

# TechEdge Technical Newsletter

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### Cyber-attack

A cyber-attack is an attempt by cyber criminals, hackers or other digital adversaries to access a computer network or system, usually for the purpose of altering, stealing, destroying or exposing information. Cyber attacks can target a wide range of victims from individual users to enterprises or even governments. When targeting businesses or other organizations, the hacker's goal is usually to access sensitive and valuable company resources, such as intellectual property (IP), customer data or payment details.

#### Top Cybersecurity Attacks And Data Breaches in 2023-2022

##### Zero day attack in Twitter-

The breach initiated on December 4, 2023, resulted in the exposure of over 200 million Twitter profiles, compiled into a 59 GB RAR archive. Scrapers gained access via a vulnerable API, utilizing prior data collections, potentially leading to targeted phishing scams that Twitter users should remain vigilant about.

##### Incident Breakdown-

On December 4, 2023, a hacker forum hosted the sale of over 200 million Twitter profiles for nearly \$2 worth of hacker forum credits. This dataset, initially available for \$30,000 in July, was later circulated for free by November 27, 2022. Another file, encompassing data from 17 million individuals, was privately distributed in November.

Since July 22, 2022, cybercriminals have been vending sizable troves of scraped Twitter user profiles across multiple online hacker forums. These profiles contained private contact details, usernames, follower counts, creation dates, and public data. Exploiting a Twitter API flaw in 2021, these collections were amassed, enabling users to cross-reference email addresses and phone numbers with Twitter IDs.

##### Impacts-

The breached data, encapsulated in a 59 GB RAR file comprising six text documents, may or may not include specific customer details, contingent on prior exposure in other breaches. This disclosure poses significant privacy risks, especially for anonymous users, potentially unmasking their identities.

Anonymous Twitter users could be identified, jeopardizing dissidents, journalists, activists, and similar individuals worldwide. While the leak encompasses only email addresses, threat actors might exploit it for phishing attempts, particularly targeting verified accounts. Verified accounts with large followings are prime targets for cryptocurrency scams.

##### Accountability-

No hacker group has claimed responsibility for the breach. The data was published by a threat actor named StayMad on a hacking forum.

##### Attack Process-

In 2021, the Twitter API vulnerability allowed the merging of public and private data, constructing user profiles by cross-referencing IDs with email addresses and phone numbers. Scrapers leveraged another Twitter API to extract public data, feeding the vulnerable API with lists to ascertain Twitter ID matches for phone numbers and email addresses.

Despite Twitter patching the vulnerability in January 2022, threat actors are now freely distributing collections obtained over a year ago.



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##### Prevention Measures-

Secure API development, adherence to best practices, continuous monitoring against new threats, and regular penetration testing are vital to thwart similar attacks. The 'Have I Been Pwned' service now notifies users if their email addresses are part of the leaked data.

Vigilance against targeted phishing scams is crucial. Users sharing credentials across multiple services are particularly vulnerable, as hackers may exploit leaked information to access other accounts. Unique passwords managed by digital password managers, enabling multi-factor authentication, and cautious handling of unsolicited links or emails are recommended preventive measures.



#### Aadhaar Data Breach of 815 Million Citizens, India

##### Attack Summary-

US-based cybersecurity firm Resecurity reported a significant leak on the dark web, exposing personal information of around 815 million Indian citizens. The leaked data, offered for sale, includes names, phone numbers, addresses, Aadhaar, and passport information.

##### Incident Overview-

On October 9th, a threat actor known as 'pwn0001' posted on Breach Forums, offering access to 815 million "Indian Citizen Aadhaar & Passport" records. The company Resecurity engaged with the threat actor, who was willing to sell the entire Aadhaar and Indian passport database for \$80,000. Investigations suggest that the compromised data might be sourced from the Indian Council of Medical Research (ICMR) database.

##### Impact Analysis-

The breach involves extensive personal data including names, phone numbers, passport and Aadhaar numbers, affecting a significant portion of the Indian population, over 800 million individuals.

**Accountability-**

The Central Bureau of Investigation (CBI) is currently probing the breach, initially discovered by the hacker 'pwn0001'. There are claims that the compromised data might be linked to the Indian Council of Medical Research (ICMR) database.

**Attack Method-**

The breach, attributed to 'pwn0001', led to the exposure of personal data, including details of COVID-19 vaccinated citizens, such as names, phone numbers, passport, and Aadhaar numbers. The breach follows a previous incident in June, where data from the CoWin website, including VVIPs' information, was allegedly leaked via a Telegram messenger channel.

**Preventive Measures-**

The breach raises concerns given India's reliance on digital public infrastructure (DPI), primarily Aadhaar, mobile numbers, and bank accounts for transferring benefits and innovation. To secure Aadhaar biometric data, individuals can use the Aadhaar Biometric Lock feature to prevent unauthorized access to their biometric information. This feature is particularly crucial considering the extensive use of Aadhaar-enabled bank accounts for transactions and withdrawals. Locking biometrics via the UIDAI website or mAadhaar app prevents their use for authentication until unlocked, providing an added layer of security against potential fraudulent activities.

