

Weekly Discovery

We SHARE to inspire and ignite ideas!

7 Apr - 11 Apr 2025

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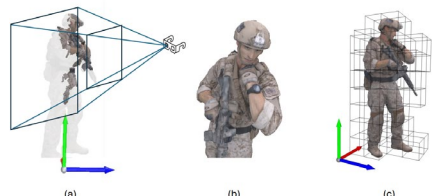
Featured Course

Design Thinking in the Age of AI 1h 10m

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3D STREAMING

3D Streaming Gets Leaner by Seeing Only What Matters



"A new approach to streaming technology may significantly improve how users experience virtual reality and augmented reality environments, according to a study from NYU Tandon School of Engineering.

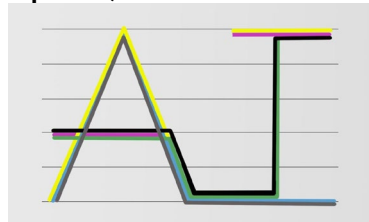
The research — presented in a paper at the 16th ACM Multimedia Systems Conference on April 1, 2025 — describes a method for directly predicting visible content in immersive 3D environments, potentially reducing bandwidth requirements by up to 7-fold while maintaining visual quality.

The technology is being applied in an ongoing NYU Tandon National Science Foundation-funded project to bring point cloud video to dance education, making 3D dance instruction streamable on standard devices with lower bandwidth requirements."

Source: [EurekAlert!](#) (9 Apr 2025)

AI

12 Graphs That Explain the State of AI In 2025: Stanford's AI Index Tracks Performance, Investment, Public Opinion, And More



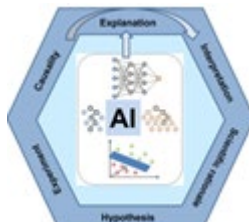
"If you read the news about AI, you may feel bombarded with conflicting messages: AI is booming. AI is a bubble. AI's current techniques and architectures will keep producing breakthroughs. AI is on an unsustainable path and needs radical new ideas. AI is going to take your job. AI is mostly good for turning your family photos into Studio Ghibli-style animated images.

Cutting through the confusion is the 2025 AI Index from Stanford University's Institute for Human-Centered Artificial Intelligence. The 400+ page report is stuffed with graphs and data on the topics of R&D, technical performance, responsible AI, economic impacts, science and medicine, policy, education, and public opinion. As IEEE Spectrum does every year (see our coverage from 2021, 2022, 2023, and 2024), we've read the whole thing and plucked out the graphs that we think tell the real story of AI right now."

Source: [IEEE Spectrum](#) (7 Apr 2025)

AI

How Can Science Benefit From AI?



"Researchers from chemistry, biology, and medicine are increasingly turning to AI models to develop new hypotheses. However, it is often unclear on which basis the algorithms come to their conclusions and to what extent they can be generalized. A publication by the University of Bonn now warns of misunderstandings in handling artificial intelligence. At the same time, it highlights the conditions under which researchers can most likely have confidence in the models. The study has now been published in the journal Cell Reports Physical Science.

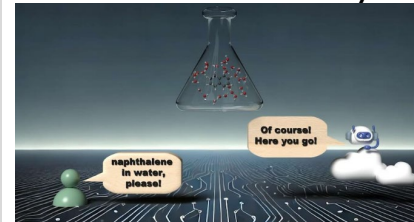
Adaptive machine learning algorithms are incredibly powerful. Nevertheless, they have a disadvantage: How machine learning models arrive at their predictions is often not apparent from the outside.

Suppose you feed artificial intelligence with photos of several thousand cars. If you now present it with a new image, it can usually identify reliably whether the picture also shows a car or not. But why is that? Has it really learned that a car has four wheels, a windshield, and an exhaust? Or is its decision based on criteria that are actually irrelevant — such as the antenna on the roof? If this were the case, it could also classify a radio as a car."

Source: [uni-bonn](#) (4 Apr 2025)

AI

Chatbot Opens Computational Chemistry to Nonexperts. New Tool Turns Simulating Molecules in Solution into A User-Friendly Chat



"Advanced computational software is streamlining quantum chemistry research by automating many of the processes of running molecular simulations. The complicated design of these software packages, however, often limits their use to theoretical chemists trained in specialized computing techniques.

A new web platform developed at Emory University overcomes this limitation with a user-friendly chatbot.

The chatbot guides nonexperts through a multistep process for setting up molecular simulations and visualizing molecules in solution. It enables any chemist — including undergraduate chemistry majors — to configure and execute complex quantum mechanical simulations through chatting.

The free, publicly available platform — known as [AutoSolvateWeb](#) — operates primarily on cloud infrastructure, further expanding access to sophisticated computational research tools."

