Department of Data Science

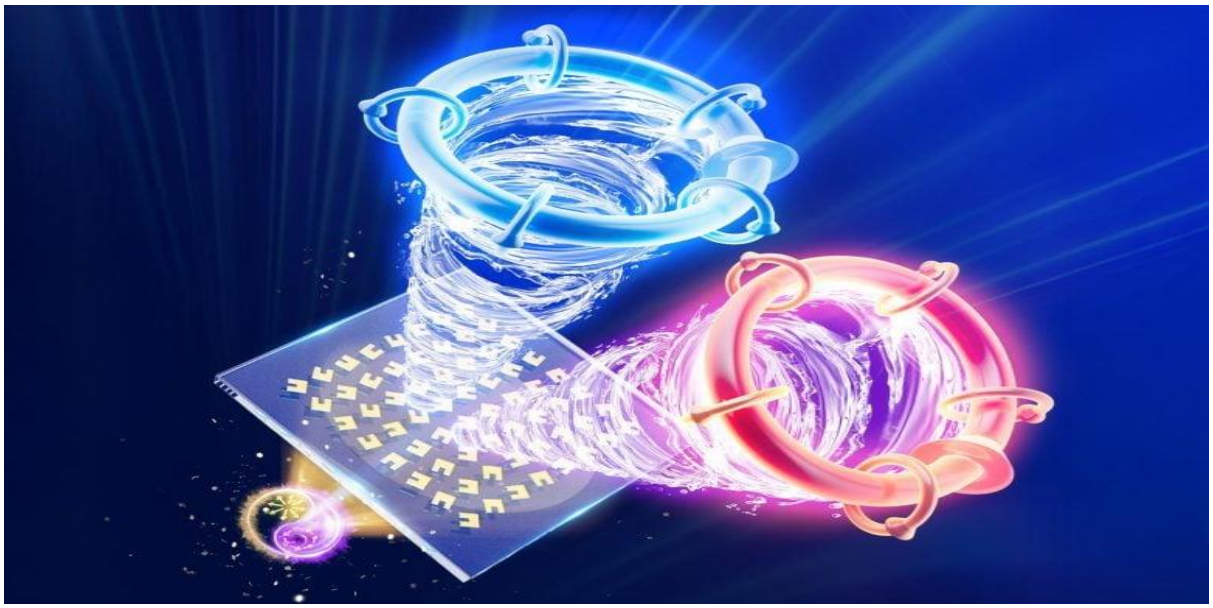
Weekly Data Science Bytes

Ghost Robotics' Arm Brings Manipulation to Military Quadrupeds

- Ghost Robotics is today announcing a major upgrade for their Vision 60 quadruped: an arm. Ghost, a company that originated at the GRASP Lab at the University of Pennsylvania, specializes in exceptionally rugged quadrupeds, and while many of its customers use its robots for public safety and disaster relief, it also provides robots to the U.S. military, which has very specific needs when it comes to keeping humans out of danger.
- In that context, it's not unreasonable to assume that Ghost's robots may sometimes be used to carry weapons, and despite the proliferation of robots in many roles in the Ukraine war, the idea of a legged robot carrying a weapon is not a comfortable one for many people. IEEE Spectrum spoke with Ghost co-founder and current CEO Gavin Kenneally to learn more about the new arm, and to get his perspective on selling robots to the military.

Source: https://spectrum.ieee.org/ghost-robotics-quadruped-robot-arm

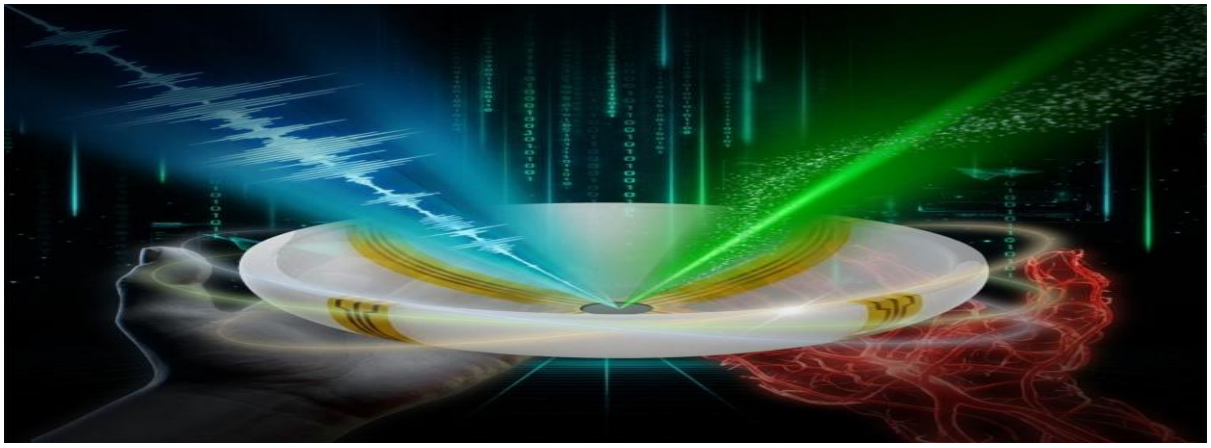
Donut-Shaped Light Could Make Wireless Signals Far More Reliable