**Deezer Users Data Breach**

**Attack Summary-**

On November 6th, 2022, a hacker posted a 60GB CSV file on a forum, containing personal data from 228 million Deezer members. Deezer reported that the breach occurred in 2019 via a third-party partner, with whom they ceased collaboration in 2020. Deezer assures robust security measures but advises users to reset their passwords and enable two-factor authentication (2FA).

**Incident Overview-**

Following a hacker's offer of information from over 200 million users for sale, Deezer, a globally recognized music streaming platform with millions of subscribers, acknowledged a significant data breach. The breach, dated back to 2019, involved hackers acquiring a snapshot of user data from a third-party service, no longer associated with Deezer since 2020.

Deezer asserts it cooperated with the third-party provider to fortify security. Measures taken include obtaining ISO 27001 and SOC 2 certifications, contractual data security obligations, GDPR-compliant data protection agreements, and certificates of data destruction post-contract termination.

**Impact Analysis-**

The hacker uploaded a 60GB CSV file on November 6th, 2022, containing personal details from 228 million Deezer members—non-anonymized information encompassing 257,829,454 records. The exposed data includes email addresses, first and last names, birthdates, gender, city and country details, user IDs, and registration dates. The leak affects individuals in the United States, Great Britain, France, Germany, Brazil, Mexico, Italy, Turkey, Columbia, and Guatemala.



**Accountability-**

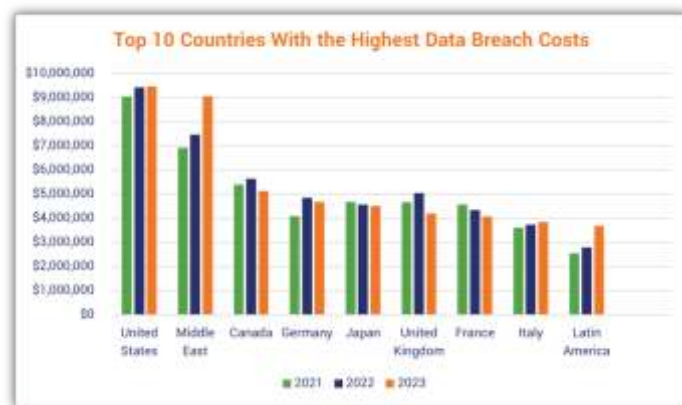
No hacker collective has claimed responsibility. The breach data was posted by a threat actor on a breach forum. The full data dump price remains undisclosed, shared privately via direct messaging. It's unclear if the data has been purchased yet. The hacker initially released a sample of 1 million records, later updating with a sample of 5 million lines.

**Attack Method-**

Following the hacker's disclosure, Deezer learned of a 2019 breach at one of their partners, resulting in the exposure of a snapshot of non-sensitive user data. Deezer maintains strong security measures, emphasizing that this breach didn't compromise passwords or payment information.

**Preventive Measures-**

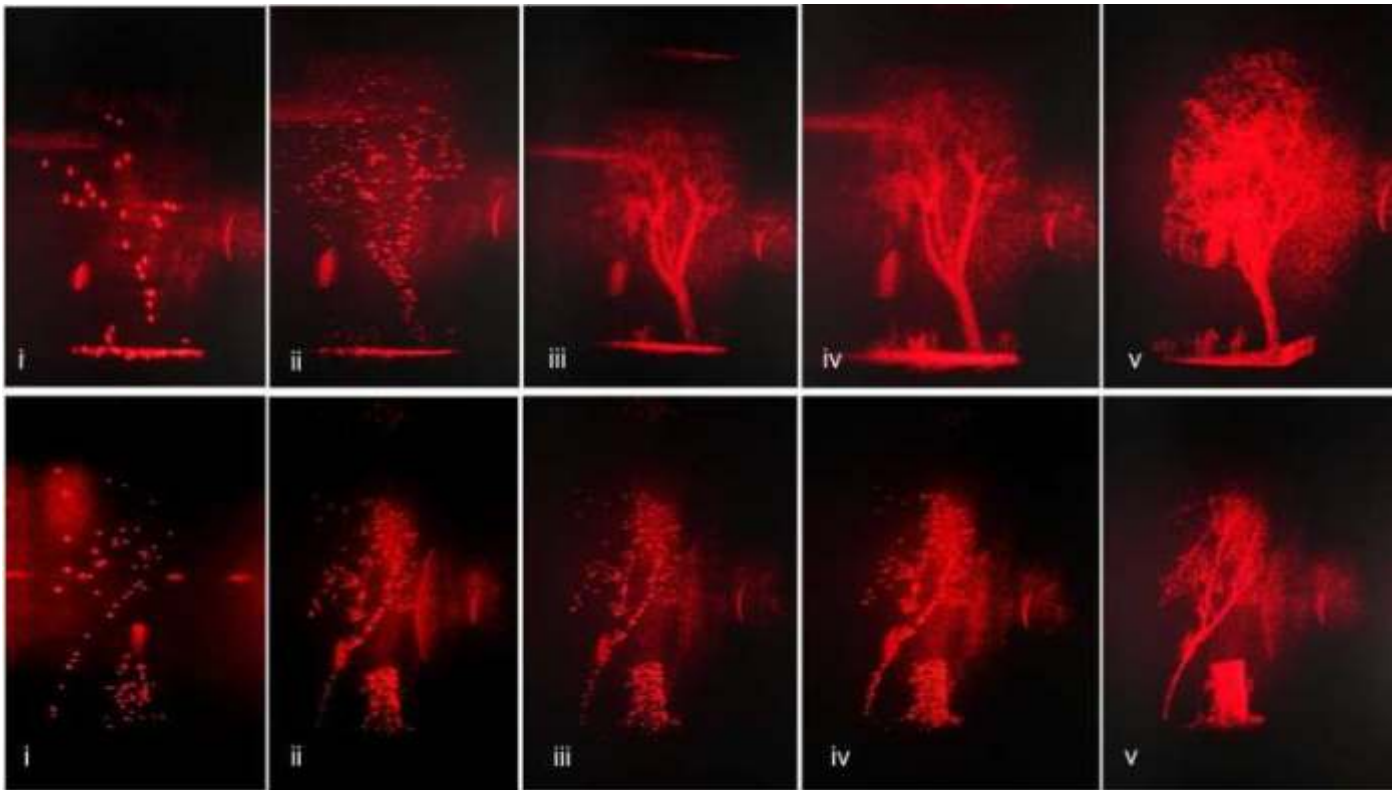
'Have I Been Pwned' integrates Deezer's data leak into its breach notification service, alerting affected subscribers. Deezer users are urged to remain vigilant against phishing attempts aiming to steal passwords or sensitive information. Resetting Deezer passwords and using unique ones for other platforms, alongside enabling 2FA, are recommended. A dependable password manager like KeePass is suggested for managing multiple passwords securely.



