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AI

Using ChatGPT, Students Might Pass a Course, But with a Cost



“With the assumption that students are going to use artificial intelligence and large language models such as ChatGPT to do their homework, researchers in the Department of Aerospace Engineering in The Grainger College of Engineering, University of Illinois Urbana-Champaign set out to learn how well the free version of ChatGPT would compare with human students in a semester-long undergraduate control systems course.

The results: On straightforward math homework, ChatGPT got an A, but with some quirky answers. However, on higher-level problems that require reasoning, it got a D.

“We found ChatGPT technology can get an A on structured, straightforward questions. On open-ended questions it got a 62, brining ChatGPT’s semester grade down to an 82, a low B. The class average for the human students was 84.85 percent because they could handle the problems that required higher-level reasoning,” said Ph.D. student Gokul PuthumanaiIam.

The study concludes that a student who puts in minimal effort, showing no effort to learn the material, could use ChatGPT exclusively, get a B and pass the course. The problem is the passing grade might be the combination of A+ in simple math and D- in analysis. They haven’t learned much.”

Source: [EurekAlert!](#) (21 Apr 2025)

AI

Famed AI Researcher Launches Controversial Startup to Replace All Human Workers Everywhere



“Every now and then, a Silicon Valley startup launches with such an “absurdly” described mission that it’s difficult to discern if the startup is for real or just satire.

Such is the case with Mechanize, a startup whose founder — and the non-profit AI research organization he founded called Epoch — is being skewered on X after he announced it.

Complaints encompass both the startup’s mission, and the implication that it sullies the reputation of his well-respected research institute. (A director at the research institute even posted on X, “Yay just what I wanted for my bday: a comms crisis.”)

Mechanize was launched on Thursday via a post on X by its founder, famed AI researcher Tamay Besiroglu. The startup’s goal, Besiroglu wrote, is “the full automation of all work” and “the full automation of the economy.”

Does that mean Mechanize is working to replace every human worker with an AI agent bot? Essentially, yes. The startup wants to provide the data, evaluations, and digital environments to make worker automation of any job possible.

Besiroglu even calculated Mechanize’s total addressable market by aggregating all the wages humans are currently paid. “The market potential here is absurdly large: workers in the US are paid around \$18 trillion per year in aggregate. For the entire world, the number is over three times greater, around \$60 trillion per year,” he wrote.

Besiroglu did, however, clarify to TechCrunch that “our immediate focus is indeed on white-collar work” rather than manual labor jobs that would require robotics.”

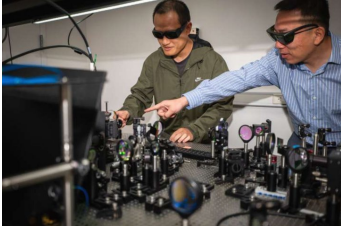
Source: [medium](#) (20 Apr 2025)



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AI & ENERGY

Programmable Photonic Chip Uses Light to Accelerate AI Training and Cut Energy Use



“Penn Engineers have developed the first programmable chip that can train nonlinear neural networks using light—a breakthrough that could dramatically speed up AI training, reduce energy use and even pave the way for fully light-powered computers.

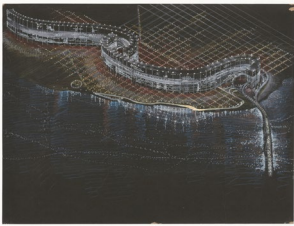
While today’s AI chips are electronic and rely on electricity to perform calculations, the new chip is photonic, meaning it uses beams of light instead. Described in Nature Photonics, the chip reshapes how light behaves to carry out the nonlinear mathematics at the heart of modern AI.

“Nonlinear functions are critical for training deep neural networks,” says Liang Feng, Professor in Materials Science and Engineering (MSE) and in Electrical and Systems Engineering (ESE), and the paper’s senior author. “Our aim was to make this happen in photonics for the first time.””

