

Department of Computer Applications(MCA)

TechEdge
Technical
Newsletter

Vol. VI Issue 10, Oct 2023

- Alumni section
- Grene robotics unveils India's first AI-powered anti-drone system – Indrajaal
- Scientists create soft and scalable robotic hand based on multiple materials
- Computer scientists develop open-source tool for dramatically speeding up the programming language Python
- DNA chips: the billion gigabyte storage solution of tomorrow
- Amazon's AWS partners with ISRO to enhance AI capabilities with cloud technologies
- ISRO Aditya L1 mission launched
- NASA's MOXIE successfully generates oxygen on Mars
- ISRO's next mission to Moon is with Japanese, named LUPEX
- Jio launches AirFiber in 8 cities: here's everything you need to know

Disclaimer

The newsletter you received is intended for information purposes only and does not constitute a binding offer. The institute does neither give any guarantee nor assume any liability (of whatever content or nature) for the transmission of its news as well as for the timeliness, completeness and accuracy of the information contained in the newsletter and the contents on websites (including all information, services, software, etc.) directly or indirectly referred to by links or references named in the newsletter.

Compiled by:-

Aditya Sharma, Manmeet Chauhan
Rahul Singh Negi (MCA 3rd sem)

Designed by:-

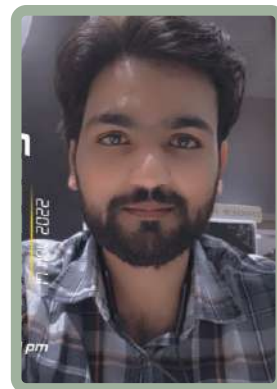
Sujeet Pratap Singh
(MCA Dept.)

Coordinated by:-

Ms. Shalika Arora
(Asst. Prof., MCA)

Alumni Section

Atif Ali
Analyst
Capgemini



Neuromorphic Computing: Mimicking the Human Brain

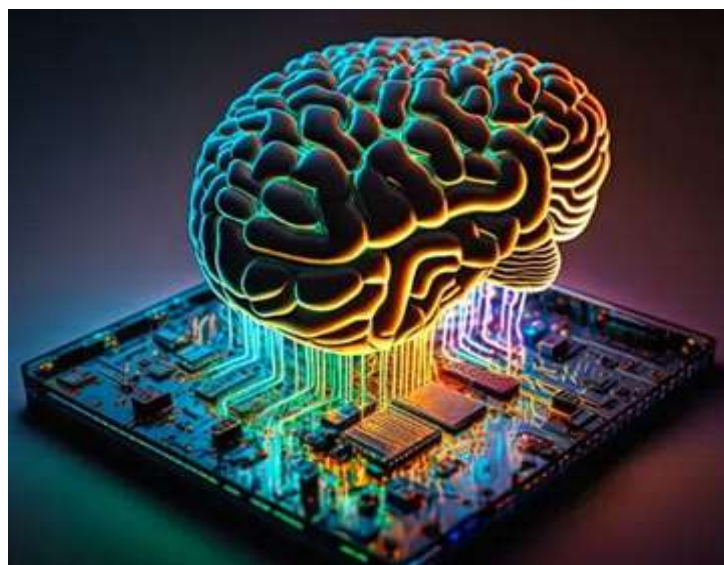
Introduction

In the ever-evolving landscape of computing, a paradigm known as neuromorphic computing is emerging as a game-changer. This innovative approach seeks to replicate the intricate architecture and functioning of the human brain within electronic systems. By drawing inspiration from the brain's neural networks, neuromorphic computing holds the potential to revolutionize artificial intelligence, cognitive computing, and a host of other applications.

Neuromorphic computing is a branch of computing that strives to imitate the brain's neurobiological architecture. The term "neuromorphic" is derived from "neuron" (nerve cell) and "morph" (form or structure), reflecting the endeavor to recreate the structural and functional characteristics of the brain's neurons and synapses in electronic circuits.

Mimicking Neural Networks

At the heart of neuromorphic computing are artificial neurons and synapses. These components emulate the behavior of biological neurons and the connections between them. Instead of relying on binary logic (0s and 1s), neuromorphic systems operate with analog signals, allowing for a more nuanced representation of information, similar to the way neurons process signals in the brain.



The Importance of Parallel Processing

One of the key strengths of neuromorphic computing lies in its ability to perform parallel processing. This is a departure from conventional von Neumann architecture, where processing and memory are distinct. In neuromorphic systems, computation and memory are intertwined, mirroring the brain's highly parallelized information processing.

Applications of Neuromorphic Computing

The potential applications of neuromorphic computing are vast and varied. These systems excel at tasks that require pattern recognition, learning, and adaptation. They hold promise in fields such as:

Artificial Intelligence- Neuromorphic computing can enhance machine learning algorithms by enabling them to process information more akin to the way humans do, leading to more flexible and adaptable AI systems.

Robotics- By emulating the brain's ability to process sensory information and make real-time decisions, neuromorphic systems can significantly improve the capabilities of robots, making them more adept at interacting with complex environments.