A 360-degree Heads-up Display View Could Warn Drivers Of Road Obstacles In Real Time

Headlines

- *3D Holographic Display Boosts Road Safety by Revealing Hidden Hazards in Real Time*
- *Researchers Develop Augmented Reality System for Dynamic 3D Holograms of Road Obstacles*
- *Driving Innovation: New Tech Keeps Eyes on the Road with 3D Holographic Projections*
- *Google Collaboration Paves the Way for Testing 3D Holographic Displays in Cars for Enhanced Safety*



Researchers have developed an augmented reality heads-up display that could improve road safety by displaying potential hazards as high-resolution three-dimensional holograms directly in a driver's field of vision in real time.

Current heads-up display systems are limited to two-dimensional projections onto the windshield of a vehicle, but researchers from the Universities of Cambridge, Oxford and University College London (UCL) developed a system using 3D laser scanner and LiDAR data to create a fully 3D representation of London streets.

The system they developed can effectively "see" through objects to project holographic representations of road obstacles that are hidden from the driver's field of view, aligned with the real object in both size and distance. For example, a road sign blocked from view by a large truck would appear as a 3D hologram so that the driver knows exactly where the sign is and what information it displays.

The 3D holographic projection technology keeps the driver's focus on the road instead of the windshield, and could improve road safety by projecting road obstacles and potential hazards in real time from any angle. The results are reported in the journal *Advanced Optical Materials*.

Every day, around 16,000 people are killed in traffic accidents caused by human error. Technology could be used to reduce this number and improve road safety, in part by providing information to drivers about potential hazards. Currently, this is mostly done using heads-up displays, which can provide information such as current speed or driving directions.

"The idea behind a heads-up display is that it keeps the driver's eyes up, because even a fraction of a second not looking at the road is enough time for a crash to happen," said Jana Skirnewskaja from Cambridge's Department of Engineering, the study's first author. "However, because these are two-dimensional images, projected onto a small area of the [windshield], the driver can be looking at the image, and not actually looking at the road ahead of them."

For several years, Skirnewskaja and her colleagues have been working to develop alternatives to heads-up displays (HUDs) that could improve road safety by providing more accurate information to drivers while keeping their eyes on the road.

"We want to project information anywhere in the driver's field of view, but in a way that isn't overwhelming or distracting," said Skirnewskaja. "We don't want to provide any information that isn't



*directly related to the driving task at hand."*

The team developed an augmented reality holographic point cloud video projection system to display objects aligned with real-life objects in size and distance within the driver's field of view. The system combines data from a 3D holographic setup with LiDAR (light detection and ranging) data. LiDAR uses a pulsed light source to illuminate an object and the reflected light pulses are then measured to calculate how far the object is from the light source.

The researchers tested the system by scanning Malet Street on the UCL campus in central London. Information from the LiDAR point cloud was transformed into layered 3D holograms, consisting of as many as 400,000 data points. The concept of projecting a 360° obstacle assessment for drivers stemmed from meticulous data processing, ensuring clear visibility of each object's depth.

The researchers sped up the scanning process so that the holograms were generated and projected in real time. Importantly, the scans can provide dynamic information, since busy streets change from one moment to the next.

*"The data we collected can be shared and stored in the cloud, so that any drivers passing by would have access to it-it's like a more sophisticated version of the navigation apps we use every day to provide real-time traffic information,"* said **Skirnewskaja**. *"This way, the system is dynamic and can adapt to changing conditions, as hazards or obstacles move on or off the street."*

While more data collection from diverse locations enhances accuracy, the researchers say the unique contribution of their study lies in enabling a 360° view by judiciously choosing data points from single scans of specific objects, such as trucks or buildings, enabling a comprehensive assessment of road hazards.

