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By Computer Science Department

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QUANTUM COMPUTING

harnesses phenomena from quantum physics, the study of the behavior of subatomic particles

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EDITORIAL

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VISION

To achieve academic excellence in creating globally competent professionals and ethically strong global workforce in the field of Computer Science & Engineering, facilitating research activities, catering to the ever changing industrial demands and societal needs.

MISSION

1.Creating excellence in Computer Science & Engineering through academic professionalism for the changing needs of the society.

2.Establishing centre of excellence for research and for technical development in the area of Computer Science & Engineering.

3.Developing communication skill, team work and leadership qualities for continuing education among the students, through project based and team based learning.

4.Inculcating ethics and human values for sustainable societal growth and environmental protection.

5.Empowering students for employability, aspiring higher studies and to become entrepreneur.

PROGRAM EDUCATIONAL OBJECTIVES

1. Apply computer science theory blended with mathematics and engineering to model computing systems.

2.Nurture strong understanding in logical, computing and analytical reasoning among students coupled with problem solving attitude that prepares them to productively engage in research and higher learning.

3.Communicate effectively with team members, engage in applying technologies and lead teams in industry.

4.Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

HEARING AIDS ARE GETTING SMARTER

Hearables to make life more personal than ever before

ANJANA PRAKASH

Twentyfirst centuary has alwayS demanded personalization as its first priority.People are always eager to get things more personalized, things that match their intrests most. Reaserchers and Developers are trying all the ways to add more choices to their products to increase customer satisfaction and thus their market.

Hearing aids- an instrument that helps us in hearing has come up with new purposes and more personalization. Soon, wearable devices that were used to overcome hearing impairments will tell your emotional state. These devices assess or monitor our biological signals to identify stress. The electrical signals that flows through the cortex is absorbed and analysed.

With all the functions of a hearing aid and additional functions these hearables will help us focus on sounds that we want to hear when we are struggling to hear or understand. They elimates the sounds that cause stress and negative impacts on the body. It makes the person more comfortable with the enviornment by connecting with other devices around like thermostats.

Brain activity, blood hormone, stress hormone levels, movements, eye movements, vagus nerve stimulation, temperature, skin resistance, heart rate can be accessed through ears. And they tell you about your stress, mental effort,where our eyes direct, engagement, excitement, whom you are paying attention to, physical health, what calms you. It can even figure out exactly what you are trying to hear by tracking your attention and eye movement even if you can't see it directly. The customization depends on a machine learning algorithm which obtains its data set from different sensors used to assess different parameters like heart rate. There are still challenges to increase the efficiency of hearables and the main challenge is contact that is to ensure proper and adequate continuous contact between the ear buds and skin of outer ear canal which is essential to do any biological sensing. Even the slightest disturbance due to a natural behavior like sneezing, chewing or yawning can break the contact or change the impedence of the earbud-skin connection.This may result in incorrect assessment of the persons mental and physical state

To get the maximum value the hearable must spend as much time as possible with person and this helps in constant monitoring of parameters like blood pressure, brain activity in ones daily life. This part serves a major role improving personalization and supplying the AI device connected with fresh information.

Though the personalized version of a hearable has many benefits there are some security and privacy issues concerned to its wide spread adoption. But the chances and benefits of these personalized earbuds are far more than its negatives. The technology is fast growing and it is hard to predict all effects in detail and any technology should not be killed before it's born. Nevertheless, the potential for harm must be considered.

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MILITARY ROBOT IN ACTION

ROBOTICS IN DEFENSE

ATHIRA K S

Nations all over the world in defense are getting strengthened by introducing the technological innovations. Each nation are now concentrating on widening their defensive technology hence the combat strength. As a part of this revolution, War robots was introduced in the field of defense in many developing countries. Military robots are autonomous robots or remote-controlled mobile robots designed for military applications, from transport to search & rescue and attack. Autonomous robotics would save and preserve soldiers' lives by removing serving soldiers who might otherwise be killed, from the battlefield.Increasing attention is also paid to how to make the robots more autonomous, with a view of eventually allowing them to operate on their own for extended periods of time, possibly behind enemy lines. For such functions, systems like the Energetically. Autonomous Tactical Robot are being tried, which is intended to gain its own energy by foraging for plant matter. The majority of military robots are tele-operated and not equipped with weapons; they are used for reconnaissance, surveillance, sniper detection, neutralizing explosive devices, etc. Current robots that are equipped with weapons are tele-operated so they are not capable of taking lives autonomously.Advantages regarding the lack of emotion and passion in robotic combat is also taken into consideration as a beneficial factor in significantly reducing instances of unethical behavior in wartime. Autonomous machines are created not to be "truly 'ethical' robots", yet ones that comply with the laws of war (LOW) and rules of engagement (ROE).