Source: [techxplore](#) (15 Apr 2025)

ARCHITECTURE

What Kind of City Will Humanity Need? Exploring Amancio Williams' Proposal for a Linear City



“Through his unbuilt projects, built works, and research, Amancio Williams’s ideas emerge as the result of a deep understanding of the most advanced trends of his time reflecting on architectural design, urbanism and city planning. By exploring various themes, concepts, and even materials, he aims to create a personal universe that interprets the present as something future-oriented, both international and distinctly Argentine. His proposal “La ciudad que necesita la humanidad” presents linear and layered buildings raised 30 meters above ground, incorporating everything from office spaces to roads and magnetic trains on different levels of a single structure. The Amancio Williams archive at the Canadian Centre for Architecture in Montreal documents Williams’ career as an architect and designer from the 1940s to the late 1980s. The fonds documents his work for over 80 architectural, urban planning and design projects, as well as the administration of his architecture practice and his professional activities. Including drawings and sketches, presentation models, photographic materials, such as photographs of models, finished project (when realized), reference images, photographic reproduction of plans, and site photographs, the archive is available to consult offering more details.”

Source: [Archdaily](#) (21 Apr 2025)

ARCHITECTURE

From Common Sight to Cultural Symbol: The Rise and Decline of Bamboo Scaffolding In Hong Kong

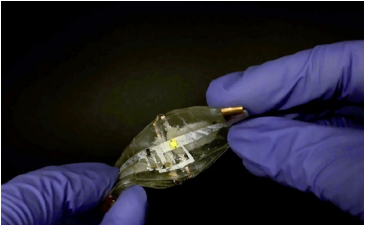


“The bamboo scaffolding building typology—temporary, agile, and deeply rooted in tradition—particularly, the bamboo shed theatre building technique, is recognized as an item of Intangible Cultural Heritage in Hong Kong. As one walks through the city, especially in busy urban districts, it’s nearly impossible not to encounter a bamboo scaffold within a five-minute radius. Bamboo scaffolding is arguably the most iconic construction material in Hong Kong, valued for its abundance, sustainability, flexibility, adaptability, and—most importantly—scalability. These qualities have contributed to its widespread use in temporary construction, from building maintenance and renovations to festival stages and sporting events.

However, this once-ubiquitous feature of the urban landscape may be slowly fading from view. A dwindling pool of skilled, younger workers—combined with evolving construction regulations—has contributed to its decline. On March 17, the Development Bureau announced plans to “drive a wider adoption of metal scaffolds in public building works.” In practice, this means the Architectural Services Department (ArchSD) will soon require at least 50% of its capital works projects to utilize metal scaffolding. While not a formal ban, the policy signals what many see as the beginning of a gradual phase-out of bamboo scaffolding in public-sector construction.”

BATTERIES

Stretchable Battery Can Survive Even Extreme Torture: The Lithium-Ion Battery Can Heal Itself After Being Cut in Half



“A new lithium-ion battery can not only withstand stretching and twisting, but can get stabbed with needles and cut in half with razor blades—and then heal itself to continue providing power to a device.

Wearable electronics, soft robots, and other devices could benefit from soft, stretchable lithium-ion batteries. However, most commercial lithium-ion batteries are hermetically sealed in rigid packages to keep out moisture that can degrade their performance, and to prevent toxic and flammable electrolytes from leaking out.

Previous research had investigated stretchable batteries that used hydrogels as their electrolytes. By using water as their solvent, these hydrogel batteries would prove nonflammable and less sensitive to moisture than commercial lithium-ion batteries. However, prior devices suffered from a number of limitations. Some only proved stable in relatively low voltages. Others depended on toxic, expensive flourine-loaded compounds.

In the new study, researchers developed a new water-based hydrogel lithium-ion battery that does not contain fluorine. “Many materials we used are non-standard to conventional lithium-ion batteries,” says Peisheng He, a postdoctoral researcher of mechanical engineering at the University of California, Berkeley. “We surmounted those challenges by learning lessons from unsuccessful trials, building and constantly improving fabrication and testing protocols.”