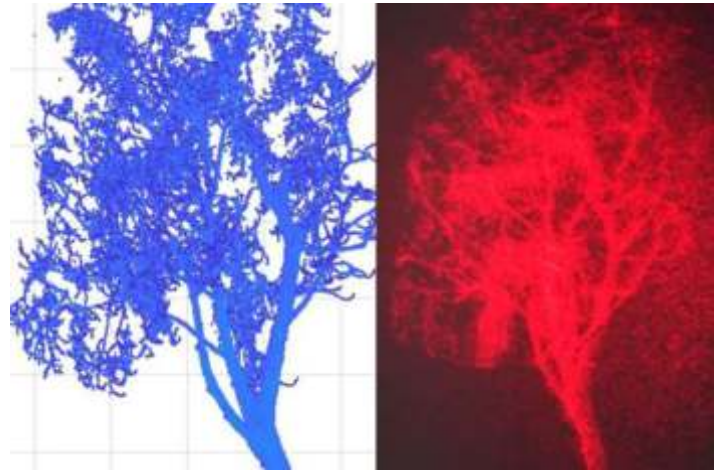
*"We can scan up to 400,000 data points for a single object, but obviously that is quite data-heavy and makes it more challenging to scan, extract and project data about that object in real time,"* said **Skirnewskaja**. *"With as little as 100 data points, we can know what the object is and how big it is. We need to get just enough information so that the driver knows what's around them."*

Earlier this year, Skirnewskaja and her colleagues conducted a virtual demonstration with virtual reality headsets loaded with the LiDAR data of the system at the Science Museum in London. User feedback from the sessions helped the researchers improve the system to make the design more inclusive and user-friendly. For example, they have fine-tuned the system to reduce eye strain, and have accounted for visual impairments.

*"We want a system that is accessible and inclusive, so that end users are comfortable with it,"* said **Skirnewskaja**. *"If the system is a distraction, then it doesn't work. We want something that is useful to drivers, and improves safety for all road users, including pedestrians and cyclists."*

The researchers are currently collaborating with Google to develop

the technology so that it can be tested in real cars. They are hoping to carry out road tests, either on public or private roads, in 2024.



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Scientists Develop 'Flying Dragon' Robot to Fight Fires from a Distance

Headlines

- Japanese Researchers Unveil Dragon Firefighter: A Water-Blasting Robot to Tackle Dangerous Fires
- Revolutionizing Firefighting: Open-Source Plans for Dragon Firefighter Robot Released Worldwide
- Innovation in Action: Dragon Firefighter Successfully Extinguishes Flames at World Robot Summit 2020
- Water-Powered Hero: Dragon Firefighter's Blueprint Published for Global Roboticist Collaboration

Imagine a flying dragon that doesn't spout fire, but instead extinguishes it with blasts of water. Thanks to a team of Japanese researchers, this new kind of beast may soon be recruited to firefighter teams around the world, to help put out fires that are too dangerous for their human teammates to approach.

The blueprint of this novel firefighter robot, called the Dragon Firefighter, has been published in *Frontiers in Robotics and AI*. And as it has been published as Open Science, roboticists around the world may freely use the plans to build their own Dragon Firefighters, for the benefit of all.

"We here present a prototype of a four-meter-long, remotely controllable flying firehose robot, engineered to safely and efficiently extinguish fires in buildings by directly approaching the fire sources," said joint corresponding author Dr. Yuichi Ambe, an assistant professor at Osaka University.

A research team from Prof Satoshi Tadokoro's laboratory at Tohoku University began working on similar flying robots in 2016. Since then, 11 researchers and students have contributed to its further development. Prior and during development, they liaised with Japanese firefighters to better understand their needs.

**Jet propulsion**

The Dragon Firefighter's firehose is propelled upward (flying at two meters above the ground) by eight controllable jets of water spouting from its center and head. The firehose can change shape and be oriented towards flames, steered by a control unit in a wheeled cart behind. The cart is connected through a supply tube to a fire truck with a water reservoir of 14,000 liters.

The nozzles spout water at a rate of 6.6 liters per second with a pressure of up to one megapascal. The hose's tip contains a conventional and thermal imaging camera, which help to find the location of the fire.

The Dragon Firefighter received its baptism of fire at the opening ceremony of the World Robot Summit 2020 (WRS2020), held in September 2021 in Fukushima. There, it successfully extinguished (49 min 00 s to 51 min 00 s) the ceremonial flame, consisting of fireballs lit by another robot, at a distance of four meters. Besides detailing its design, the present study also discusses lessons learned during this first demonstration of the Dragon's abilities, as well as specifying further improvements made since.

**Dr. Yu Yamauchi**, an assistant professor at Akita Prefectural University and another corresponding author, said, "Since the



demonstration at WRS2020, we have continued to work on improving our Dragon and have learned many new things."

"For example, we found that the original passive dampening mechanism which counters oscillations of the Dragon Firefighter's body was impractical: it took too long to prepare for flight. We also found that heat from fires can cause detrimental plastic deformation in outdoor applications of the corrugated tube that holds the water hose and electric cables."

