SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Weekly Discovery

We SHARE to inspire and ignite ideas!

20 Oct - 24 Oct 2025

LinkedIn Learning Invest in Yourself

Did you know 1 cent doubled for 30 days = $5.368 Million

Similarly, your actions everyday can amount to much more!

Learn a new skill today with LinkedIn Learning and start investing in yourself!

Activate you free LinkedIn Learning Account and get started!

Featured Course

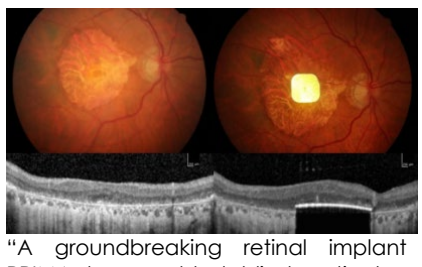
Copilot in Excel: Supercharge Your Productivity

13m

Click Here to Start Learning

AI

Tiny AI-powered eye implant helps the blind see again



"A groundbreaking retinal implant called PRIMA has enabled blind patients with dry AMD to read again. The chip, powered by light and paired with AR glasses, sends visual data directly to the brain. In clinical trials, most participants regained enough sight to read words and navigate daily life. This innovation represents a leap forward in artificial vision and patient independence."

Source: University College London (20 Oct 2025)

AI

90% of Science Is Lost: Frontiers' revolutionary AI-powered service transforms data sharing to deliver breakthroughs faster

"For every 100 datasets created, around 80 remain in the lab, 20 are shared but rarely reused, fewer than two meet FAIR standards, and only one typically drives new findings.

The result: delayed cancer treatments, climate models short on evidence, and research that cannot be reproduced.

Frontiers, the open-science publisher, is tackling this problem with the launch of Frontiers FAIR² Data Management, the world's first all-in-one, AI-powered service for research data. Designed to transform how data is shared so it is reusable and credited, it brings together curation, compliance checks, AI-ready packaging, peer review, an interactive portal, certification, and lifetime hosting in a single workflow — ensuring that research funded today delivers faster breakthroughs in health, sustainability, and technology tomorrow.

FAIR² extends the FAIR principles (Findable, Accessible, Interoperable, and Reusable) with an open specification that ensures every dataset is AI-ready and responsibly reusable by both humans and machines. Frontiers FAIR² Data Management is the first implementation, launched at a time when research outputs are growing exponentially and AI is reshaping discovery — turning principles into practical infrastructure for real-world impact at scale."

Source: Frontiers (13 Oct 2025)

AI

New study: AI chatbots systematically violate mental health ethics standards

"As more people turn to ChatGPT and other large language models (LLMs) for mental health advice, a new study details how these chatbots — even when prompted to use evidence-based psychotherapy techniques — systematically violate ethical standards of practice established by organizations like the American Psychological Association.

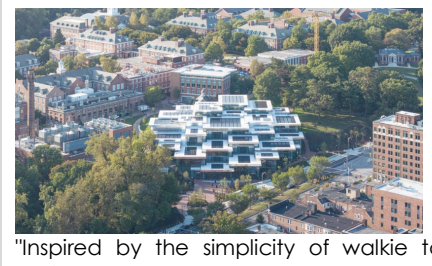
The research, led by Brown University computer scientists working side-by-side with mental health practitioners, showed that chatbots are prone to a variety of ethical violations. Those include inappropriately navigating crisis situations, providing misleading responses that reinforce users' negative beliefs about themselves and others, and creating a false sense of empathy with users.

"In this work, we present a practitioner-informed framework of 15 ethical risks to demonstrate how LLM counselors violate ethical standards in mental health practice by mapping the model's behavior to specific ethical violations," the researchers wrote in their study. "We call on future work to create ethical, educational and legal standards for LLM counselors — standards that are reflective of the quality and rigor of care required for human-facilitated psychotherapy."."

Source: Brown (21 Oct 2025)

ARCHITECTURE

BIG completes mass-timber "village of 29 pavilions" at Johns Hopkins



"Inspired by the simplicity of walkie talkies, design agency Pentagram has updated tech company Karri's smartphone for kids with new features intended to make communication "as intuitive as possible".

Designed for ages five to 13, the Karri messenger aims to give young people a way to chat with loved ones – without all the distractions that come with standard smart phones.

Children are able to use the SIM-operated device to send voice notes to parents or guardians, who can then listen and respond via the Karri app on their own smartphones.

The app can also show the location of a child, plus the Karri's battery level and network status. There's additionally the option to set up safe areas or "geo fences" for the child, and be notified should they move beyond these boundaries.