Previous stretchable batteries have proven sturdy, surviving twisting and even strikes from a hammer. The new battery displays another level of durability, not only enduring stretching,

BATTERIES

From Research to Real-World, Princeton Startup Tackles Soaring Demand for Lithium and Other Critical Minerals



“Tracing its roots to fundamental research conducted at Princeton, a new startup is upending decades-old approaches for the way the world extracts lithium and other materials, including nitrate and potash, that power today’s clean energy technologies and support modern agriculture.

The company, Princeton Critical Minerals (formerly PureLi), which emerged from the University’s ecosystem for innovation and entrepreneurship, has developed a technology for boosting minerals production from evaporation ponds. These ponds currently generate around 40% of the world’s lithium and most of its naturally occurring nitrate.

The technology is a black disc with a special, anti-fouling coating that floats on the ponds’ surface like a lily pad. It effectively doubles the amount of incoming sunlight converted to thermal energy, accelerating the evaporation process and mineral production.”

DESIGN

Konel's Nap-Inducing Robe Incorporates Music and Lighting to Lull Wearer to Sleep



“Japanese creative studio Konel has developed a sleepwear concept that uses embedded sound and lighting to promote sleep based on the wearer’s biometric data.

The ZZZN Sleep Apparel System was presented at Milan design week and developed in collaboration with data specialist NTT DX Partner and technology firm Soxai as part of a project aimed at improving sleeping habits in Japan.

Surveys have shown that its population gets the least sleep out of any country in the world.


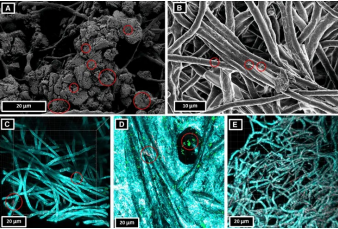
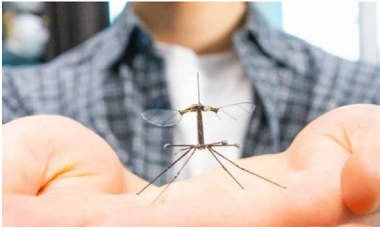

Konel’s concept hopes to remedy this by encouraging power naps – a long-established practice, which can help to improve alertness, mood and performance in people who aren’t sleeping enough at nighttime.

The sleepwear utilises real-time biometric data gathered using devices such as Soxai’s Ring 1 smart ring to monitor the wearer’s sleep patterns, stress levels and heart rate to determine their optimal sleeping environment.

“In today’s hyper-connected society, where we are always online, the time we spend truly offline – both mentally and physically – is rapidly shrinking,” Konel said.

“ZZZN Sleep Apparel System introduces a new approach to rest: disconnect to recover,” the studio suggested, adding that their data-driven approach “helps individuals to return naturally to health.”

The clothing incorporates technologies that help the wearer to fall asleep at the appropriate time, including built-in