Other improvements detailed in the study include better waterproofing, a nozzle unit capable of handling a wider range of net forces, and an improved mechanism for channeling water flow. But further developments are in the pipeline.

**Ready to fly in 10 years**

"We estimate that it will take approximately 10 more years to deploy our robot in real-world firefighting scenarios," said **Ambe**.

"The primary challenge will be to extend its reach to beyond 10 meters. Developing effective firefighting tactics tailored to this robot's unique capabilities will likewise be a critical aspect of further development."



6 Best Tools for Reverse Image Search to Spot Fake News

It is important to know about tools that can help curb the spread of misinformation. One of the ways to identify fake images online is reverse image search, a digital investigation technique that uses a picture as a search query.



Headlines

- *Digital Sleuths: How Reverse Image Search Tools Bust Online Deception Unlock the power of reverse image search in exposing digital falsehoods.*
- *Quick Guide: Google, Yandex, and More for Seamless Image Verification". A swift rundown on top tools – Google, Yandex, TinEye, and others – for confident online fact-checking.*
- *"Image Verification Made Simple: TinEye, Bing, and Tools for Easy Fact-Checking" Demystifying image verification with user-friendly tools like TinEye, Bing, and more.*
- *"Beyond Search: Pixsy and Getty Images Track Visual Content Origins" Explore Pixsy and Getty Images for detailed insights into image origin and usage.*

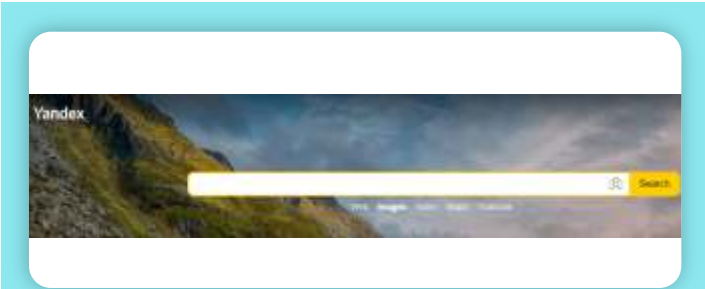
We live in an era which is dominated by visual content and a single picture conveys a thousand words. But it is also an era of rampant misinformation and fake news, and therefore, it is important to know about tools that can help curb the spread of misinformation. One of the ways to identify fake images online is reverse image search, a digital investigation technique that uses a picture as a search query.

In this article, we tell you about the six best tools for reverse image search.



1. Google reverse image search

Google reverse image search is one of the most widely used tools. All one has to do is upload the image or link you wish to search in the search query and scroll through the results. Since this is powered using Google Lens, the user can also search for the image using the application on the phone. One can also make use of this application to copy the text on the image and translate it too.



2. Yandex reverse image search

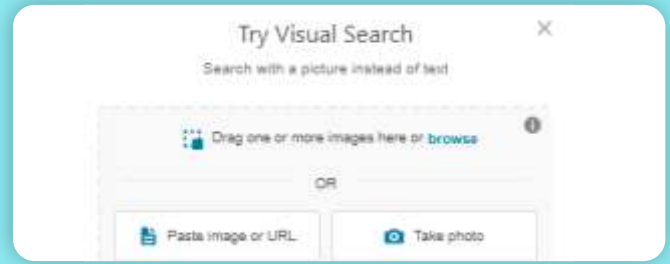
Yandex is a Russian search engine, and it operates very much like Google search engine-you need to insert either the image or URL to find out the source of the image





**3. TinEye**

TinEye is an image search and recognition tool. There is a Chrome extension of the same available online. The website too lets the user upload the image or insert a link of the picture.



**4. Microsoft Bing**

The modus operandi of checking the image using Bing reverse image is similar to Google and Yandex reverse image search.



**5: Pixsy**

Pixsy is an online service that allows photographers to track their images and see where and how they are being used. While using this website, you have to login to the account. Once you upload the image, it takes some time for the website to fetch the results. It shows results under top matches and unseen matches.



**6. Getty images**

Getty images is a stock images website. One can find high resolution royalty-free images on the website.

This website also offers you to browse photos using an image or a video. If it is a picture of a person who holds a powerful position or a big event, you can easily find it on Getty images website.





**New Technology can Rejuvenate and Extend the Life of Old Solar Panels**

Headlines

- **Revolutionary Technology:** EtaVolt's innovation from NTU Singapore rejuvenates over 90% of global solar panels, addressing a \$2 billion energy loss due to degradation, offering a scalable solution for tropical climates.
- **Efficiency in Minutes:** The Advance Regenerations Technology repairs solar panels with precise temperature and intense light in under five minutes, recovering up to 5% lost field performance, potentially extending protection for up to five years.
- **Full Sustainability Cycle:** EtaVolt not only revitalizes panels but also provides smart recycling, established in 2019, aligning with Singapore's energy transition goals by automating the recovery of valuable materials like silicon for reuse.



Developed at NTU Singapore, a new device can quickly rejuvenate and extend the life of old and new solar panels using heat and light. A spin-off from Nanyang Technological University, Singapore (NTU Singapore) called EtaVolt has developed a nifty device that can rejuvenate and extend the life of old (and new) photovoltaic (PV) panels. The technology has been extensively field-tested and can be used on around 90% of all existing PV panels available worldwide. The technology has been successfully commercialized and is ready to scale up for widespread market exposure.

