's Full Self-Driving computer. The Tesla Bot would do away with risky, dull, and repetitive labor. As the bot collects, shares, and acts on extremely sensitive information, there are some potential dangers to privacy and autonomy, as well as misalignments between ethical and ideological perspectives. These are issues that are rarely addressed in engineer training, yet failing to address them can result in tragedy.

Reference:

https://www.cnbc.com/2021/08/19/elon-musk-teases-tesla-bot-humanoid-robot-for-repetitive-tasks.html



Akanksha Kacham
ECE-B 3rd Year

5G Technology

5G Wireless stands for 5th generation wireless technology, it's a complete wireless communication system with almost no limits and has an incredible transmission speed, and this turns the world really wireless and is also called as REAL Wireless World. 5G Technology is the next generation of cellular networks and services. It is expected to provide at least 20GBPS downlink and 10GBPS uplink, which will make the 5G network to be at least 40 times faster than current 4G LTE. Currently the market is led by Switzerland, and followed by South Korea and the US.

There various companies who have analyzed the importance and seen the future in 5G and are investing in 5G like Samsung, Huawei, Intel, Deloitte, Nokia, Ericsson, Qualcomm.

OSI Layers 1 and 2 together define the wireless technology, for these two layers the 5G mobile network is likely to be based on Open Wireless Architecture (OWA).

The 5G mobile phone is designed as an open platform on different layers, from physical layer up to the application.

Applications

There are various applications of 5G like wearable devices with AI, VoIP enable devices etc. and are expected to be in markets soon at affordable rates, much reliability.

Advantages:-

- Increased Bandwidth for All Users
- More Bandwidth Means Faster Speed
- New Technology Options May Become available on a 5G Network

Disadvantages:-

• An Increased Bandwidth will mean Less Coverage

• The Radio Frequency may become a problem

Reference:

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Mogullapalli Akshita
CSE-B 3rd Year

XIAOMI SMART GLASSES

Do you remember the Iron Man's glasses? Xiaomi has quietly revealed new wearable product in China, it's their first effort at Smart Glasses. These glasses have a very unique reviving design that plainly took inspiration from Iron Man's EDITH glasses and can make calls, take photos, translate text, show notifications real-time right before your eyes. It also has its own company's XiaoAI assistant which helps the user to interact and navigate. This AI-powered glasses are smart enough to pop up only the most important notifications get through to you.

The technology used in here integrates a total of 497 components. Also, the built-in dual beamforming microphones and speakers help users take calls without accessing their smartphones. Amazingly, the interface is available in Android version and has a very visionary design.

When it comes to the technical details, it consists of quad-core ARM processor, a battery, a touchpad, Wi-Fi, and Bluetooth modules. It also makes use of Micro LEDs for backlighting and measures 2.4mm x 2.02mm in thickness and a tiny 5MP camera. Unfortunately, these glasses are just a "smart device concept," with no shipping date, pricing, or availability.

Reference:

https://blog.mi.com/en/2021/09/14/xiaomi-unveils-xiaomi-smart-glasses/

Meghana Sri Sai.A
ECE – A 3rd Year

Water filtering method

'Water - Water – Water'…

The word which is mostly used in the society, not for its abundance, but for its health. Water Resources are more, but most of them are not fit for usage. Now, Only scarce resource is available, but pure water is very limited. More filtering techniques have been employed like sedimentation, decantation and many more.

A group of scientists at Tufts University School, developed a new technology to detect the drinking water related diseases. By making a biological filtering membrane, which has the

capacity of allowing the passage of ions into and out of the cell. The filtrating membrane is designed by using a zwitterionic polymer which makes the passage narrower for movement of ions.

As this passage is narrower, there is a fast flow of ions into the porous layer, more quantity of water is filtered. The application of this technology could prevent fluoride toxicity in water supplies where the element occurs naturally at levels too high for human consumption. Groundwater has more fluoride content which is dangerous, when people start drinking it.

The filter is simple, cheap which increases water supply in agriculture, chemical production.

Reference:

https://now.tufts.edu/news-releases/new-filtering-method-promises-safer-drinking-water-improved-industrial-production

Sreenidhi Ranganathan
ECE – A 3rd Year

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DELUX SEEKER – ERGONOMIC VERTICAL MOUSE

Delux Seeker is the world's first ergonomical vertical mouse.

