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9 Jun - 13 Jun 2025

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Medicine's Rapid Adoption of AI Has Researchers Concerned



"Artificial intelligence (AI) already helps clinicians to make diagnoses, triage critical cases and transcribe clinical notes in hospitals across the United States. But regulation of medical AI products has not kept up with the rapid pace of their adoption, argue researchers in a report published 5 June in PLOS Digital Health.

The authors point to limitations in how the US Food and Drug Administration (FDA) approves these devices, and propose broader strategies that extend beyond the agency to help ensure that medical AI tools are safe and effective.

More than 1,000 medical AI products have been cleared by the FDA, and hospitals are rapidly adopting them. Unlike most other FDAregulated products, AI tools continue to evolve after approval as they are updated or retrained on new data. This raises the need for continuous oversight, which current regulations have limited capacity to ensure.

The discussion is especially timely amid recent signs that the federal government might scale back AI regulation. In January, President Donald Trump revoked an executive order focused on AI safety, citing a need to remove barriers for innovation. The following month, lay-offs affected staff in the FDA's division responsible for AI and digital health.

Without proper oversight, there is a risk that medical algorithms could give misleading recommendations and compromise patient care. "There have to be safeguards," says Leo Anthony Celi, a clinical researcher at the Massachusetts Institute of Technology in Cambridge and a co-author of the report. "And I think relying on the FDA to come up with all those safeguards is not realistic and maybe even impossible."" Chatbot System Simulates Group Therapy to Manage Premenstrual Syndrome



"A research team has designed and implemented a group motivational interviewing system using multiple chatbots to support premenstrual syndrome (PMS), a common disorder among women. The system consists of chatbots serving as a facilitator or peers, which simulate a group counseling environment for PMS management. The study could provide valuable insights into the use of chatbots for group therapy to support women's health management and to address mental health issues.

The current findings are presented at the 2025 CHI Conference on Human Factors in Computing Systems held in Yokohama, Japan.

PMS is a disorder characterized by a variety of physical, emotional and behavioral symptoms that occur prior to menstruation, which experts estimate affects most women of reproductive age. For about 3-8% of them — which translates to tens of millions globally —it is severe enough that it is comparable to a chronic mood disorder characterized by mild depression (and only slightly less severe than major depressive disorder) that it impairs the way they function interpersonally or in the workplace.

In the current study, the research team, led by Associate Professor Koji Yatani at the University of Tokyo's Graduate School of Engineering, drew inspiration from the established benefits of group therapy to develop their group motivational interviewing system using multiple chatbots. A chatbot is a computer program that simulates human conversation so that humans can interact with digital devices similar to ways they communicate with a real person." Light And AI Drive Precise Motion in Soft Robotic Arm



"Researchers at Rice University have developed a soft robotic arm capable of performing complex tasks such as navigating around an obstacle or hitting a ball, guided and powered remotely by laser beams without any onboard electronics or wiring. The research could inform new ways to control implantable surgical devices or industrial machines that need to handle delicate objects.

According to the study published in Advanced Intelligent Systems, the new robotic system incorporates a neural network trained to predict the exact light pattern needed to create specific arm movements. This makes it easier for the robot to execute complex tasks without needing similarly complex input from an operator.

"This was the first demonstration of real-time, reconfigurable, automated control over a light-responsive material for a soft robotic arm," said Elizabeth Blackert, a Rice doctoral alumna who is the first author on the study.

Read more in their paper here."

Al Helping Machines Understand Visual Content With Al



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"Data should drive every decision a modern business makes. But most businesses have a massive blind spot: They don't know what's happening in their visual data.

Coactive is working to change that. The company, founded by Cody Coleman '13, MEng '15 and William Gaviria Rojas '13, has created an artificial intelligence-powered platform that can make sense of data like images, audio, and video to unlock new insights.

Coactive's platform can instantly search, organize, and analyze unstructured visual content to help businesses make faster, better decisions.

Coactive is already working with several large media and retail companies to help them understand their visual content without relying on manual sorting and tagging. That's helping them get the right content to users faster, remove explicit content from their platforms, and uncover how specific content influences user behavior.

More broadly, the founders believe Coactive serves as an example of how AI can empower humans to work more efficiently and solve new problems."