An enhanced version of the device is set to launch in early 2026."

Source: Dezeen (16 Oct 2025)

ARCHITECTURE

The Spatial Agency Gap: Rethinking Public Space through Co-Designing with Foreign Domestic Workers

"Domestic workers in Hong Kong and Singapore are the city's quiet infrastructure. In Hong Kong alone, there are a total of roughly 300,000 domestic workers, serving a portion of the approximate 2.7 million households. Their care labor sustains dual-income family routines: childcare, eldercare, cooking, cleaning, and the everyday logistics that make professional life possible. Yet the people who hold this balance together remain largely invisible in policy—and, crucially, in space.

On Sundays in Hong Kong's financial district, that invisibility becomes visible. Elevated walkways and podium forecourts—underused on weekends—turn into ad-hoc commons. With cardboard mats, small tents, towels, food and water, and a music speaker or two, domestic workers assemble places to sit, rest, and socialize. These improvised rooms in the city are often their only chance to exercise spatial agency—something they rarely have in the homes they maintain or in formal public infrastructure. In the absence of sanctioned, serviced places for rest, quieter bridges and passages become practical stand-ins.

Reactions to these gatherings diverge. Many recognize mutual care and community; others focus on hygiene, clutter, or nearby property interests. That debate often misses the structural reality: domestic work underwrites the wider economy. The relevant question is how to make this labor—and the people who do it—legible in the city's spatial policies. Designing from their perspective, or at minimum creating avenues for their authorship of space, offers a path toward social well-being and belonging rather than mere tolerance."

Source: Dezeen (20 Oct 2025)

CLIMATE CHANGE

'New reality' as world reaches first climate tipping point

"The world faces a "new reality" as we have reached the first of many Earth system tipping points that will cause catastrophic harm unless humanity takes urgent action, according to a landmark report released today (13 Oct) by the University of Exeter and international partners.

With ministers gathering today ahead of the COP30 summit, the second Global Tipping Points Report finds that warm-water coral reefs – on which nearly a billion people and a quarter of all marine life depend – are passing their tipping point. Widespread dieback is taking place and – unless global warming is reversed – extensive reefs as we know them will be lost, although small refuges may survive and must be protected.

We are on the brink of more tipping points, with devastating risks for people and nature: the irreversible melting of polar ice sheets, the collapse of key ocean currents and the dieback of the Amazon rainforest – where COP30 will be held.

With global warming set to breach 1.5°C, the report – by 160 scientists at 87 institutions in 23 countries – argues that countries must minimise temperature overshoot to avoid crossing more tipping points. Every fraction of a degree and every year spent above 1.5°C matters.

Action to trigger "positive tipping points" of self-propelling change – such as the rollout of green technologies – now offers the only credible route to a safe, just and sustainable future, the report says..."

Source: Exeter (11 Oct 2025)

HEALTH

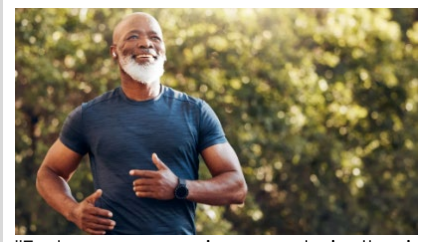
This simple innovation could change blood pressure testing forever

"Scientists from the University of Exeter has developed a precise method to interpret ankle blood pressure readings—an innovation that could transform care for people unable to have their arm blood pressure measured. By analyzing data from over 33,000 participants, researchers created an algorithm and online calculator that improves accuracy and could prevent thousands of misdiagnoses worldwide."

Source: Shenyang Agricultural University (8 Oct 2025)

HEALTH

Exercise might be the key to a younger, sharper immune system



"Endurance exercise may train the immune system as much as the muscles. Older adults with decades of running or cycling had immune cells that functioned better and aged more slowly. Their inflammation levels were lower and their cells resisted fatigue even under stress. The findings point to a direct link between lifelong fitness and healthier immune regulation.."

Source: Fundação de Amparo à Pesquisa do Estado de São Paulo (14 Oct 2025)

HEALTH

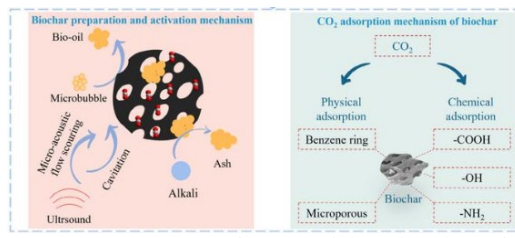
This common vitamin could cut your skin cancer risk in half

"A massive Veterans Affairs study has confirmed that nicotinamide may offer real protection against skin cancer. Patients who took the vitamin B3 derivative saw notable reductions in new cancer cases—especially squamous cell carcinomas. The findings could shift clinical thinking toward earlier, preventive use of nicotinamide, though it showed less benefit for transplant patients."