Hence the fatigue, stress, emotion, adrenaline, etc. that affect a human soldier's rash decisions are removed; there will be no effect on the battlefield caused by the decisions made by the individual. Military drones, or unmanned combat aerial vehicles (UCAV), are one of the oldest and most widely used military robot technologies. Their use goes back over four decades. One of the first military applications of unmanned aerial vehicles was by Israel in 1969. Israel effectively converted toy remote planes for surveillance work by equipping them with simple cameras to gather information just across their border with Egypt. For militaries, robots don't technically need to be cheaper, better, or faster for it to be worth spending money on, as long as they can keep a soldier from needlessly getting in harm's way – or keep a nation ahead of it's greatest ally should an all-out war occur.

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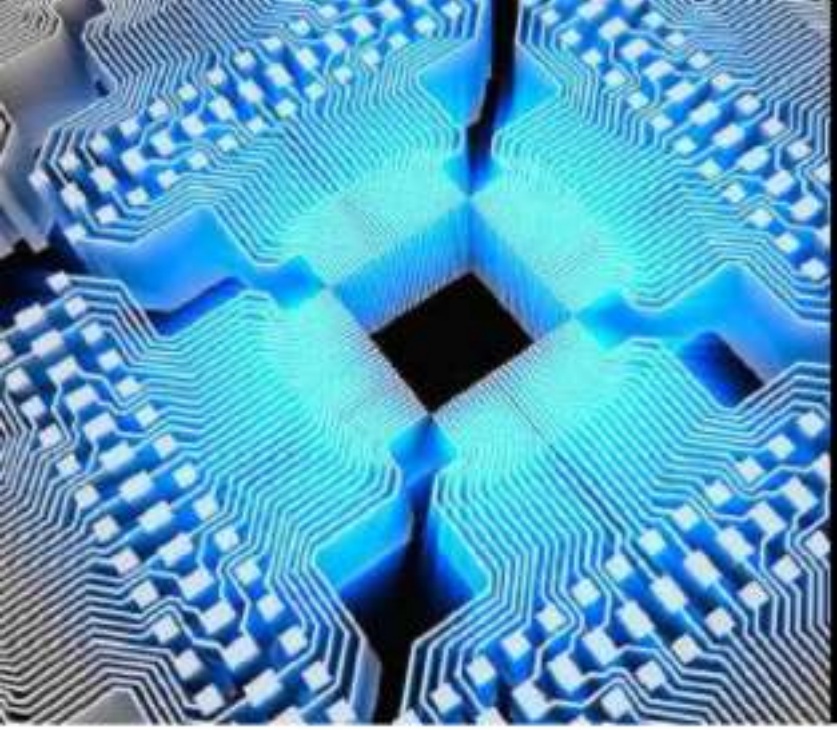

QUANTUM COMPUTING

GANESH BABU

Quantum computer built by Google could perform a calculation in three minutes and 20 seconds that would take today's most advanced classical computers approximately 10,000 years.

A quantum computer is one that harnesses phenomena from quantum physics, the study of the behavior of subatomic particles, We all inhabit and intuitively understand a world governed by Newtonian physics, which explains the behavior of tangible things such as billiard balls, planets and falling apples. But it turns out that Newton's laws don't apply to subatomic particles.

Quantum theory evolved to explain what goes on in that strange space. In certain situations, for example, quantum theory says that one subatomic particle's behavior is bound up with that of another, even if the second one is on the other side of the galaxy. This is known as "entanglement". Another principle is that a particle can be in two different states at the same time as with Schrödinger's imaginary cat, who was both alive and dead at the same time. This is known as "superposition".

Ordinary computers work with bits that can be either on or off coded as zero or one. But quantum computers work with qubits, which can have a value of 0, 1 or both .Thus two qubits can represent four states simultaneously (00, 01, 10, 11) which apparently means that 100 qubits can represent 1.3 quadrillion quadrillion states. This means that a quantum computer would be much faster and efficient at some kinds of computation than would be a classic computer.
These superpositions can be entangled with those of other objects, meaning their final outcomes will be mathematically related even if we don't know yet what
they are. The complex mathematics behind these unsettled states of entangled 'spinning coins' can be plugged into special algorithms to make short work of problems that would take a classical computer a long time to work out... if they could ever calculate them at all.
Such algorithms would be useful in solving complex mathematical problems, producing hard-to-break security codes, or predicting multiple particle interactions in
chemical reactions.

Quantum computers, if they can be built at scale, will harness properties that extend beyond the limits of classical physics to offer exponential gains in computing
power.

Google first predicted it would reach quantum supremacy by the end of 2017. But the system it built, linking together 72 qubits proved too difficult to control.
The system was given the task of proving that a random-number generator was truly random. Though that job has little practical application, the Google researchers said
that other initial uses for this computational capability included machine learning, materials science and chemistry.
Some companies, such as IBM and Google, claim we might be close, as they continue to cram more qubits together and build more accurate devices.
Not everybody is convinced that quantum computers are worth the effort. Some mathematicians believe there are obstacles that are practically impossible to overcome, putting quantum computing forever out of reach.
It's a skipping stone towards something big and only time will tell who is right.