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Source: MIT News (9 Jun 2025)

Source: Nature (9 Jun 2025)

ARCHITECTURE Climate Research Lab Among AVIATION Look for These 7 New Technologies at

Source: EurekAlert! (2 Jun 2025)

HEALTHCARE No More Needles: This New Device

vice Disaster Awaits if We Don't Secure

Technology and Design Students



"Dezeen School Shows: a research laboratory for climate justice in the Pacific nation of Tuvalu is among the projects by students at Singapore University of Technology and Design.

Also featured is a project investigating concrete production using 3D printers and a toolkit for dementia patients to design their own homes.

Singapore University of Technology and Design

Institution: Singapore	University	of Technology
and		Design
Course: Master	of	Architecture
Tutor: Peter Ortner		

School statement:

"The masters of architecture programme at the Architecture and Sustainable Design (ASD) pillar represents the deep investigation into the technology and research infused design perused by Singapore University of Technology and Design (SUTD).

"This is an accelerated course held over three terms, principally comprising practice, studio and thesis elements.

"It is designed to orientate and focus students through a longer term thesis-based design methodology and project, and to realise new visions of novel creative and social design futures."

the Airport



"Take a look around the airport during your travels this summer and you might spot a string of new technologies at every touchpoint: from pre-arrival, bag drop, and security to the moment you board the plane.

In this new world, your face is your boarding pass, your electronic luggage tag transforms itself for each new flight, and gate scanners catch line cutters trying to sneak onto the plane early.

It isn't the future—it's now. Each of the technologies to follow is in use at airports around the world today, transforming your journey-before-the-journey.

Virtual queuing speeds up airport security

As you pack the night before your trip, you ponder the age-old travel question: What time should I get to the airport? The right answer requires predicting the length of the security line. But at some airports, you no longer have to guess; in fact, you don't have to wait in line at all.

Instead, you can book ahead and choose a specific time for your security screening—so you can arrive right before your reserved slot, confident that you'll be whisked to the front of the line, thanks to Copenhagen Optimization's Virtual Queuing system.

Copenhagen Optimization's machine learning models use linear regression, heuristic models, and other techniques to forecast the volume of passenger arrivals based on historical data. The system is integrated with airport programs to access flight schedules and passenger-flow data from boarding-pass scans, and it also takes in data from lidar sensors and cameras at Detects Health Risks from Thin Air



"Portable technology captures molecules in breath to support medical care, from managing diabetes to monitoring newborn development.

If you've ever waited at the doctor's office to give a blood sample, you might have wished there were a way to get the same information without using needles.

Despite many medical advances in the 20th century, detecting molecules has largely relied on liquid samples, such as blood. But new research from the University of Chicago may offer an alternative. A team of scientists has developed a small, portable device that can collect and detect molecules in the air—a breakthrough with potential applications across medicine and public health.

The device, called ABLE, could one day detect airborne viruses or bacteria in hospitals and public spaces, help monitor newborns, or allow people with diabetes to measure glucose through their breath. The entire unit measures just four by eight inches.

Read their article on <u>Nature Chemical</u> Engineering." the Next Cyberattack



"In 2015, Ukraine experienced a slew of unexpected power outages. Much of the country went dark. The U.S. investigation has concluded that this was due to a Russian state cyberattack on Ukrainian computers running critical infrastructure.

In the decade that followed, cyberattacks on critical infrastructure and near misses continued. In 2017, a nuclear power plant in Kansas was the subject of a Russian cyberattack. In 2021, Chinese state actors reportedly gained access to parts of the New York City subway computer system. Later in 2021, a cyberattack temporarily closed down beef processing plants. In 2023, Microsoft reported a cyberattack on its IT systems, likely by Chinese-backed actors.

The risk is growing, particularly when it comes to Internet of things (IoT) devices. Just below the veneer of popular fad gadgets (does anyone really want their refrigerator to automatically place orders for groceries?) is an increasing army of more prosaic Internetconnected devices that take care of keeping our world running. This is particularly true of a subclass called Industrial Internet of Things (IIoT), devices that implement our communication networks, or control infrastructure such as power grids or chemical plants. IIoT devices can be small devices like valves or sensors, but also can include very substantial pieces of gear, such as an HVAC system, an MRI machine, a dual-use aerial drone, an elevator, a nuclear centrifuge, or a jet engine.