Healthcare- Neuromorphic computing has the potential to revolutionize medical diagnostics and treatments. It can aid in tasks like image and signal processing for medical imaging and diagnostics.

Autonomous Vehicles- The advanced processing capabilities of neuromorphic systems can enhance the perception and decision-making abilities of autonomous vehicles, improving their safety and reliability.

Challenges and Future Directions

While neuromorphic computing holds immense promise, it is not without its challenges. Designing and scaling neuromorphic systems to match the complexity of the human brain is a formidable task. Additionally, ensuring energy efficiency and addressing issues related to robustness and reliability remain active areas of research.

The future of neuromorphic computing is promising. As researchers continue to refine the technology and explore new avenues for implementation, we can anticipate a new era of computing that more closely aligns with the intricacies of human cognition.

Conclusion: A Leap Forward in Computing

Neuromorphic computing represents a paradigm shift in the world of artificial intelligence and computing. By drawing inspiration from the human brain, researchers are unlocking new possibilities for processing information and solving complex problems. As neuromorphic systems continue to evolve, they hold the potential to usher in a new era of intelligent, adaptable, and energy-efficient computing.





Grene robotics unveils India's first AI-powered anti-drone system – Indrajaal

Highlights

- *Grene Robotics has spared no expense or effort, utilizing its own financial resources and scientific expertise to create live demonstrations of Indrajaal for government officials and tri-services officers*
- *The trial for Indrajaal is being conducted at Grene Robotics expansive 79-acre test facility located in Hyderabad*
- *Grene Robotics, a Hyderabad based company introduces Indrajal, India's inaugural AI driven anti done system, making a noteworthy stride in the realm of Indian defence technology Grene*

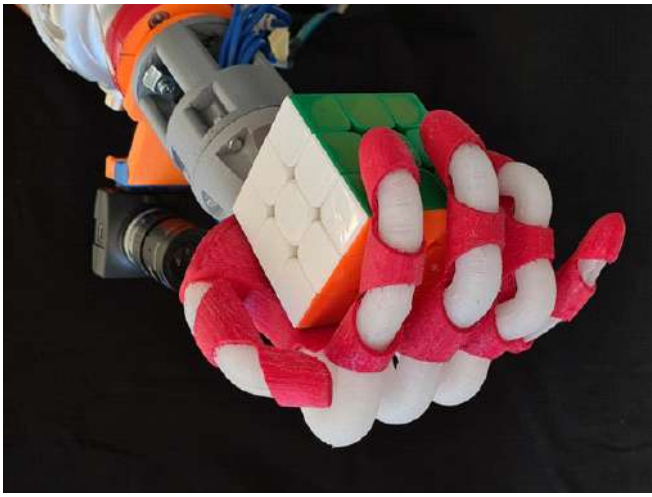
In a remarkable feat of innovation and technological prowess, Hyderabad-based private sector firm Grene Robotics has introduced Indrajaal, world's only autonomous wide area, counter-unmanned aircraft system (C-UAS). This state-of-the-art system is touted as capable of safeguarding against micro, mini, small, large, and extra-large drones, signaling a significant advancement in Indian defense technology.

The grand unveiling of Indrajaal took place in the presence of Lieutenant General Gurmit Singh, the governor of Uttarakhand, who hailed the system as a groundbreaking advance in defense technology. General Singh emphasized that this innovation would not only enhance the nation's self-reliant military capabilities but also address the pressing need to defend against the escalating threat posed by drones.

The trial for Indrajaal is being conducted at Grene Robotics' expansive 79-acre test facility located in Hyderabad. This facility serves as the proving ground for a technology that has the potential to reshape the landscape of security for defense, public infrastructure, and private enterprises alike.

Indrajaal is built on a foundation of 12 unique layers of technology, a feat powered by artificial intelligence, marking a world-first achievement. This cutting-edge system possesses the ability to detect, identify, classify, track, and swiftly neutralize threats in real time. Its coverage extends to 360 degrees, offering protection over areas spanning up to 4000 square kilometers against all categories and levels of unmanned autonomous threats.

Indrajaal is currently demonstrating its prowess in safeguarding against a wide array of aerial threats, including low radar cross-section (RCS) threats, medium altitude long endurance (MALE) and high-altitude long endurance (HALE) UAVs, loitering munitions, smart bombs, rocket showers, nano and micro drones, swarm drones, and other contemporary threats.



Highlights

- *Revolutionary Soft Robotic Hand: A Game-Changer for Affordable, Safe Robots*
- *Portuguese Researchers Create Scalable Soft Robotic Hand for Future AI Advancements*
- *Mimicking Nature: Soft Robotic Hand Design Redefines Human-Robot Interaction*
- *Accessible Soft Robotic Hands: A Step Closer to Everyday Robotic Companions*

Scientists create soft and scalable robotic hand based on multiple materials

Robots based on soft materials are often better at replicating the appearance, movements and abilities of both humans and animals. While there are now countless soft robots, many of these are difficult to produce on a large-scale, due to the high cost of their components or their complex fabrication process.