Features and Benefits:

1. Multiple device connections
2. 6 customizable buttons and 2-wheel controls
3. Vertical handheld design
4. Detachable magnetic Wrist Rest
5. 3 Connection methods
6. Intuitive parameters display
7. 4 color options
8. Configurable auto-sensing RGB Back Light
9. One key switch

With an innovative vertical handheld design, DELUX Seeker is expertly crafted with an aesthetic curve and honeycomb hollow shell that perfectly fits the hand. A detachable magnetic wrist rest greatly relieves hand and wrist pain that is common with typical mice.

The ergonomic concept is not just the angle and structure; it also lies in every streamlined curve of the mouse body. With an aesthetic curve and well-positioned thumb rest, DELUX Seeker fits the contours of your palm for a comfortable and relaxing grip.

DELUX Seeker supports 3 wired & wireless connection methods compatible with virtually all systems. You can either use the wired cord connection for simplicity and saving the battery or connect wirelessly using USB receiver.

DELUX also works in Bluetooth Mode to connect Bluetooth enabled devices like Windows / Android / Mac OS. With 3 different connection methods, DELUX Seeker supports one-key switching between devices. With the switch button at the bottom, the mouse can switch between multiple devices.

DELUX Seeker is equipped with an optimally-sized detachable magnetic wrist rest in order to give proper support to your wrist and hand while using the mouse.With up to 4000 DPI optical sensor, DELUX Seeker offers high precision mouse control for more accurate tracking!

Reference:
https://www.kickstarter.com/projects/delux/delux-seeker-ergonomic-vertical-mouse-with-customized-button

M. Lekhya Sri
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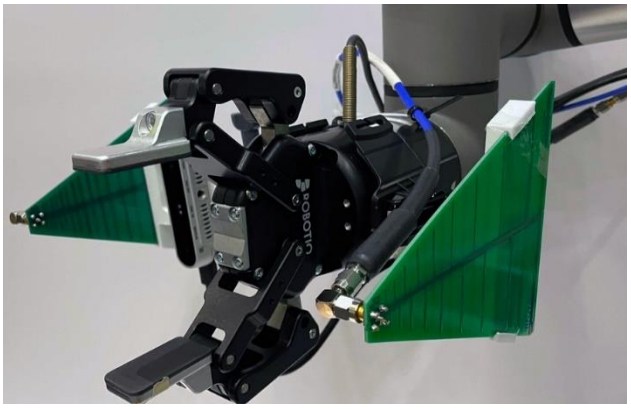
Lost Something? Ask R Fusion

Researchers at MIT have created a robotic system that can find misplaced items, that we usually take hours to find manually. The system, RFusion, is a robotic arm with a camera and radio frequency (RF) antenna attached to its gripper. It fuses signals from the antenna with visual input from the camera to locate and retrieve an item, even if the item is buried under a pile and completely out of view.
The RFusion prototype relies on RFID tags, which are cheap, battery-less tags that can be stuck to an item and reflect signals sent by an antenna. Because RF signals can travel through most surfaces, it is able to locate a tagged item within a pile.



Using machine learning, the robotic arm automatically zeroes-in on the object's exact location, moves the items on top of it, grasps the object, and verifies that it picked up the right thing. The camera, antenna, robotic arm, and AI are fully integrated, so RFusion can work in any environment without requiring a special set up.
In future RFusion can have broader applications like sorting through piles to fulfill orders in a warehouse, identifying and installing components in an auto manufacturing plant, or helping an elderly individual perform daily tasks in the home, though the current prototype isn't quite fast enough yet for these uses.

Reference:
https://news.mit.edu/2021/robot-finds-items-camera-antenna-1005

Bhavya Sri Ande
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Filmatic - Powerful Outdoor Projector

Nike Filmatic is small yet powerful outdoor projector that you could take anywhere. This projector is wireless, waterproof drop resistant and even has a built-in-speaker weighing just

200 grams and it can even fit in our pockets. The combination of a classic, retro, and industrial style created the Filmatic. This tiny projector is perfect for taking on your next camping trip.

It is made with metal components so that it is never be crushed or broken from a fall. It can even adjust edges and tilt the image. The screen size can vary from 120inches to 30 inches making it perfect for all occasions. It is more durable than traditional projectors with plastic casings. Filmatic uses a brand-new structural heat dissipation system. Filmatic powered by DLP technology delivers a sharper, more crisp image with true FHD 1080p resolution. Take the cinema wherever you go.