<p>Source: Archdaily (20 Apr 2025)</p>	<p>twisting, and folding, but continuously powering a yellow light even while being repeatedly punctured with needles. In addition, “the battery can be cut in half, put together, and self-heal to still maintain more than 90 percent of its capacity,” says Liwei Lin, a professor of mechanical engineering at the University of California, Berkeley.”</p> <p>Source: IEEE Spectrum (21 Apr 2025)</p>	<p>Source: Princeton (18 Apr 2025)</p>	<p>headphones with noise cancellation.</p> <p>The headphones play calming music with sleep-inducing frequencies that are tailored to the user's stress levels in real time.</p> <p>The apparel also features lighting that produces a soft red glow, intended to mimic sunset hues and create a soothing effect.”</p> <p>Source: Dezeen (18 Apr 2025)</p>
<p>ENERGY</p> <p>A Step Toward Harnessing Clean Energy from Falling Rainwater</p>  <p>“When two materials come into contact, charged entities on their surfaces get a little nudge. This is how rubbing a balloon on the skin creates static electricity. Likewise, water flowing over some surfaces can gain or lose charge. Now, researchers reporting in ACS Central Science have harnessed the phenomenon to generate electricity from rain-like droplets moving through a tube. They demonstrate a new kind of flow that makes enough power to light 12 LEDs.</p> <p>“Water that falls through a vertical tube generates a substantial amount of electricity by using a specific pattern of water flow: plug flow,” says Siowling Soh, the study’s corresponding author. “This plug flow pattern could allow rain energy to be harvested for generating clean and renewable electricity.”</p> <p>When running water moves a turbine, it generates electricity. However, hydroelectricity is constrained to locations with large volumes of water, like rivers. For smaller and slower volumes of water, an alternative is to harness charge separation, a phenomenon that produces electrical charges as water moves through a channel with an electrically conductive inner surface. But charge separation is extremely inefficient because it is restricted to the surface that the water moves over. Previously, scientists have tried to improve its efficiency by making more surface area available through micro- or nanoscale channels for a continuous stream of water. However, water doesn’t naturally pass through such tiny channels, and if pumped, it requires more energy than gets generated. So, Soh, Chi Kit Ao and colleagues wanted to produce electricity using larger channels that rainwater could pass through...”</p> <p>Source: ACS (16 Apr 2025)</p>	<p>MATERIAL</p> <p>This Living Fungus-Based Building Material Can Repair Itself Over a Month</p>  <p>“Researchers in a laboratory in Montana have been growing a new kind of building material. It's not forged in a furnace or cast in molds, but carefully cultivated like a living organism.</p> <p>The breakthrough, published April 16 in Cell Reports Physical Science, uses scaffolds made from fungal mycelium — thread-like structures that fungi use to spread. These scaffolds are mineralized with the help of bacteria to produce self-healing, living materials that last for at least a month. And with further refinement, they might survive much longer.”</p> <p>Source: zmescience (16 Apr 2025)</p>	<p>ROBOTICS</p> <p>Robobee Comes in for a Landing</p>  <p>“Insect-scale robots can squeeze into places their larger counterparts can't, like deep into a collapsed building to search for survivors after an earthquake.</p> <p>However, as they move through the rubble, tiny crawling robots might encounter tall obstacles they can't climb over or slanted surfaces they will slide down. While aerial robots could avoid these hazards, the amount of energy required for flight would severely limit how far the robot can travel into the wreckage before it needs to return to base and recharge.</p> <p>To get the best of both locomotion methods, MIT researchers developed a hopping robot that can leap over tall obstacles and jump across slanted or uneven surfaces, while using far less energy than an aerial robot.</p> <p>The hopping robot, which is smaller than a human thumb and weighs less than a paperclip, has a springy leg that propels it off the ground, and four flapping-wing modules that give it lift and control its orientation.”</p> <p>Source: Harvard (16 Apr 2025)</p>	<p>SUSTAINABILITY</p> <p>What Is the Best Type of Tree to Use for Forest Restoration?</p>  <p>“The United Nations declared 2021–2030 to be the decade of ecosystem restoration, an initiative aiming to halt ecosystem degradation and restore 350 million hectares of forest (see go.nature.com/41uy171). To achieve this goal, efficient and scalable restoration strategies are needed. Planting trees is probably the most common approach, leading to a surge in the extent of tree plantations. In tree-planting projects, fast-growing species are often the preferred choice to deliver rapid returns. These species are usually selected on the basis of their potentially high rates of photosynthesis, the process that converts sunlight and carbon dioxide into sugars and wood. Writing in Nature, Augusto <i>et al.</i> show that such species (described as acquisitive) are outperformed in field trials by tree species that have a lower maximum rate of photosynthesis and are considered to use resources more conservatively (conservative species). This counter-intuitive finding has implications for the planning of forest restoration.</p> <p>Augusto and co-workers reach their remarkable conclusion by compiling results from more than 160 forest experiments around the globe. In each experiment, tree species were planted in blocks, creating a mosaic of forest patches of the same age and species. Some experiments were established up to 60 years ago. Tree heights were measured repeatedly to obtain growth rates. The growth rates for each species were then compared to the average for that experiment across all of the species planted. Species were categorized as being acquisitive or conservative (Fig. 1), mainly on the basis of their rate of photosynthesis. Augusto and colleagues classified all 223 tree species for all experiments studied.”</p> <p>Source: Nature (19 Mar 2025)</p>

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