Researchers at University of Coimbra in Portugal recently developed a new soft robotic hand that could be more affordable and easier to fabricate. Their design, introduced in *Cyborg and Bionic Systems*, integrates soft actuators with an exoskeleton, both of which can be produced using scalable techniques.

"Most robots are made of rigid materials," Pedro Neto, one of the researchers who carried out the study, told Tech Xplore. "However, when we observe animals, we notice that their bodies can be composed of hard parts (skeletons) and soft parts (such as muscles). Some animals, like earthworms, are entirely soft-bodied. Taking inspiration from nature, we anticipate that the next generation of robots will incorporate components made of soft materials or, in some cases, they can be entirely soft-bodied."

Compared to rigid robots, soft robotic systems could be safer and could better co-exist with humans or animals in both outdoor and indoor environments. For instance, if they collide with humans, animals, or objects in their surroundings, these robots are less likely to cause significant damage or injuries.

The key objective of the recent work by Neto and his colleagues was to develop a new soft robotic hand that is both safe and affordable. Such a hand would theoretically be easier to deploy on a large-scale, thus fueling new research and innovation in the field of robotics.

"We leveraged finite element analysis to optimize the design before physically fabricating the hand, reducing prototyping costs," Neto explained. "The utilization of regular 3D printing proved effective by directly printing some components in soft materials and printing molds in rigid materials."

The soft robotic hand created by Neto and his colleagues is based on several different materials. Its carefully designed structure was meant to replicate the appearance and functionality of human hands, reproducing their movements and abilities.

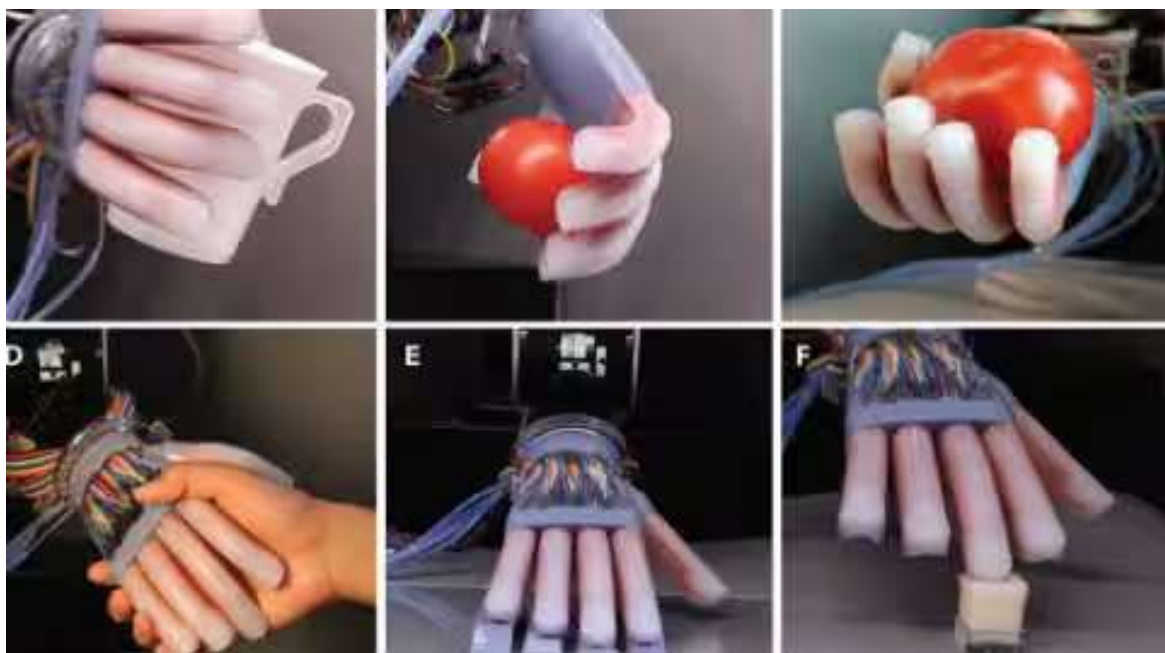
"The robotic hand's configuration consists of five soft actuators, each corresponding to a finger, and an exoskeleton to promote finger's bendability," Neto said. "An ON-OFF controller maintains the specified finger bending angles, enabling the hand to effectively grip objects of varying shapes, weights, and dimensions."

The researchers so far evaluated the performance of their robotic hand in a series of simulations and experiments. Their initial results are highly promising, as the hand could successfully grasp numerous objects with different shapes, weight, and sizes.

"The primary contribution is the integrated design-fabrication system that utilizes finite element analysis to optimize the design prior to their fabrication," Neto said. "This achievement has the potential to increase the accessibility of soft robotic hands while lowering costs and eliminating the typically time-consuming design-fabrication procedures, which frequently rely on resource-intensive iterative workflows."