Source: [emory](#) (26 Mar 2025)

ARCHITECTURE

Winners of the Archdaily China Building of The Year 2025 Awards



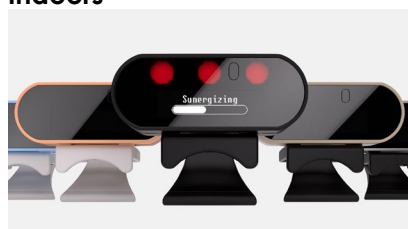
"This year we celebrate three projects, FUTIAN High-School Campus designed by reMIX studio won the first place. Futian High School Campus subverts the traditional convention of separating campuses from cities, breaking down boundaries and sharing resources between cities and schools. The rebuilt Futian Middle School attempts to provide a new type of campus that is "a city within a city". The Orchestra Park designed by SoBA won the second place. This community park offers spaces for viewing, leisure, and exploration, quickly becoming a favorite destination for local residents. With activities for all ages, it serves as both a natural retreat and a vibrant gathering place. Park - Tech (Zhongguancun Dongsheng Science Park Phase III) designed by SOPA won the third place. The project aims to create a "park complex" that coexists harmoniously with nature. Acting as a green link, the park provides open recreational spaces for citizens and achieves seamless integration between the city, architecture, and nature.

True to its status, ArchDaily China, the most far-reaching Chinese architectural website, is and will always be a platform for all architecture enthusiasts. Curating the best in the world, thanks to the trust of architectural firms and the devotion of our readers, ArchDaily's realm keeps expanding exponentially. For that, we are grateful!"

Source: [Archdaily](#) (9 Apr 2025)

DESIGN

Clip-On Sunbooster Uses Near-Infrared Leds to Bring Benefits of Sunlight Indoors



"Dutch tech start-up SunLED Life Science has developed a gadget that mimics sunlight and attaches to computer monitors and laptops to deliver near-infrared light to users while they work.

The SunBooster device, unveiled at the MWC Barcelona tech fair, promises to boost users' mental and physical health by providing the essential part of sunlight absent in indoor environments.

Near-infrared light (NIR) is an invisible part of the solar spectrum that makes up 50 per cent of sunlight and plays a vital role in helping humans feel happier, healthier and more energised."

Source: [Dezeen](#) (31 Mar 2025)

DESIGN

Six Statement Pieces That Blend Modern Aesthetics with Traditional Craftsmanship



"Dezeen Awards launched a new collectible design category this year. We've rounded up six limited-edition designs that could be entered into our new category.

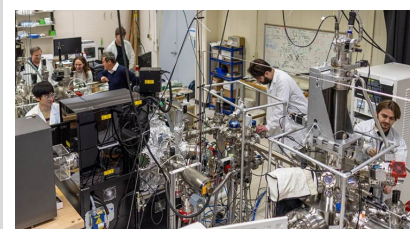
Often experimental in their approach, collectible designs apply a mixture between art and design, blending modern aesthetics with traditional craftsmanship. Many designers incorporate rich textures, bold colours, and recycled materials to create sculptural objects that balance visual appeal and functionality.

Below, we've collected six statement pieces that find new applications for everyday materials. From discarded aluminium and musical instruments to foil sweet rappers and mycelium, here's some inspiration for your entries."

Source: [Dezeen](#) (9 Apr 2025)

MATERIALS

Scientists Merge Two "Impossible" Materials into New Artificial Structure



"An international team led by Rutgers University-New Brunswick researchers has merged two lab-synthesized materials into a synthetic quantum structure once thought impossible to exist and produced an exotic structure expected to provide insights that could lead to new materials at the core of quantum computing.

The work, described in a cover story in the journal Nano Letters, explains how four years of continuous experimentation led to a novel method to design and build a unique, tiny sandwich composed of distinct atomic layers. One slice of the microscopic structure is made of dysprosium titanate, an inorganic compound used in nuclear reactors to trap radioactive materials and contain elusive magnetic monopole particles, while the other is composed of pyrochlore iridate, a new magnetic semimetal mainly used in today's experimental research due to its distinctive electronic, topological and magnetic properties.

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Source: [rutgers](#) (1 Apr 2025)

NANOPLASTICS

Researchers Discover Why Plastic Sheds Dangerous Fragments

QUANTUM NETWORKS

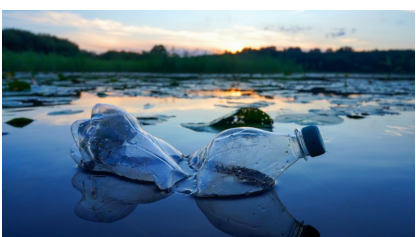
A Router for Photons. Transducer Could Enable Superconducting Quantum Networks