Reference:
https://www.kickstarter.com/projects/filmatic/filmatic-worlds-smallest-and-powerful-outdoor-projector

T. Shirisha
ECE-A 3rd Year

AI-Driven Dynamic Face Mask

To stay safe in this pandemic situation we have to follow some rules. One of them is wearing a mask. But are you really comfortable?

Wearing a mask at the gym or while exercising in groups has been one of the frustrations of many people especially to those who are suffering with breathing issues.

Don't worry my dear developers, technology is everywhere, now a facial covering has been made using artificial intelligence, which can protect the wearer while remaining breathable.

Researchers have created a way to allow the wearer to increase the amount of air they breathe with a dynamic respirator that modulates its pore size in response to changes in the surrounding environment.

After working up a sweat, the wearer will be able to breathe in more air while high air pollution levels will cause the pores to contract, resulting in increased filtration. The team then placed a stretcher around the filter, which was connected to a lightweight, portable device containing a sensor, an air pump, and a microcontroller. The device communicates wirelessly with an external computer running artificial intelligence (AI) software that reacts to particulate matter in the air as well as changes in the user's breathing patterns during exercise. Two filters were placed on each side of the facemask and tested on human volunteers. The stretcher correctly generated a smaller increase in pore size when the volunteer exercised in a polluted atmosphere than when they exercised in clean air.

Reference :
https://scitechdaily.com/ai-driven-dynamic-face-mask-adapts-to-exercise-and-pollution-levels/

Male Sreeja
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Flying high-speed drones into the unknown with AI

When it comes to exploring complex and unknown environments such as forests, buildings or caves, drones are hard to beat. They are fast, agile and small, and they can carry sensors and payloads virtually everywhere. Autonomous drones can hardly find their way through an unknown environment without a map. For the moment, expert human pilots are needed to release the full potential of drones.

Researchers at the University of Zurich have developed a new approach to autonomously fly quadrotors through unknown environments at high speeds using only on-board sensing and computation.

They trained an autonomous quadrotor to fly through previously unseen environments such as forests, buildings, ruins and trains, keeping speeds of up to 40 km/h and without crashing into trees, walls or other obstacles. All this was achieved relying only on the quadrotor's on-board cameras and computation.

The drone's neural network learned to fly by watching a sort of "simulated expert"—an algorithm that flew a computer-generated drone through a simulated environment full of complex obstacles. At all times, the algorithm had complete information on the state of the quadrotor and readings from its sensors, and could rely on enough time and computational power to always find the best trajectory.

Such a "simulated expert" could not be used outside of simulation, but its data were used to teach the neural network how to predict the best trajectory based only on the data from the sensors. This is a considerable advantage over existing systems, which first use sensor data to create a map of the environment and then plan trajectories within the map—two steps that require time and make it impossible to fly at high-speeds.

According to the researchers, the next steps will be to make the drone improve from experience, as well as to develop faster sensors that can provide more information about the environment in a smaller amount of time—thus allowing drones to fly safely even at speeds above 40 km/h.

Reference:
https://techxplore.com/news/2021-10-high-speed-drones-unknown-ai.html

Shaik Maseera Firdose
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NFTs are not a Scam

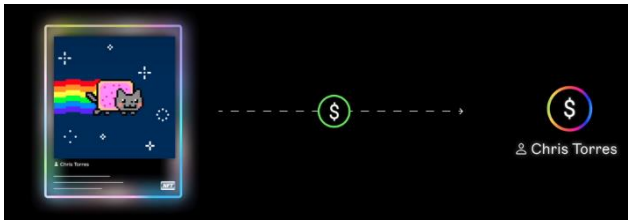
NFTs are not a scam. In fact, NFTs are the building blocks of the internet of the future. Now you must be wondering, what exactly are NFTs then. But in order to understand what NFTs hold for the future, we need to go back to the past. The year is 1992. The World Wide Web is only three years old. For the first time in human history, we can share information freely irrespective of the physical world.

One of the early internet pioneers, John Perry Barlow, posed a riddle in 1992, he said, “If our property can be infinitely reproduced and instantaneously distributed across the planet without cost, how are we going to protect it? How are we going to get paid for the work we do with our minds? And if we can't get paid, what will assure the continued creation and distribution of such work?”

On today's internet, we don't get paid for the work we do with our minds and, the content we upload to these services is trapped there. These services not only make money from our content, but they also control it. Until NFTs.