In the future, the soft robotic hand developed by this team of researchers could be used by both academic teams and individual roboticists to test new artificial intelligence (AI) algorithms and other computational tools aimed at advancing robot abilities. In addition, its design could open new avenues for the low-cost fabrication of humanoid robots that can assist humans with their everyday activities.

"Our next studies will focus on improving the fabrication of soft actuators and sensors, aiming to enhance the accessibility of soft robots to a wider audience," Neto added. "The control of soft robots using artificial intelligence is another research topic that we are working on."





Computer scientists develop open-source tool for dramatically speeding up the programming language Python

A team of computer scientists at the University of Massachusetts Amherst, led by Emery Berger, recently unveiled a prize-winning Python profiler called Scalene. Programs written with Python are notoriously slow—up to 60,000 times slower than code written in other programming languages—and Scalene works to efficiently identify exactly where Python is lagging, allowing programmers to troubleshoot and streamline their code for higher performance.

There are many different programming languages—C++, Fortran and Java are some of the more well-known ones—but, in recent years, one language has become nearly ubiquitous: Python.

"Python is a 'batteries-included' language," says Berger, who is a professor of computer science in the Manning College of Information and Computer Sciences at UMass Amherst, "and it has become very popular in the age of data science and machine learning because it is so user-friendly." The language comes with libraries of easy-to-use tools and has an intuitive and readable syntax, allowing users to quickly begin writing Python code.

"But Python is crazy inefficient," says Berger. "It easily runs between 100 to 1,000 times slower than other languages, and some tasks might take 60,000 times as long in Python."

Programmers have long known this, and to help fight Python's inefficiency, they can use tools called "profilers." Profilers run programs and then pinpoint which parts are slow and why.

Unfortunately, existing profilers do surprisingly little to help Python programmers. At best, they indicate that a region of



Highlights

- *UMass Amherst Researchers Introduce Scalene: A Game-Changing Python Profiler for Lightning-Fast Code*
- *Python Speed Woes Solved: Meet Scalene, the Profiler with AI-Powered Performance Boosts*
- *Python Developers Rejoice: Scalene Profiler Unveils AI-Driven Code Optimization*
- *Scalene: The Python Profiler Revolutionizing Code Efficiency with AI Insights*
- *Boosting Python Speed: Scalene Profiler Wins Best Paper Award at USENIX Conference*



code is slow, and leave it to the programmer to figure out what, if anything, can be done.

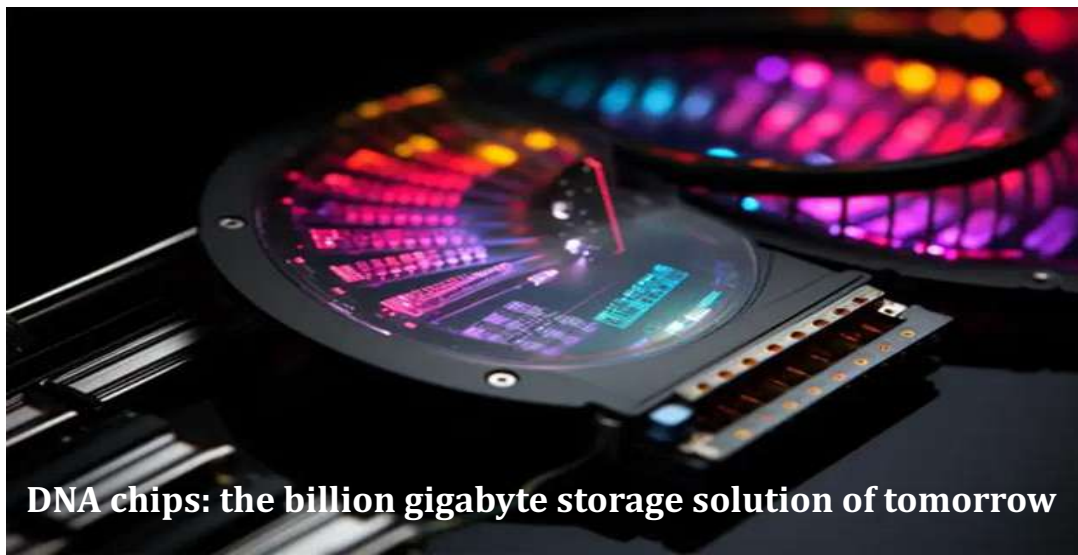
Berger's team, which included UMass computer science graduate students Sam Stern and Juan Altmayer Pizzorno, built Scalene to be the first profiler that not only precisely identifies inefficiencies in Python code, but also uses AI to suggest how the code can be improved.

"Scalene first teases out where your program is wasting time," Berger says. It focuses on three key areas—the CPU, GPU and memory usage—that are responsible for the majority of Python's sluggish speed. Once Scalene has identified where Python is having trouble keeping up, it then uses AI—leveraging the same technology underpinning ChatGPT—to suggest ways to optimize individual lines, or even groupings of code. "This is an actionable dashboard," says Berger. "It's not just a speedometer telling you how fast or slow your car is going, it tells you if you could be going faster, why your speed is affected and what you can do to get up to maximum speed."