ROBOTICS

Nurture More Important Than Nature for Robotic Hands

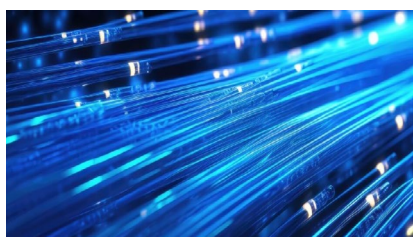
WEARABLE DEVICE

A Non-Contact Wearable Device for Monitoring Epidermal Molecular Flux



"In a paper published March 28 in Nature Communications, the researchers explain how nanoplastics form. They discovered that the process begins in the soft layers, which grow weaker over time due to environmental degradation and can break off even when the plastic is not under stress. By themselves, these soft pieces break down quickly in the environment. Problems arise when the failure of a soft layer allows hard layers to break off. These crystalline fragments are the nano- and microplastics that can persist in the environment for centuries and cause significant damage in living things, including humans."

Source: [columbia](#) (7 Apr 2025)

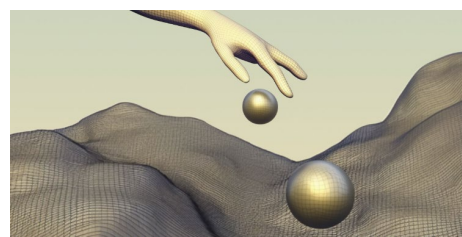


"Applied physicists at the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) have created a photon router that could plug into quantum networks to create robust optical interfaces for noise-sensitive microwave quantum computers.

The breakthrough is a crucial step toward someday realizing modular, distributed quantum computing networks that leverage existing telecommunications infrastructure. Comprising millions of miles of optical fiber, today's fiber-optic networks send information between computing clusters as pulses of light, or photons, all around the world in the blink of an eye.

Led by Marko Lončar, the Tiansai Lin Professor of Electrical Engineering and Applied Physics at SEAS, the team has created a microwave-optical quantum transducer, a device designed for quantum processing systems that use superconducting microwave qubits as their smallest units of operation (analogous to the 1s and 0s of classical bits). The research is published in [Nature Physics](#)."

Source: [harvard](#) (2 Apr 2025)

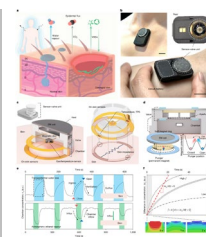


"How does a robotic arm or a prosthetic hand learn a complex task like grasping and rotating a ball? The challenge for the human, prosthetic or robotic hand has always been to correctly learn to control the fingers to exert forces on an object. The sensitive skin and nerve endings that cover our hands have been attributed with helping us learn and adapt our manipulation, so roboticists have insisted on incorporating sensors on robotic hands. But given that you can still learn to handle objects with gloves on- there must be something else at play.

This mystery is what inspired researchers in the ValeroLab in the Viterbi School of Engineering to explore if tactile sensation is really always necessary for learning to control the fingers. The researchers Romina Mir, Ali Marjaninejad, Andrew Erwin and Professor Francisco Valero-Cuevas within the Alfred Mann Department of Biomedical Engineering asked: how do the sensors that are part of the hand (its nature) interplay with how a hand is trained (nurtured) to learn complex tasks?

In a paper in the journal Science Advances, the team addresses the classic "nature versus nurture" question using computational modeling and machine learning. The paper "[Curriculum Is More Influential Than Haptic Information During Reinforcement Learning of Object Manipulation Against Gravity](#)" builds on the lab's previous work related to hand evolution and artificial intelligence. It demonstrates that the sequence of learning, also known as the "curriculum," is critical for learning to occur. In fact, the researchers note that if the curriculum takes place in a particular sequence, a simulated robotic hand can learn to manipulate with incomplete or even absent tactile sensation."

Source: [USC](#) (6 Apr 2025)



"Existing wearable technologies rely on physical coupling to the body to establish optical, fluidic, thermal and/or mechanical measurement interfaces. Here we present a class of wearable device platforms that instead relies on physical decoupling to define an enclosed chamber immediately adjacent to the skin surface. Streams of vaporized molecular substances that pass out of or into the skin alter the properties of the microclimate defined in this chamber in ways that can be precisely quantified using an integrated collection of wireless sensors. A programmable, bistable valve dynamically controls access to the surrounding environment, thereby creating a transient response that can be quantitatively related to the inward and outward fluxes of the targeted species by analysing the time-dependent readings from the sensors. The systems reported here offer unique capabilities in measuring the flux of water vapour, volatile organic compounds and carbon dioxide from various locations on the body, each with distinct relevance to clinical care and/or exposure to hazardous vapours. Studies of healing processes associated with dermal wounds in models of healthy and diabetic mice and of responses in models using infected wounds reveal characteristic flux variations that provide important insights, particularly in scenarios in which the non-contact operation of the devices avoids potential damage to fragile tissues."

Source: [Nature](#) (9 Apr 2025)

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