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HOW ABOUT HAVING A VILLA THERE IN THE MOON???

ATHIRA THERES

July 21, 1969 the day when Neil Amstrong landed on the moon, even now the world cherishes the moment with great pride. It's been so long someone has stepped on it. And now it's time to go back, not for a few days but for a permanent settlement.

The only previous encounter is that two of the astronauts have lived on the surface and that too in a lunar module in the Appolo program and twelve of them have walked on the surface of the moon. There's is no air to breathe, no ocean no weather and literally no atmosphere but since there is a presence of a thin layer of gases we may call them as the moon's atmosphere. By taking all these conditions as a challenge, nasa along with the u .s space centre is planning to send people back to moon for a permenant settlement. The u .s space agency has officially declared its intention to return humans to the moon by 2024. How to get there? 'som', skidmore owings and merill ,the architectural firm is designing a moon base along with the europpean space agency and massachusetts institue of technology (mit).som is well known for designing and engineering Burj Khalifa the world's tallest building.

The important thing criterion to check out while planning to have a permenant settlement as everyone says is the "location" the known best place to set up a moon base is the "lunar south pole" since it has a enormous reserve of water ice and relatively stable temperature of 32 degrees of farhenheit Schakleton is an impact crater in the lunar southpole .this the target place to build the moon base. Designinig process goes on in an incremental basis. First step is to send landers to the schakleton which will deploy inflatable module which is upto four storeys tall.it will serve as the residential area, labs, workstations etc.

Eventhough it can't sheild humans from harmful rays or temperature swings it can be used as a temporary solution.

Scientists are busy trying to build robots which can 3d print the protective sheilds. It is estimated to take almost three months to build the protective shell and if more and more shells are build it will be connected through walkways. Is in't it exciting to have vacation trips to moon.

SPACE CULTIVATION:
A SOFTWARE UPDATE

ANJALI P R

Is it possible to cultivate plant in space? Yes as per the growing technological evolution, every impossible constraint is possible. One Astronaut on an international space tation needs "1.8 kilograms" of food and package approximately. So the resupply of the food and package for long time space mission seems very expensive and impractical. And this led to the idea of space cultivation.

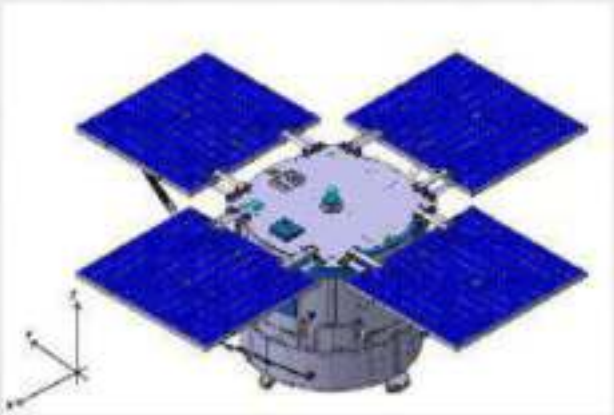
Space Gardens were often taken into space in the late 20th and 21st century.
In the context of human spaceflight, they can be consumed as food and or provide a refreshing atmosphere. NASA plans to grow plants in space to help feed astronauts, and to provide psychological benefits for long-term space flight.

It is even hard to grow a tomato plant to in sunny garden patch. So in Space it'll be even much a way to think high. That's what plant biologists and aerospace engineers in Cologne and Bremen, Germany are set to find out. The study aims to not only growing plants over there in space but also to observe the phenomena of combined biological life support systems under specific gravitational conditions like those on the other planets.

Eu:CROPIS, (Euglena and Combined Regenerative Organic-Food Production in Space) which is the name of the satellite as well as the orbital tomato-growing program. Eu:CROPIS is an Earth-orbiting mini satellite of DLR (German Aerospace Center) with the objective to study food production in Space in support of future long-duration manned space missions (life sciences). The main payloads are two greenhouses, each maintained as a pressurized closed loop system, simulating the environmental conditions of the Moon or of Mars. Numerous cameras and sensors on board will observe the growth of vegetables (tomatoes) in space.

The aim of Eu:CROPIS is to develop a stable, and symbiotic biological life support system while being exposed to gravity levels similar to those on the lunar surface as well as the surface of Mars. The scientific goal is a seed to seed experiment under gravity levels as on the lunar surface (0.16 g) as well as on the surface of Mars (0.38 g). During each six months lasting experimentation, ion concentrations in the water based flow will be measured by ion chromatographyand molecular biological analysis will be performed with Euglena cells.

The world is developing day by day and this is a century of Cyber World and technology. Space cultivation is just the beginning of new inventions.



Eu:CROPIS Satellite in deployed configuration

Eu:CROPIS Primary Payload Module

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