"Computers are no longer getting faster," says Berger. "Future improvements in speed will come less from better hardware and more from faster, more efficient programming."

Scalene is already in wide use and has been downloaded more than 750,000 times since its public unveiling on GitHub. A paper describing this work appeared at this year's USENIX Conference on Operating System Design and Implementation, where it won a best paper award.





DNA chips: the billion gigabyte storage solution of tomorrow

Highlights

- *Unlocking the Potential of DNA: Scientists Develop DNA Chips for Data Storage Revolution"*
- *Nature's Blueprint: Researchers Harness DNA to Create the Future of Data Storage*
- *Data Storage Breakthrough: DNA Chips Offer Sustainable and Long-lasting Solution*
- *DNA Data Storage: A Promising Frontier in the Fusion of Biology and Technology*
- *Towards a Circular Economy: DNA Chips Pave the Way for Sustainable Computer Technology*

In the form of DNA, nature shows how data can be stored in a space-saving and long-term manner. Würzburg's chair of bioinformatics is developing DNA chips for computer technology.

The hereditary molecule DNA is renowned for its ability to store vast amounts of information over long periods of time in an incredibly small space. For a good ten years, scientists have therefore been pursuing the goal of developing DNA chips for computer technology, especially for the long-term archiving of data. Such chips would be superior to conventional silicon-based chips in terms of storage density, longevity, and sustainability.

Four recurring basic building blocks are found in a DNA strand. A specific sequence of these blocks can be used to encode information, just as nature does. To build a DNA chip, the correspondingly coded DNA must be synthesized and stabilized. If this works well, the information is preserved for a very long time – researchers assume several thousand years. The information can be retrieved by automatically reading out and decoding the sequence of the four basic building blocks.

Challenges in DNA Data Storage

“The fact that digital DNA data storage with high capacity and a long lifespan is feasible has been demonstrated several times in recent years,” says Professor Thomas Dandekar, head of the Chair of Bioinformatics at Julius-Maximilians-Universität (JMU) Würzburg. “But the storage costs are high, close to 400,000 US dollars per megabyte, and the information stored in the DNA can only be retrieved slowly. It takes hours to days, depending on the amount of data.” These challenges must be overcome to make DNA data storage more applicable and marketable. Suitable tools for this are light-controlled enzymes and protein network design software. Thomas Dandekar and his chair team members Aman Akash and Elena Bencurova discuss this in a recent review in the journal *Trends in Biotechnology*.

Dandekar's team is convinced that DNA has a future as a data store. In the journal, the JMU researchers show how a combination of molecular biology, nanotechnology, novel polymers, electronics, and automation,

coupled with systematic development, could make DNA data storage useful for everyday use possible in a few years.

Innovative DNA Chip Development

At the JMU Biocentre, Dandekar's team is developing DNA chips made of semiconducting, bacterially produced nanocellulose. "With our proof of concept, we can show how current electronics and computer technology can be partially replaced by molecular biological components," says the professor. In this way, sustainability, full recyclability, and high robustness even against electromagnetic pulses or power failures could be achieved, but also a high storage density of up to one billion gigabytes per gram of DNA.

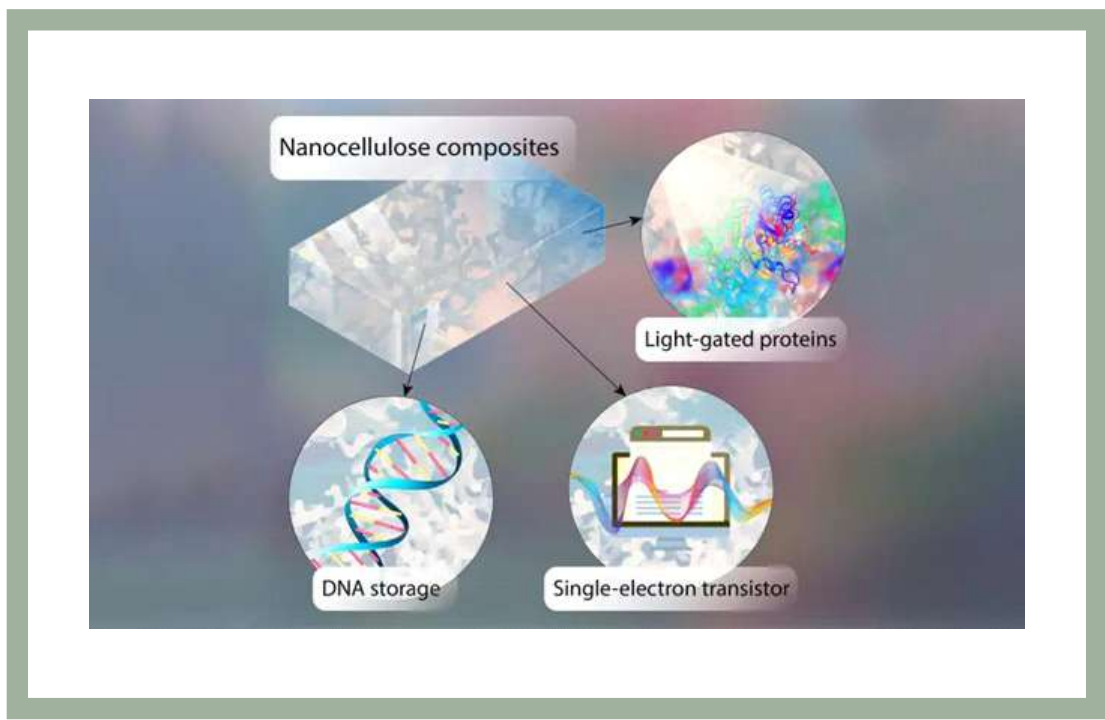
Thomas Dandekar rates the development of DNA chips as highly relevant: "We will only last as a civilization in the longer term if we make the leap into this new type of sustainable computer technology combining molecular biology with electronics and new polymer technology."