The number of current IoT devices is growing rapidly. In 2019, there were an estimated 10 billion IoT devices in operation. At the end of

Source: <u>Dezeen</u> (9 Jun 2025)	security checkpoints, X-ray luggage scanners, and other areas." Source: <u>IEEE Spectrum</u> (4 Jun 2025)	Source: <u>Science Tech Daily</u> (9 Jun 2025)	2024, it had almost doubled to approximately 19 billion. This number is set to more than double again by 2030. Cyberattacks aimed at those devices, motivated either by political or financial gain, can cause very real physical-world damage to entire communities, far beyond damage to the device itself."
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PHYSICS Al-Designed Waveguides Pave the Way for Next-Generation Photonic Devices	ROBOTICS This "Robot Bird" Flies At 45 Mph Through Forests—With No GPS Or Light	ROBOTTICS IN HEALTHCARE China Turns to Robots for Elderly Care with National Pilot Programme	SOFT ROBOTS Robots Made of Linked Particle Chains
			A Single bot
"A team of researchers at the University of California, Los Angeles (UCLA) has introduced a novel framework for designing and creating universal diffractive waveguides that can complex ways. This new technology uses artificial intelligence (AI), specifically deep learning, to design a series of structured surfaces that guide light with high efficiency and can perform a wide range of functions that are challenging for conventional waveguides. The work is published in the journal <u>Nature</u> <u>Communications.</u> "	"Unlike birds, which navigate unknown environments with remarkable speed and agility, drones typically rely on external guidance or pre-mapped routes. However, a groundbreaking development by Professor Fu Zhang and researchers from the Department of Mechanical Engineering of Faculty of Engineering at the University of Hong Kong (HKU), has enabled drones and micro air vehicles (MAVs) to emulate the flight capabilities of birds more closely than ever before. Professor Zhang describes this invention as a game-changer in the field of drone technology, "Picture a 'Robot Bird' swiftly maneuvering through the forest, effortlessly dodging branches and obstacles at high speeds. This is a significant step forward in autonomous flight technology. Our system allows MAVs to navigate complex environments at high speeds with a level of safety previously unattainable. It's like giving the drone the reflexes of a bird, enabling it to dodge obstacles in real-time while racing toward its goal." The breakthrough lies in the sophisticated integration of hardware and software. SUPER utilizes a lightweight 3D light detection and ranging (LIDAR) sensor capable of detecting obstacles up to 70 meters away with pinpoint accuracy. This is paired with an advanced planning framework that generates two trajectories during flight: one that optimizing speed by venturing into unknown spaces and another prioritizing safety by remaining within known, obstacle-free zones."	"China has launched a pilot programme aimed at accelerating the deployment of robots to alleviate the pressure of elderly care, as the nation grapples with a rapidly ageing population and a labour shortage. The Ministry of Industry and Information Technology, in collaboration with the Ministry of Civil Affairs, issued a notice on Monday inviting organisations to participate in pilot projects. The initiative aims to enhance the integration of robotics into smart elderly care. The programme "primarily focuses on improving the quality of life for senior citizens, reducing the caregiving burden on families, addressing labour shortages in communities and institutional care, and enhancing the overall elderly care infrastructure", according to the notice. It outlines three areas of elderly care: home, community and institutional settings. Applications include assisting disabled or cognitively impaired people, providing emotional support, improving health, enabling smart homes and helping with daily activities."	"Coordinated behaviors like swarming – from ant colonies to schools of fish – are found everywhere in nature. Researchers at the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) have given a nod to nature with a next- generation robot system that's capable of movement, exploration, transport and cooperation. A study in Science Advances describing the new soft robotic system was co-led by L. Mahadevan, the Lola England de Valpine Professor of Applied Mathematics, Physics, and Organismic and Evolutionary Biology in SEAS and the Faculty of Arts and Sciences, in collaboration with Professor Ho-Young Kim at Seoul National University. Their work paves new directions for future, low-power swarm robotics. The new robots, called link-bots, are comprised of centimeter-scale, 3D-printed particles strung into V-shaped chains via notched links and are capable of coordinated, life-like movements without any embedded power or control systems. Each particle's legs are tilted to allow the bot to self-propel when placed on a uniformly vibrating surface. The chain-linked bots are inspired by ant colonies or groups of cells that exhibit what physicists call "emergent collective behavior" despite being composed of simple individual units. This is in contrast with traditional swarm robots, such as those made from drones or small individual robots, which typically rely on energy-intensive components like sensors, wireless communications, or control
Source: <u>Phys.Org</u> (9 Jun 2025)	Source: <u>ScienceDaily</u> (7 Jun 2025)	Source: <u>South China Morning Post</u> (9 Jun 2025)	Source: <u>Eurekalert!</u> (9 Jun 2025)

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