What is an NFT? It's a certificate of ownership of a file registered on the blockchain for everyone to see. With NFTs, my owning something doesn't preclude others from enjoying it. In fact, it's the opposite. The more an NFT is seen, appreciated, and understood, the more possibility it has to increase in value.

NFTs can build an internet where information can be free, but where we get paid for the work we do with our minds.



Reference:

https://www.ted.com/talks/kayvon_tehranian_how_nfts_are_building_the_internet_of_the_future?language=en

Sreenidhi
CSE-B 3rd Year

COVID-19 Has Brought Innovations

Wow what a change 2020 has bought us! Who would have thought that a cough some where in Wuhan would pull the entire world into this disruptive manner?

Though that year has bought the biggest change in our lives.

Lidl helps shoppers find quietest time. “This innovative approach uses real-time data and customer transaction numbers to determine which hours of the day are quietest to visit and which are busiest, allowing for customers to plan their shopping trips.

Oh my god, this is amazing. A German cafe is making people wear swimming pool noodles as hats to enforce social distancing.

Creative Agency BBH has come up with a way for guests to visit Sentosa Island virtually, using the popular Nintendo game Animal Crossing. The ‘Sentosa Crossing’ branded virtual experience allows people to experience the holiday destination while staying safe. It includes landmarks from the island.

What happens when fans want a real-life experience of concerts without the crowds?

Audience turn up to gig in their cars and park in rows. Then they tune in to their FM radio where the music through a limited frequency. Instead of cheering and clapping, audiences have been encouraged to beep their horns in support.

Reference:

https://blooloop.com/brands-ip/opinion/covid-19-innovations/

S. Lakshmi Chandana
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IMAGINATION SPEAKS - You may not speak but Your mind CAN!!

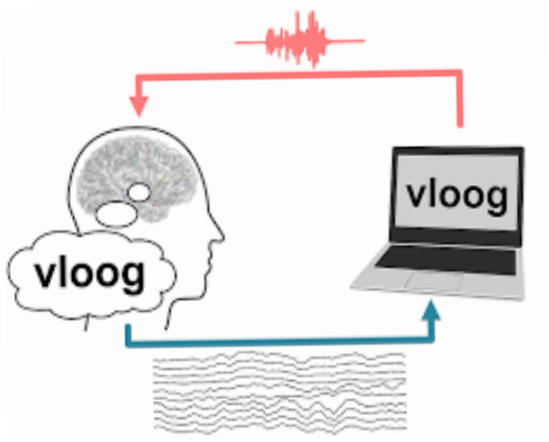
The nightmare of paralyzed people is unimaginable. The invention of a speech Neuroprosthetic aided those people to translate their imagination it translates them into speech almost immediately and outputs audible feedback to its users.. The ultimate goal is to render speech-related neural processes in the brain directly into audible speech. "Neural signals from volunteers who imagine speaking are directly translated into audible output by our speech neuroprosthetic - in real time with no perceptible latency!".

The innovative speech neuroprosthetic is based on a closed-loop system that combines technologies from modern speech synthesis with brain-computer interfaces. This system was developed by Miguel Angrick at the CSL.

A case study with a volunteer epilepsy patient who was implanted with depth electrodes for medical examinations and was in hospital for clinical monitoring. In the first step, the patient read texts aloud, from which the closed-loop system learned the correspondence between speech and neural activity by means of machine learning. "In the second step, this learning process was repeated with whispered and imagined speech". "In the process, the closed-loop system produced synthesized speech. Although the system had learned the correspondences exclusively on audible speech, audible output is also produced with whispered and imagined speech." This suggests that the underlying speech processes in the brain for audibly produced speech share to some extent a common neural substrate to those for whispered and imagined speech.

Speech Neuroprosthetics focuses on providing a natural communication channel for people who are unable to speak due to physical or neurological impairments.

"Real-time synthesis of acoustic speech directly from measured neural activity could enable natural conversations and significantly improve the quality of life of people whose communication capabilities are severely limited."



Reference:

https://www.ucsf.edu/news/2021/07/420946/neuroprosthesis-restores-words-man-paralysis

K.Shivani
EEE 3rd Year

Monitoring glucose levels without using needles

People with diabetes check their blood glucose levels by poking their fingers with needles, which is painfull. Scientists from PennState found a device to measure the blood glucose levels without pricking our fingers. They had developed a device which works with the help of Biosensors and Bioelectronics. This device measures the blood glucose level through our sweat.