- A new metasurface lets scientists flip between ultra-stable light vortices, paving the way for tougher, smarter wireless communication.
- Scientists have developed a new optical device capable of producing two different types of vortex-shaped light patterns: electric and magnetic. These unusual light structures, called skyrmions, are known for their exceptional stability and resistance to interference. Because they hold their shape so reliably, they are strong candidates for carrying information in future wireless communication systems.
- "Our device not only generates more than one vortex pattern in free-space-propagating terahertz pulses but can also be used to switch, on demand, between two modes using the same integrated platform," said corresponding author Xueqian Zhang from Tianjin University. "Such controllability is essential for real applications, where reliable selection and reproduction of a desired stated are crucial for practical information encoding."

Source: https://scitechdaily.com/donut-shaped-light-could-make-wireless-signals-far-more-reliable/

Scientists Develop a New Way To See Inside the Human Body Using 3D Color Imaging



- A newly developed imaging method blends ultrasound and photoacoustics to capture both tissue structure and blood-vessel function in 3D.
- By blending two powerful imaging methods, researchers from Caltech and USC have developed a new way to see inside the human body with unprecedented speed and detail. The technique produces three-dimensional, full-color images that show not only the shape of soft tissues but also how blood vessels are functioning in real time. In early demonstrations, the researchers successfully imaged several different parts of the human body, highlighting the versatility of the approach.
- This combined imaging method could significantly improve how doctors detect and study disease. Potential applications include more precise breast tumor imaging, new ways to track nerve damage caused by diabetes, and advanced tools for observing brain structure alongside blood flow. The work suggests a path toward medical scans that are both more informative and easier to repeat over time.

Source: https://scitechdaily.com/scientists-develop-a-new-way-to-see-inside-the-human-body-using-3d-color-imaging/

SpaceX in merger talks with other Musk companies ahead of IPO

- SpaceX is exploring deals with other companies helmed by serial entrepreneur Elon Musk, leaving investors working through permutations between space, autonomous driving and artificial intelligence to analyze which combination makes the most sense.
- The rocket maker is in discussions to merge with xAI ahead of a blockbuster public offering planned for this year, Reuters reported on Thursday. The combination would bring Musk's rockets, Starlink satellites, X social media platform and Grok chatbot under one roof, according to a person briefed on the matter and two regulatory filings.

Source: https://www.reuters.com/world/musks-spacex-merger-talks-with-xai-ahead-planned-ipo-source-says-2026-01-29/

Napster Is Doing AI Music Now — And Still Taking Shots at the Major Labels

- Three weeks after abruptly shutting down its user-scarce streaming service, the current incarnation of Napster is launching a new AI music app — even as it continues to face a lawsuit from Sony Music over allegedly unpaid royalties. "We don't think that the future of music involves the labels anymore," Napster CEO John Acunto tells Rolling Stone. "I just think they're dead."The Napster app, available today for iOS and Android, adds a personality-heavy chatbot layer onto a prompt-driven music-generation format that should be otherwise familiar to users of services like Suno.
- The company boasts more than 15,000 AI personas, all powered by Google's Gemini, and they hope consumers will think of their approach as "jamming" with "AI artists." "What we're trying to do is create more of an experience," says Napster CTO Edo Segal. "The human experience of interacting with other parties, and a kind of multi-turn creation process, in the same way that humans jam and create stuff together." In contrast to the original Napster's defiance of copyright law, the company promises that they'll be licensing "ethically trained," copyright-friendly music-generating models.For Napster, music is now just one piece of a much larger operation.

Source: https://rollingstoneindia.com/napster-is-doing-ai-music-now-and-still-taking-shots-at-the-major-labels/amp/

INDAIA: How To Lead The Coming Tech Revolution

Startups, techies, industry acceptance, government backing: the elements are all there. India, which just hosted a global AI meet, will simply have to build on them

Amitabh Kant

The India-hosted Global Partnership on AI concluded yesterday. Here is a heart-warming story on this new tech. Deep in the densely forested heartlands of India, at the border of Maharashtra and Telangana, an innovative Indian startup is weaving a tale of transformation. UdyogYantra, a New Delhi based venture is quietly revolutionising nutrition in Etapalli, a remote block in Gadchiroli district.