**A Game-Changer for Solar**

Exavolt's technology is a game-changer in the solar industry, especially in tropical regions like Singapore, where panels degrade quickly due to harsh environmental conditions.

Due to harsh environmental conditions, solar panels lose their efficiency soon after installation, especially during the first year. This drop in performance can be up to 10% or more over the panels' lifespan. This, EtaVolt explains, translates to an estimated energy loss of US\$2 billion globally, based on the global 1-terawatt solar power capacity.

The common way of maintaining solar panels is by cleaning the top glass layer or replacing the entire module. Unfortunately, no inexpensive solutions currently available in the market can effortlessly restore a solar panel's efficiency on-site. Advance Regenerations Technology by EtaVolt works for over 90% of silicon solar cells in the market, including those containing boron, oxygen, defects, and impurities.

*"We have known for a long time that while harvesting sunlight gives us an almost inexhaustible source of energy, producing solar*

*panels requires a lot of energy and generates a high carbon footprint. While this carbon emission can be offset by the theoretical long service life of the solar panels, estimated at 25 years, the reality is that solar panels in tropical countries face harsher conditions and there has been no real solution to restore and recycle the silicon cells- the core technology of solar panels,"* says **Prof Madhavi**, who is also the Executive Director of NTU's Sustainability Office.

*"Our solar rejuvenation method has not only been rigorously tested and validated but has shown field-proven results in various commercial applications. The technology has been successfully implemented in projects with major partners in the solar industry, such as renewable energy solutions firm Vector Green, demonstrating its effectiveness and potential for widespread adoption,"* explained **Dr. Wang**, Co-founder of EtaVolt **Dr. Stanley Wang**, who is also a Project Manager at ERI@N.

But how does it work? As EtaVolt explains, when precise temperature and intense light are applied to solar cells, they excite material molecules, causing them to move quickly, changing their arrangement and repairing light and heat damage. The process of repairing solar panels prevents energy leakage by patching holes in a bucket-like fashion, ensuring optimal light energy collection.

The new device can automatically move over solar panels up to 7.5 feet (2.3 meters) long, helping to treat them and recover up to 5% of their lost field performance. The process takes less than five minutes. Up to five years of protection can be provided, depending on the type of solar panel. It can also be used indoors or for outdoor solar farms.

**EtaVolt as recycle panels**

EtaVolt was established in 2019 by Dr. Wang and Dr. Andy So, the company was incubated by Ecolabs Centre of Innovation for Energy, which is a national platform hosted by ERI@N. The platform aims to accelerate deep-tech energy innovation capabilities in Singapore to support the nation's future energy transition.

EtaVolt provides solar panel rejuvenation and smart recycling services for solar panels. Through full automation, they dismantle waste solar panels and recover useful materials and resources, such as silicon, which can be reused for other purposes.

SpaceX Makes History with a 19th Reuse of a Falcon 9 Rocket

Headlines

- **Historic Reuse:** SpaceX breaks records with its Falcon 9 rocket completing a remarkable 19th flight, launching 23 Starlink satellites. The veteran booster, in service since May 2020, achieves another successful landing.
- **SpaceX's Reusability Milestone:** Eight years since its first successful orbital-class rocket landing, SpaceX continues to lead in reusable rocket technology, with over 250 successful landings. The latest Falcon 9 mission advances Elon Musk's vision for cost-effective space exploration.
- **Starlink Success:** SpaceX's Starlink project, providing high-speed internet via a constellation of satellites, boasts 2.3 million users in 70 countries. The Falcon 9's 19th flight emphasizes the company's commitment to lowering costs and increasing mission frequency for ambitious space endeavors.



The company launched 23 of its Star link internet satellites on a Falcon 9 rocket that had flown 18 times before, breaking its own record for the most flights by a single booster.

SpaceX has achieved a new milestone in its quest to reuse rockets and reduce the cost of spaceflight. The company launched 23 Starlink internet satellites on a Falcon 9 rocket that had flown 18 times before, breaking its record for the most flights by a single booster.

**First debuted in May 2020**

The historic launch occurred from Cape Canaveral Space Force Station in Florida on December 23 at 12:33 am EST (0533 GMT). The Falcon 9's first stage, which debuted in May 2020 on the Demo-2 Crew Dragon mission that carried astronauts for the first time, still bore the faded NASA 'worm' logo from that occasion.

The veteran rocket performed flawlessly, delivering the 23 Starlink satellites to low Earth orbit (LEO) about 65.5 minutes after liftoff. The first stage also returned to Earth safely, landing on the drone ship Just Read the Instructions in the Atlantic Ocean about 8.5 minutes after launch. This was the 19th successful landing for this

booster, setting a new benchmark for reusability.

The launch was delayed by over an hour from the original window of 11 pm EST (0400 UTC) due to the late arrival of the rocket at the launch pad, which occurred around 7:35 pm EST (0035 UTC). SpaceX had backup launch opportunities until Saturday at 3 am EST (0800 UTC).