What is important for humanity, he said, is to move to a circular economy in harmony with planetary boundaries and the environment. "We need to achieve this in 20 to 30 years. Chip technology is an important example of this, but the sustainable technologies to produce chips without e-waste and environmental pollution are not yet mature. Our nanocellulose chip concept makes a valuable contribution to this. In the new paper, we critically examined our concept and advanced it further with current innovations from research."

Further Improving DNA Storage Media

Dandekar's team is currently working on combining the DNA chips made of semiconducting nanocellulose even better with the designer enzymes they have developed. The enzymes also need to be further improved. "In this way, we want to achieve better and better control of the DNA storage medium and be able to store even more on it, but also save costs and thus step by step enable practical use as a storage medium in everyday life."

Reference: "How to make DNA data storage more applicable" by Aman Akash, Elena Bencurova and Thomas Dandekar, 15 August 2023, *Trends in Biotechnology*.





Amazon's AWS partners with ISRO to enhance AI capabilities with cloud technologies

Highlights

- Amazon's AWS has formed a strategic partnership with ISRO and IN-SPACe to advance space-tech through cloud computing. This collection empowers startups, research institutes and students
- This collaboration aims to support space-tech innovations through cloud computing, opening exciting possibilities in the space sector
- The main aims to harness the limitless potential of space technology and cloud computing for the benefit of India and the global space community

Amazon Web Services (AWS), a major player in the cloud computing industry, has entered into a strategic Memorandum of Understanding (MoU) with the Indian Space Research Organization (ISRO) and the Indian National Space Promotion and Authorization Centre (IN-SPACe).

Shalini Kapoor, Director and Chief Technologist, Public Sector, AWS India, and South Asia, emphasized that cloud computing-led innovations can significantly enhance the space industry by enabling quicker decision-making and pushing the boundaries of what's possible. AWS is committed to assisting startups in identifying use cases, accelerating solution development, and nurturing a talent pool in India specialized in cloud and space technologies.

The partnership will provide space start-ups, research institutions, and students access to state-of-the-art cloud technologies, facilitating the rapid development of new space solutions. Cloud computing will streamline the management of vast volumes of raw space data and support AI, machine learning (ML), and analytics workloads, all in a highly cost-effective manner.

ISRO, IN-SPACe, and AWS will collaborate to foster and expand the startup community within the space-tech sector. AWS will extend support to eligible space startups through the AWS Activate program, offering tools, resources, and expert technical assistance at no cost. This support aims to accelerate the development and commercialization of innovative space solutions. Additionally, startups will gain access to AWS's global expertise in building aerospace and satellite solutions through the AWS Space Accelerator program.

Vinod Kumar, Director of the Promotion Directorate at IN-SPACe, highlighted the importance of leveraging space technology and cloud computing to elevate India's space sector to new heights. After the successful Chandrayaan-3 moon landing and the Aditya L-1 mission.



Highlights

- *ISRO Aditya L1 mission was launched successfully on September 2, 2023 at 11:50 AM IST from the Satish Dhawan Space Centre in Sriharikota, India*
- *The Aditya L1 mission is expected to last for five years. During this time, it will collect valuable data about the Sun that will help scientists to better understand its behaviour and its impact on Earth*
- *The spacecraft is about the size of a refrigerator and weighs 1.5 tons and the mission is named after Aditya, the Hindu god of the Sun*

Aditya-L1, India's first space mission to study the Sun, began collecting data by deploying one of the seven instruments on board, a day before its departure from the Earth orbit, according to Indian Space Research Organization (ISRO).

The sensors of the Supra Thermal and Energetic Particle Spectrometer (STEPS) sub-system, part of the ASPEX (Aditya Solar Wind Particle Experiment) payload on the spacecraft, have begun measuring fast-moving charged particles generated in processes within the Sun.

“This data helps scientists analyses the behavior of particles surrounding Earth,” the ISRO said in a statement.