Scientists developed the device with a combination of Laser-induced graphene(LIG), Nickel and Gold. LIG consists of atom thick carbon layers which is a perfect type of framework for the sensor. Nickel is used for its

good sensitivity towards glucose and gold is used such that it doesn't cause any allergic reaction to our skin.

Scientists created a microfluid chamber connected to the LIG alloy. Chamber is connected to the collection inlet that passes sweat into a solution which will not touch the skin. A compound is produced with the combination of glucose molecules with the solution. The formed compound can react with the alloy. The reaction occurred forms a electrical signal, which indicates us the concentration of glucose in sweat.

This device is low-cost, non-invasive. Scientists are working on the improvement of the product.

Reference:

https://www.techexplorist.com/monitoring-glucose-levels-using-needles/41835/?amp

M.Vasavi Chowdary
EEE 3rd Year

Cleanse Bot

World's First Bacteria killing Robot Cleanse Bot is a revolutionary pocket-sized sanitizing robot made with AI technology. It is the only smart travel robot designed to clean different surfaces.

The worry and hesitation to stay in hostels during the restoring period after the covid pandemic is highly increased, because of sanitation. Students staying in dorms could meagerly spare time and work physically to clean their beds. This problem could be solved merely by an automated smart cleaning and disinfecting robot with 3700mAh battery power bank which can fast charge other devices like phones. It cleanses hotel, hospital beds, toilet seats, blankets, phones, tablets etc.

The cleanse Bot is only 220 grams with dimensions 130mmx30mm. It uses UV-C lights to kill 99.9% of germs and bacteria. It contains 18 sensors and 4 UV-C sanitizing lights emitting all directions and AI to ensure efficient cleaning and make sure that the device doesn't falloff. Handheld mode turns off the upward-facing UV-C light, so there is no effect to hands. Its working is simple, turn on and place it on the bed and leave for 30-60 minutes, it sanitizes and disinfects. One single charge can disinfectant 6 times. It's proprietary wheel technology helps robot to go over any type of material or surface.

"Don't be trapped in someone else's dream."

Reference:
www.kickstarter.com/CleanseBot

Ch.Raja Rajeswari
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Edge Computing

The 21st century has been a century of technological change. Several highly commercial and prevalent technologies during the early 2000s have entirely vanished, and new ones have taken their place.
Have you read about edge computing ? It is one of the latest technologies of 2021, is already in use all around us – from the wearable on your wrist to the computers parsing intersection traffic flow. Other examples include smart utility grid analysis, safety monitoring of oil rigs, streaming video optimization, and drone-enabled crop management. And those applications appear poised to expand. Today, less than 10 percent of enterprise-generated data is created and processed at the edge .
These are the edge computing use case examples :

1.Autonomous vehicles

2.Remote monitoring of assets in the oil and industry

3.Smart Grid

4.Predictive Maintenance

5.In– hospital patient monitoring

6.Virtualized Radio Networks and 5G

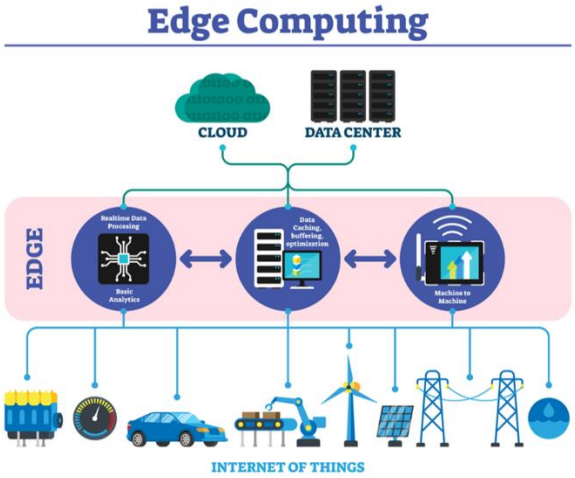
7.Cloud Gaming

8.Content delivery

9.Traffic Management

10.Smart homes

In conclusion, with edge computing, things have become even more efficient. As a result, the quality of business operations has become higher. Edge computing is a viable solution for data-driven operations that require lightning-fast results and a high level of flexibility, depending on the current state of things.