The weather conditions were favorable for the launch, with a 60-70 percent chance of acceptable weather, according to the 45th Weather Squadron at Cape Canaveral Space Force Station. The main concerns were the thick cloud layer and cumulus cloud rules.



### **8 years since SpaceX achieved its first-ever successful landing**

It has been exactly eight years since SpaceX achieved its first-ever successful landing of an orbital-class rocket. Since then, the company has continued to make significant strides in reusable rocket technology and has successfully landed Falcon rockets over 250 times and continues to do so.

SpaceX's Starlink project aims to provide high-speed internet access to remote areas using a constellation of thousands of satellites in LEO. The company announced this week that it has 2.3 million users in 70 countries and has launched 5,604 satellites since 2019, according to Jonathan McDowell, an astronomer at the

Harvard-Smithsonian Center for Astrophysics, who tracks space activities. As of December 20, 5,226 satellites were still in orbit, and 5,191 were functioning normally.

SpaceX's founder and CEO, Elon Musk, has a grand vision of colonizing Mars and exploring the solar system. To achieve this, he believes that rocket reusability is essential to lower costs and increase space missions' frequency. That's why SpaceX keeps pushing the limits of its Falcon 9 rockets, which have flown more than 90 orbital missions in 2023, mostly for Starlink. The previous record for the most flights by a Falcon 9 booster was 18, set just last month.





China to Launch World's First 'Lobster Eye' Space Telescope in Jan 2024

Headlines

- **Chinese 'Lobster Eye' Telescope:** China's Einstein Probe, inspired by a lobster's eye, launches in January 2024, equipped with innovative Wide-field X-ray Telescope (WXT) and Follow-up X-ray Telescope (FXT) to explore X-ray radiation from cosmic entities, collaborating with ESA and MPE.
- **Innovative X-ray Surveyor:** The Einstein Probe, set to be the first 'lobster eye' space telescope, revolutionizes space observation with WXT's expansive field, monitoring large sky areas in three orbits. It partners with ESA and MPE for comprehensive cosmic exploration.
- **Advancing Cosmic Understanding:** Designed to investigate X-ray sources, Einstein Probe contributes to gravitational wave studies. Its capabilities complement existing missions, acting as a precursor to ESA's NewAthena, the largest planned X-ray observatory, highlighting collaborative efforts in high-tech space exploration.

The telescope will hunt for powerful blasts of X-ray light coming from mysterious celestial objects. Designed to see X-rays in space, the Chinese Academy of Sciences (CAS) is finally sending its spacecraft Einstein Probe into space after months of speculation.

It's set to launch in January 2024. The telescope has new generations of instruments characterized by heightened sensitivity and an expansive observational field.

**Einstein Probe - Keeping an eye out**

The probe is inspired by the lobster's eye. The lobster's eye is special because it lets light come in from all directions. This light then reflects in the tubes and focuses on the retina.

Similarly, the Einstein Probe has special tools on board. These are the Wide-field X-ray Telescope (WXT) and the Follow-up X-ray Telescope (FXT). The WXT is designed like a lobster's eyes and uses Micro Pore Optics. This lets it look at a really big part of the sky, almost one-tenth of the whole sky at once - 3,600 square degrees.

With this, the Einstein Probe can keep an eye on almost all of the night sky in just three orbits around Earth, and each orbit takes about 96 minutes. The impending mission of the CAS spacecraft is poised to systematically scrutinize our celestial cosmos. Its primary objective is the discernment and investigation of X-ray radiation originating from cosmic entities, notably neutron stars and black holes, said the press release by the European Space Agency (ESA).

The Einstein Probe is not just a solo mission. The CAS is working together with the ESA and the Max Planck Institute for Extraterrestrial Physics (MPE) in Germany to make this mission happen. They're pooling their knowledge and resources to explore the secrets of the universe using the Einstein Probe.

"Thanks to its innovative design, Einstein Probe can monitor large swaths of the sky at a glance," said **Erik Kuulkers**, ESA's Einstein Probe Project Scientist. "In this way we can discover many new sources while at the same time study the behaviour of X-ray light coming from known celestial objects over long periods."



"The cosmos is our only laboratory to investigate the most energetic processes. Missions like Einstein Probe are essential to advance our understanding of these processes and to learn more about fundamental aspects of high-energy physics," added Kuulkers.

**High-tech Telescope**

The observation of fresh X-ray sources is of paramount importance in advancing our understanding of the genesis of gravitational waves. The soon-to-come Einstein Probe will be like a cosmic detective, trying to learn more about what's happening out there in space.

"Einstein Probe's capabilities are highly complementary to the in-depth studies of individual cosmic sources enabled by the other missions," remarks Kuulkers. "This X-ray surveyor is also the ideal precursor to ESA's NewAthena mission, currently under study and set to be the largest X-ray observatory ever built," he added.

ESA has been crucial in the creation of the Einstein Probe's scientific tools. They helped test and calibrate the X-ray detectors and the optics of WXT. ESA also collaborated with MPE and Media Lario (Italy) to develop the mirror assembly for one of FXT's two telescopes.