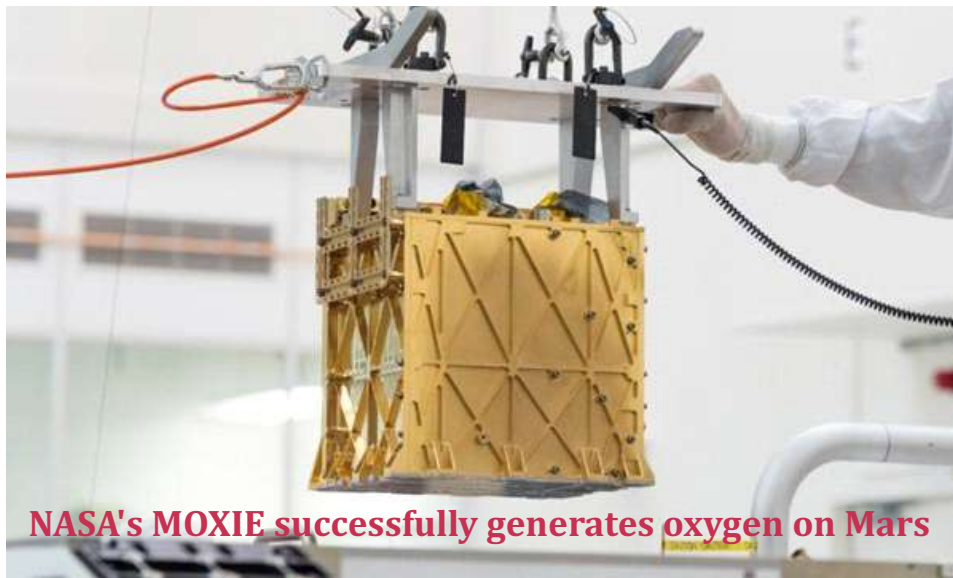
Aditya-L1 was launched on September 2 using a polar satellite launch vehicle (PSLV-C57) from Sriharikota just a few days after the successful soft landing of Chandrayaan-3's Vikram Lander on the south polar region of the Moon.

The spacecraft is currently going around the Earth in a 256 km x 121,973 km orbit. Early morning, it is scheduled to leave the Earth orbit and start moving towards the L1 (Lagrange 1) point of the Earth-Sun system, the designated location from where it will make observations of the Sun.

The STEPS sensors were activated on September 10 itself, when its orbit around the Earth went beyond 50,000 km, the ISRO said. After the necessary health checks of the instrument, the ground stations have begun collecting data. Data collection by this particular sub-system will continue throughout Aditya's journey to the designated L1 point and even after that.

As the Indian Space Research Organization successfully launched Aditya-L1, the country's maiden solar mission, former Himachal Pradesh Chief Minister and the Leader of Opposition, Jai Ram Thakur on Saturday(2nd Sep)said that the successful lift-off is another achievement of India in space research.

Thakur said that after the success of Chandrayaan-3 mission, India became the first country to reach the South pole of lunar surface and now we have passed another milestone in space after successful launching of the Aditya L-1.



Highlights

- *NASA said that MOXIE had produced a total of 122 grams of oxygen since Perseverance landed on Mars. This amount is about what a small dog would breathe in 10 hours. While the amount of oxygen is small*
- *The instrument was able to produce 12 grams of oxygen in one hour. NASA says this is twice as much as its engineers first estimated the system could produce*

The American space agency NASA says a device placed on Mars to produce oxygen has performed better than expected in a series of experiments. The system is called MOXIE. It is designed to change, or convert, carbon dioxide captured from the Mars atmosphere into oxygen. The instrument works through a process called electrolysis. This process uses extreme heat to separate oxygen atoms from molecules of carbon dioxide.

Carbon dioxide makes up about 95 percent of the Martian atmosphere, NASA reports. The rest is mostly molecular nitrogen and argon. Molecular oxygen makes up just 0.16 percent of the Martian atmosphere. But future exploration of Mars and possibly other planets by humans will require a large supply of oxygen. NASA has said the chemical element will be necessary for astronauts to breathe and to produce rocket fuel for launches carried out from the Martian surface.

A NASA explanation of the instrument states: “The goal of a Big MOXIE would be to make and store all the oxygen that the astronaut and their rocket would need for their mission before they even launch.” Such a system would need to make between 2,000 to 3,000 grams of oxygen per hour, the space agency noted. Trudy Kortes is the director of technology demonstrations at NASA Headquarters in Washington D.C. She said the agency was pleased to be able to support such a technology. “By proving this technology in real-world conditions, we’ve come one step closer to a future in which astronauts ‘live off the land’ on the Red Planet,” Kortes said.

In a statement issued earlier this month, leaders of the demonstration project said MOXIE had completed its 16th and final experiment. They noted the device’s “impressive performance” had proven it was possible to capture oxygen from the Martian atmosphere. Such oxygen “could help supply breathable air or rocket propellant to future astronauts,” the statement said. One of the most exciting aspects of MOXIE is its embodiment of the concept of in-situ resource utilization. Instead of relying on Earth for essential resources, MOXIE enables astronauts to manufacture oxygen and fuel right on the Martian surface. This approach not only reduces the need to transport vast quantities of supplies from Earth but also makes long-term human presence on Mars more sustainable.



