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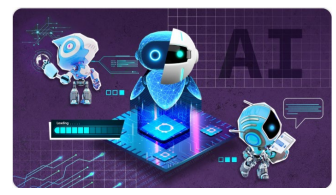

Featured Course

Introduction to Agentic AI: Getting Started with AutoGen Studio **1h 3m**

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AI

AI Chatbots Aren't Experts on Psych Med Reactions — Yet

"Asking artificial intelligence for advice can be tempting. Powered by large language models (LLMs), AI chatbots are available 24/7, are often free to use, and draw on troves of data to answer questions. Now, people with mental health conditions are asking AI for advice when experiencing potential side effects of psychiatric medicines — a decidedly higher-risk situation than asking it to summarize a report.

One question puzzling the AI research community is how AI performs when asked about mental health emergencies. Globally, including in the U.S., there is a significant gap in mental health treatment, with many individuals having limited to no access to mental healthcare. It's no surprise that people have started turning to AI chatbots with urgent health-related questions.

Now, researchers at the Georgia Institute of Technology have developed a new framework to evaluate how well AI chatbots can detect potential adverse drug reactions in chat conversations, and how closely their advice aligns with human experts. The study was led by Munmun De Choudhury, J.Z. Liang Associate Professor in the School of Interactive Computing, and Mohit Chandra, a third-year computer science Ph.D. student. De Choudhury is also a faculty member in the Georgia Tech Institute for People and Technology.

"People use AI chatbots for anything and everything," said Chandra, the study's first author. "When people have limited access to healthcare providers, they are increasingly likely to turn to AI agents to make sense of what's happening to them and what they can do to address their problem. We were curious how these tools would fare, given that mental health scenarios can be very subjective and nuanced."

De Choudhury, Chandra, and their colleagues introduced their new framework at the 2025 Annual Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics on April 29, 2025."

Source: EurekAlert! (27 May 2025)

AI

The Path for AI In Poor Nations Does Not Need to Be Paved with Billions

"Coinciding with US President Donald Trump's tour of Gulf states last week, Saudi Arabia announced that it is embarking on a large-scale artificial intelligence (AI) initiative. The proposed venture will have state backing and considerable involvement from US technology firms. It is the latest move in a global expansion of AI ambitions beyond the existing heartlands of the United States, China and Europe. However, as Nature India, Nature Africa and Nature Middle East report in a series of articles on AI in low- and middle-income countries (LMICs) published on 21 May (see go.nature.com/45jy3qq), the path to home-grown AI doesn't need to be paved with billions, or even hundreds of millions, of dollars, or depend exclusively on partners in Western nations or China.

Saudi Arabia's initiative is undoubtedly substantial. The country has established an AI company called HUMAIN in Riyadh, to be chaired by Prime Minister Mohammed bin Salman. Further details had not been made public by the time this Editorial went to press, although we do know that major US tech corporations are closely involved.

Chip-maker NVIDIA in Santa Clara, California, announced that it will supply "several hundred thousand" of its most advanced graphics processing units over five years. Qualcomm, a semiconductor manufacturer in San Diego, California, will build an AI data institute as well as a centre for semiconductor design. Cloud-computing company Amazon Web Services (AWS) in Seattle, Washington, will also be providing AI infrastructure. AWS has announced that it will train 100,000 people in AI and data science, and other firms will follow suit.

However, as a News Feature that appears in the series makes plain (see go.nature.com/3yrd3u2), many initiatives in LMICs aren't focusing on scaling up, but on 'scaling right'. They are "building models that work for local users, in their languages, and within their social and economic realities".

More such local initiatives are needed. Some of the most popular AI applications, such as OpenAI's ChatGPT and Google Gemini, are trained mainly on data in European languages. That would mean that the model is less effective for users who speak Hindi, Arabic, Swahili, Xhosa and countless other languages. Countries are boosting home-grown apps by funding start-up companies, establishing AI education programmes, building AI research and regulatory capacity and through public engagement.

Those LMICs that have started investing in AI began by establishing an AI strategy, including policies for AI research. However, as things stand, most of the 55 member states of the African Union and of the 22 members of the League of Arab States have not produced an AI strategy. That must change."

Source: Nature (21 May 2025)

ARCHITECTURE

The Tactile Twin – Why Models Still Matter in A Virtual World

"Building a monumental dome without the use of external iron chains or traditional centering was the enormous challenge faced by Filippo Brunelleschi at the Cathedral of Santa Maria del Fiore in Florence. To demonstrate the feasibility of his proposal and to guide the construction, he relied on a large-scale wooden model that played a fundamental role in studying proportions, the interlocking of ribs, and the innovative arrangement of bricks using the "a spina pesce" (herringbone) system. As an essential technical tool, this model — which is still on display at the Museo dell'Opera del Duomo in Florence — guided the master builders throughout the construction, establishing itself as a seminal example of the value of models in architectural planning, constructive communication, and experimentation.