Google Announces India-First AI-Powered Experience for Maps

Headlines

- Google Maps, a ubiquitous navigation tool, is set to undergo a transformative upgrade in India with a host of new features leveraging artificial intelligence (AI).
- Google Maps, a ubiquitous navigation tool, is set to undergo a transformative upgrade in India with a host of new features leveraging artificial intelligence (AI).
- Miriam Karthika Daniel, Vice President of Google Maps Experiences, unveiled these innovations, emphasizing the goal of providing accessible and useful information about the real world to users.
- The main goal is to provide accessible and useful real-world information to users through AI-powered features.



In a first-of-its-kind initiative for India, Google plans to introduce the Address Descriptor early next year. This innovation aims to simplify location searches by offering a more intuitive experience. By automatically suggesting five landmarks in the vicinity when user drop a pin to share their location, Google enhances the visual mapping experience, moving beyond traditional latitude and longitude coordinates.

To meet evolving user expectations for a richer visual mapping experience, Google will launch lens in Maps in 15 cities by January 2024, starting with Android. This feature allows users to point their camera at the street to gather information about nearby businesses and establishments, providing a preview of a location before physically visiting it.

Building on the success of Street View, Live View Walking will be introduced in 15 cities, offering users a combination of Street View Data, AI and augmented reality (AR) technology. This feature overlays markers on the Maps screen to assist users in following directions more efficiently.

Google Maps takes a step towards sustainability by introducing the most fuel-efficient routes for two-wheelers. Identified by a green leaf icon, these routes aim to reduce carbon emissions. Since October 2021, the implementation of fuel-efficient in other regions has prevented 2.4 million metric tonnes of carbon emissions.

Google said its Where Is My Train app will now include real-time

train location, schematic maps, platform numbers, and more for local trains in Mumbai and Kolkata. Besides, Google announced partnership with ONDC and Namma Yatri to bring metro schedules and booking directly on Google Maps. This feature will roll out by mid 2024, starting with Kochi metro.

Google Maps is the most used navigation mobile application around the world including India. None of the competitors come close to offering a user-friendly interface to explore cities and even rural regions.

In the past several years, Google has incorporated Artificial Intelligence (AI)-powered features and this has helped around 30 million business owners. Most importantly, thanks to features such as business hours, photos, videos, and reviews.

Address Descriptors on Google Maps uses a combination of machine learning signals and AI, to offer at least five popular landmarks nearest to the pinned location. This way, users can reach the final destination with less hassle.



Meta and IBM Launch 'AI Alliance' to Promote Open-Source AI Development

Headlines

- Meta and IBM have joined forces to establish the AI Alliance to promote an “open-science” approach to AI development, setting them apart from competitors such as Google, Microsoft and Open AI.
- In a significant development within the artificial intelligence (AI) community, Meta and IBM have joined forces to establish the AI Alliance.
- Meta's chief AI scientific, Yann LeCun, has been vocal about his concerns regarding “massive corporate lobbying” by competitors like OpenAI, Google and Anthropic. He warns against rules that could favor their proprietary AI models.



The clash highlights the ongoing struggle between those favoring openness and those advocating for proprietary control.

The term “open-source” has its roots in the decades-old practice of building software with freely accessible code. However, in the realm of AI, defining open source is more complex, with debates over which components should be publicly available and the extent of use restrictions. OpenAI, despite its name, primarily develops closed AI systems, citing short-term and commercial incentives against open-sourcing. The argument encompasses concerns about safety and the potential risks of making highly advanced AI models publicly accessible.

In a significant development within the artificial intelligence (AI) community, Meta and IBM have joined forces to establish the AI Alliance. This aims to promote an “open-science” approach to AI development, setting them apart from competitors such as Google, Microsoft and Open AI. The crux of the debate revolves around whether AI technology should be developed in a manner that is widely accessible for kept proprietary, raising questions about safety, profit distribution and regulatory influence.

The recent executive order on AI by U.S. President Joe Biden has brought the open-source debate into the regulatory spotlight. The order acknowledges the benefits, giving the commerce secretary unit July to provide recommendations on managing these concerns. Meanwhile, the European Union is grappling with similar issues in the finalization of AI regulations, considering provisions that might exempt certain “free and open-source AI components” from commercial model regulations.

Led by IBM and Meta, the AI Alliance brings together industry heavyweights such as Dell, Sony, AMD, Intel and several universities and AI startups. The alliance emphasizes the importance of open scientific exchange, open innovation and the use of open-source technologies in shaping the future of AI. By taking an open-science stance, the alliance aims to ensure that AI development remains accessible and transparent, fostering collaboration and preventing concentration of power among a select few.



Meta's chief AI scientific, Yann LeCun warns against rules that could favor their proprietary AI models, potentially consolidating their influence over the technology's evolution. This sentiment aligns with the Frontier Model Forum, a group formed by Google, Microsoft, Open AI and Anthropic, advocating for a closed-source approach. The debate extends beyond safety concerns to the broader question of who benefits from the advancements in AI.

For IBM, a long-time supporter of open-source initiatives, this dispute echoes historical battles preceding the AI boom. Chris Padilla, leading IBM's global government affairs team, suggests that the closed-source approach resembles a “classic regulatory capture” strategy, reminiscent of Microsoft's historical opposition to open-source programs that could compete with its products.