ISRO's next mission to Moon is with Japanese, named LUPEX

Highlights

- Indian Space Research Organisation (ISRO) is preparing for one more lunar mission, this one in collaboration with Japanese space agency, The Japan Aerospace Exploration Agency (JAXA)
- The LUPEX mission is aimed at exploring lunar polar region suitability for establishing a base on the Moon for sustainable activities, obtaining knowledge regarding the availability of lunar water-ice resources, and other

ISRO's next likely Moon mission is in partnership with its Japanese counterpart, a venture that's gathering steam. Lunar Polar Exploration Mission (LUPEX) is a collaborative venture between Japan Aerospace Exploration Agency (JAXA) and the Bengaluru-headquartered Indian space agency. JAXA and ISRO are developing the rover and lander, respectively.

The rover will carry not only the instruments of ISRO and JAXA but also those of US space agency NASA and European Space Agency (ESA). Vice-Chair of Japan's Cabinet Committee on National Space Policy and Director General, National Astronomical Observatory of Japan, Saku Tsuneta, visited ISRO headquarters here earlier this month and had a meeting with the space agency's Chairman Somanath S. They discussed the progress of the LUPEX mission.

According to JAXA, the LUPEX mission is aimed at exploring lunar polar region suitability for establishing a base on the Moon for sustainable activities; obtaining knowledge regarding the availability of lunar water-ice resources, and demonstrating lunar and planetary surface exploration technologies such as vehicular transport and overnight survival.

LUPEX will also explore the polar regions of the Moon, this time venturing into the permanently shaded regions. One half of the Moon never faces the Sun and is therefore permanently dark. To land in these areas, the spacecraft and the onboard instruments have to have an alternative power supply option through an onboard battery. LUPEX is also planned to investigate the abundance of water in the polar regions and explore the possibilities of locating a long-term station in these areas. For the LUPEX mission, the launch vehicle and rover are supposed to be contributed by the Japanese agency, while the lander will come from ISRO. Incidentally, JAXA is sending its own landing mission, its first, to the Moon later this week.

The main aim of another proposed instrument -- Lunar Electrostatic Dust experiment (LEDEX) -- is to detect the presence of charged dust particles and to confirm the dust levitation process in the volatile-rich polar region, and to estimate approximate dust size and flux of charged, levitated dust particles. According to an ISRO official, the LUPEX mission is slated to be launched in the year 2025.



Jio launches AirFiber in 8 cities: here's everything you need to know

Highlights

- On Ganesh Chaturthi, Jio has launched its all-new Jio AirFiber or wireless broadband services. The service is available in 8 cities for now - Delhi, Mumbai, Chennai, Ahmedabad, Bengaluru, Hyderabad, Kolkata and Pune
- Jio's optical fibre infrastructure spans over 1.5 million kilometres across India

Reliance Jio launched its AirFiber service on the festival of Ganesh Chaturthi. The service and its Ganesh Chaturthi launch was announced by Reliance Industries Limited (RIL) chairman Mukesh Ambani at the conglomerate's annual general meeting (AGM) on August 31.

Our extensive fiber-to-the-home service, JioFiber, already services over 10 million customers, with hundreds of thousands more getting connected each month. But there are still millions of homes and small businesses to be connected at a rapid pace," a company press release quoted Akash Ambani, chairman, Reliance Jio Infocom Limited, as saying at the launch event.

As per the press statement, the service is live in eight cities: Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Kolkata, Mumbai, and Pune.

Digital entertainment- All leading digital TV channels (more than 550) in high definition; 'catch-up TV' and free access to the most popular OTT apps (more than 16) on TV, laptop, mobile or tablet.

Broadband- Jio's reliable WiFi connectivity and high-speed broadband experience in every corner of your house or office.

Smart Home service- Cloud PC for education and work-from-home, security and surveillance solutions, healthcare, education, smart home IOT, gaming, and home networking.

Home devices (no extra cost)- WiFi router, 4K Smart Set Top Box, and voice-active remote.

Jio AirFiber will be available at a minimum price of Rs 599 per month, while the Jio AirFiber Max will be priced starting at Rs 1,499, the company said.

Airtel Xstream AirFiber, launched in July, offers users the service with a one-time refundable security deposit of Rs 2,500 and a monthly subscription of Rs 799 per month. It also requires a minimum commitment of six months.

Aimed at solving the challenge of last-mile connectivity for fiber optic cables, Jio AirFiber will act as a personal WiFi hotspot in homes, connected to ultra-high-speed internet using Jio's 5G service.

Jio will also provide AirFiber users with a 4K set-top box and outdoor network devices, in addition to the WiFi router, all for free.

AirFiber plans will be available under two categories, namely AirFiber and AirFiber Max.



Glimpses