Food for thought | A pilot project started in one school in the block has an AI-enabled machine built by the startup. It takes photographs of young children with their plate of mid-day meals. Without any human intervention, the machine assesses the quality of the food in line with the specific nutritional requirements of the child. This has helped the district administration identify not only malnourished children but also critical nutrients lacking from meals, as well as quantity and quality issues.

Grassroots reach | This is just one stellar example of how the benefits of cutting-edge AI are reaching grassroots. Through the AI-powered Bhashini application, GOI is helping citizens access digital services in over 121 Indian languages. The PM KISAN scheme now has an AI chat-bot, which will be available in 22 languages and will assist and empower farmers.

Opportunity, not threat | The world is gripped by anxiety around AI disrupting the job market as it stands. India, given its success in taking technology to the last mile, can turn this into an opportunity. AI can reshape India's economic landscape. We have the richest demographic dividend and the highest penetration of AI talent in the world. India's workforce must be equipped with the right skills to ride and rise with the AI wave.

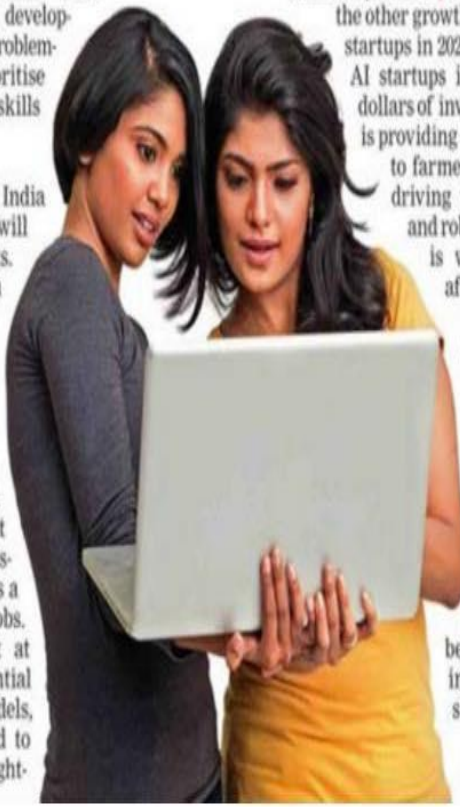
AI-economy | AI is predicted to contribute nearly a trillion dollars to India's economy by 2035. In the near term, it is poised to inject approximately $450-500 billion into the nation's GDP by 2025, representing a significant 10% of India's goal of achieving a $5 trillion GDP.

New job market | In a recent survey covering over a thousand Indian employers, an astounding 85% of organisations predict that AI will generate new job opportunities in the next 1-5 years, and enhance the quality of jobs. Additionally, 77% of employers believe AI will boost job security and career development. This sentiment is shared by the workforce, with job seekers expecting AI to increase work efficiency, aid in skill development, enable complex problem-solving, and prioritise employment based on skills over experience.

Roles of the future | As India Inc deploys AI, India will need more AI experts. Roles such as data scientists, machine learning engineers, AI researchers, and algorithm developers will become the jewels of the job market. The emergence of 'prompt engineers', a term that was virtually non-existent a few years ago, is a great example of new jobs. These experts, adept at harnessing the potential of Large Language Models, have rapidly ascended to become highly sought-after professionals in today's job market.

Boost upskilling and reskilling | A study by ServiceNow and Pearson forecasts that by 2027, a remarkable 16.2 million workers in India will be reskilling and upskilling to keep pace with technology. The study highlights that this technological wave is anticipated to generate over 4.7 million new technology jobs. It is crucial to recognise that the transformative influence of AI extends far beyond the technology sector, equalising opportunities across various fields like healthcare, education, manufacturing, retail and banking.

Indian AI pioneers | AI-focused entrepreneurship is the other growth area. From just 18 AI-centric startups in 2021, there are 60-plus generative AI startups in India in 2023. Millions of dollars of investment have flown in. Dehaat is providing agricultural finance solutions to farmers. Artpark is a not-for-profit driving technology milestones in AI and robotics for social good. Atom360 is working to make healthcare affordable and accessible to all.



A revolution India can lead | In the 18th century, India missed a major opportunity to lead the era of innovation following the first Industrial Revolution. However, this time we are better prepared to be at the helm of the approaching revolution. India has the capability to become the world's premier incubator for exceptionally skilled AI workers.

The writer is G20 Sherpa, India. Views are personal