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

D. Harshitha
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Introducing the Next Generation of Self Care: COVE

We are living in an age of stress, anxiety due to studies, exams, work, financial problems and many. Stress often impacts on sleep quality and duration and indirectly has severe impact on our physical and mental health.
So how can we reduce this stress and feel comfort?
How about a device that feels like a hug for your mind?
With the help of experts on neuroscience, Feel more Labs created Cove, a light-weight wearable device that loops over the ears and wraps behind the base of the user's head to deliver vibrations directly to the user's skin to trigger the effects of affective touch in the brain that induce deep feelings of comfort and calm.

It uses the concept of affective touch, a lesser-known way to reduce stress, which is associated with the slow stroking of the skin in a manner like petting or grooming, causes the brain to release neurochemicals that not only trigger a feeling of comfort and wellbeing but that can also aid in emotional regulation.
By wearing Cove for 20 minutes, twice a day, we can experience peace of mind and can even track changes in our sleep and stress levels, access heart rate using Cove app.

Reference:
https://www.esquire.com/lifestyle/g35189998/coolest-tech-gadgets-2021/

Vishnu Priya.S
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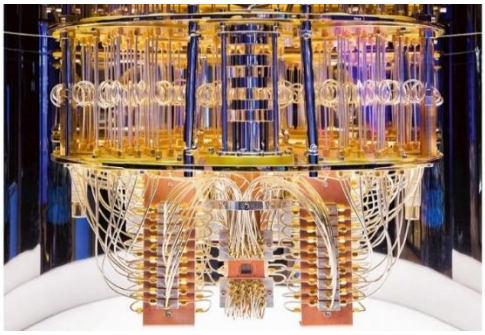
Quantum Computing

Quantum Computing is an area of computing focused in developing computer technology based on principles of quantum theory (which explains the behavior of energy and material on the atomic and subatomic levels).
Computers used today can only encode information in bits that take the value of 1 0r 0 restricting their ability. Quantum computers on the other uses quantum bits or qubits.

Now what is a Qubit?
Qubits represent atoms, ions, photons or electrons and their respective control devices that are working together to act as computer memory and a processor.
Because a quantum computer can contain these multiple states simultaneously, it has the potential to be millions of times more powerful than today's most powerful supercomputers.

Understanding Quantum Computing
Superposition and entanglement are two features of quantum physics on which these supercomputers are based. This empowers quantum computers to handle operations at speeds exponentially higher than conventional computers and at much lesser energy consumptions.

Quantum Computer vs. Classical Computer
Classical computers are best for everyday tasks that need to be completed by a computer. Meanwhile, quantum computers are great for running simulations and data analyses, such as for chemical or drug trails. These computers must be kept ultra-cold, however. They are also much more expensive and difficult to build.



In classical computers eight bits are enough to represent any number between 0 and 255. But eight qubits is enough for a quantum computer to represent every number between 0 and 255 at the same time. A few hundred entangled qubits would be enough to represent more numbers than there are atoms in the universe.

This is where quantum computers get their edge over classical ones. In situations where there are a large number of possible combinations, quantum computers can consider them simultaneously. Examples include trying to find the prime factors of a very large number or the best route between two places.

Advantages

1. The main advantage of quantum computing is that it is even classical algorithm calculations. They are also performed easily which is similar to the classical computer.
2. If we adding the qubits to the register we increase its storage capacity exponentially.
3. In this computing qubit is the conventional superposition state. So there are advantages of exponential speedup to the resulted by handle the number of calculations and method.
4. Quantum computing required less power.
5. The other advantage of quantum computing is it can execute any task very faster and very accurately compared to a classical computer. Generally, the atom changes very faster in the case of traditional computing whereas in quantum computing it changes even faster.

Disadvantages

1. The research for this problem is still continuing the effort applied to identify a solution for this problem that has no positive progress.
2. Qubits are not digital bits of the day thus they cannot use as conventional error correction.
3. The main disadvantage of Quantum computing is the technology required to implement a quantum computer is not available at present days.
4. The minimum energy requirement for quantum logical operations is five times that of classical computers.
5. Quantum CPU will have efficiency and heating problems of its own.

Applications

- Cyber security
- Drug Development
- Financial Modeling
- Better Batteries
- Cleaner Fertilization
- Traffic Optimization
- Weather Forecasting and Climate Change
- Artificial Intelligence
- Solar Capture
- Electronic Materials Discovery

Reference:

1. https://www.investopedia.com/terms/q/quantum-computing.asp#:~:text=Quantum%20computing%20is%20the%20study,of%20both%200%20and%201.
2. https://www.newscientist.com/question/what-is-a-quantum-computer/

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