Source: Vanderbilt University (20 Oct 2025)

MATERIALS

New biochar-enhanced cement could lock away more carbon dioxide



"A research team from Hefei University of Technology, Zhejiang University, and South China University of Technology has discovered that adding specially treated biochar to cement can significantly improve its ability to capture and store carbon dioxide while strengthening the material itself.

Cement production is one of the world's largest sources of CO_2 emissions. Finding cost-effective ways to store carbon directly in building materials could help reduce the industry's environmental footprint. In the new study, scientists explored how modifying biochar, a porous carbon-rich material made from plant waste, can make cement more sustainable.

The researchers produced biochar by heating corn straw at different temperatures and separated its main component, called sedimented particles. Both the original and separated biochar samples were treated with an alkali solution to enhance their structure and tested for CO_2 adsorption. The team then mixed these biochars into cement at various proportions to evaluate their effects on strength and carbon capture.

The results revealed that the sedimented particles had a greater ability to trap CO_2 than untreated biochar, and that alkali modification further improved this capacity by refining the material's microscopic pore structure. Biochar produced at 500 ℃ performed the best overall, combining strong adsorption ability with improved cement performance.."

Source: Shenyang Agricultural University (11 Oct 2025)

SOLAR

Cambridge Scientists Unlock Century-Old Quantum Secret That Could Revolutionize Solar Power

"Cambridge scientists have uncovered a hidden quantum mechanism in an organic semiconductor that could revolutionize solar energy.

In a finding that connects modern research with ideas from a century ago, scientists have identified in an organic semiconductor a behavior that was long believed to occur only in inorganic metal oxides. The team led by the University of Cambridge reports a previously unrecognized way to convert light into electrical energy. This advance could reshape solar power and electronics by enabling lighter, cheaper, and simpler solar panels built from a single material.

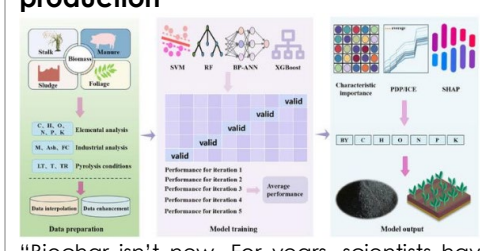
The research centers on a spin-radical organic semiconductor called P3TTM. A single unpaired electron sits at its core and gives the molecule distinctive magnetic and electronic properties. The project combines the synthetic chemistry group of Professor Hugo Bronstein in the Yusuf Hamied Department of Chemistry with the semiconductor physics group led by Professor Sir Richard Friend in the Department of Physics.

They have developed this class of molecules to give very efficient luminescence, as exploited in organic LEDs, but the new study, published in Nature Materials, reveals their hidden talent: when brought into close contact, their unpaired electrons interact in a manner strikingly similar to a Mott-Hubbard insulator.."

Source: SCITECH (Oct 2025)

SUSTAINABILITY

From data to dirt: Tianjin University of Commerce pioneers AI-powered breakthrough in sustainable biochar production



"Biochar isn't new. For years, scientists have celebrated it as a miracle material: a way to enrich soil, lock away carbon, and recycle organic waste through a process called pyrolysis—essentially, heating biomass without oxygen. But here's the catch: not all biochar is created equal. Its benefits depend on what it's made from (like rice husks or manure) and how it's made (especially the temperature). Until now, predicting its output has been more guesswork than science.

That's where Dr. Mu's team steps in—with algorithms, not just ash.

By analyzing 271 experimental datasets from global studies, the researchers trained four advanced machine learning models—Support Vector Regression, Random Forest, Artificial Neural Networks, and XGBoost—to predict biochar yield and nutrient composition with stunning accuracy. And when they added a smart twist—data augmentation using random noise injection—the results got even better.

The winner? XGBoost, a model known for speed and precision, delivered an average R^2 of 0.97, meaning it can predict biochar properties with near-perfect reliability.

"Biochar has enormous potential," says Dr. Lan Mu, corresponding author and mechanical engineering innovator at Tianjin University of Commerce. "But to scale it sustainably, we need more than intuition—we need intelligence. Our model turns complex variables into clear, actionable insights."."

Source: Shenyang Agricultural University (20 Oct 2025)

To view past Weekly Alerts CLICK HERE
For more articles or in-depth research, contact us at library@sutd.edu.sg