Throughout history, various architects have used models as fundamental tools in the development of their projects. Antoni Gaudí, for instance, extensively relied on physical models to conceive the complex and organic forms of the Sagrada Família, using hanging models and plaster molds to study load distribution and structural geometry. In the 20th century, with the advent of modernism, the model gained an artistic and experimental status, explored by architects such as Le Corbusier, and Carlo Scarpa, who used it as a true material laboratory—a space where architectural theory confronted physicality, enabling sensory experimentation and material testing.

Today, in an increasingly digital world, materials are often pre-defined on screen, lacking the crucial tactile dimension fundamental to architecture. Models, however, continue to offer a tactile counterpoint, connecting imagination and materiality in a way no rendering can achieve. Prototypes allow architects to test unconventional ideas, explore the subtleties of physical textures, and rethink how digital visions translate into real environments. A remarkable example of this approach is the collaboration between facade manufacturer Sto and the London-based studio You+Pea, presented in the [ark] magazine and its online presence ark.sto.com. Under the headline Kaleidoscope the [ark] editors invited You+Pea to design their digital model and transform it into a full-scale physical installation."

Source: Archdaily (2 Jun 2025)

ARCHITECTURE

Immersive Children's Library Among Student Projects from Corcoran School of The Arts and Design

"Dezeen School Shows: an interactive library for children in a repurposed substation is among the interior architecture projects from students studying at the Corcoran School of the Arts and Design.

Also featured is a women's co-working space and a youth centre for children aged 12 to 16 in Virginia, US."

Source: Dezeen (2 Jun 2025)

DRONES

How Ukraine's Killer Drones Are Beating Russian Jamming

"Ukraine's 1 June attack on multiple Russian military bases destroyed or damaged as many as 41 Russian aircraft, including some of the country's most advanced bombers. Estimates of the sum total of the damage range from US $2 billion to $7 billion. Supposedly planned for a year and a half, the Ukrainian operation was exceptional in its sophistication: Ukrainian agents reportedly smuggled dozens of first-person-view attack drones into Russia on trucks, situating them close to the air bases where the target aircraft were vulnerable on tarmacs. The bases included one in Irkutsk, 4,300 kilometers from Ukraine, and another in south Murmansk, 1,800 km away. Remote pilots

ENVIRONMENT

Environmental DNA Floating in the Air Tracks Wildlife, Viruses — Even Drugs

"Dublin is known as a city where you can enjoy a few pints of Guinness, get a warm welcome from the locals and hear lively traditional music drifting out of pubs and into the city air.

But it's not just music floating on the breeze. The air of Dublin also contains cannabis, poppy, even magic mushrooms — at least their DNA.

That's according to a new study that reveals the power of environmental DNA, vacuumed up from the air, which can track everything from elusive bobcats to illicit drugs.

"The level of information that's available in environmental DNA is such that we're only

MEDICINE

Could 'Pausing' Cell Death Be the Final Frontier in Medicine on Earth and Beyond?

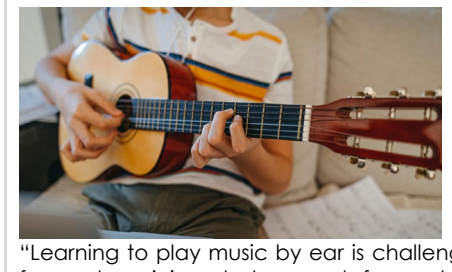
"In the study, published in Oncogene, a world-leading international team of scientists and clinicians explore the potential of necrosis – when cells die unexpectedly as a result of infection, injury or disease – to reshape our understanding and treatment of age-related conditions.

Challenging prevailing views, the paper brings together evidence from cancer biology, regenerative medicine, kidney disease, and space health to argue that necrosis is not merely an endpoint, but a key driver of aging that presents an opportunity for intervention.

Dr Keith Siew, an author of the study from UCL

MUSIC

Hitting The Right Notes to Play Music by Ear



"Learning to play music by ear is challenging for most musicians, but research from a team at the University of Waterloo may help musicians-in-training find the right notes.

The Waterloo team analyzed a range of YouTube videos that focused on learning music by ear and identified four simple ways music learning technology can better aid prospective musicians – helping people improve recall while listening, limiting playback to small chunks, identifying musical subsequences to memorize, and replaying notes indefinitely.

"There are a lot of apps and electronic tools

in Ukraine then launched the killer drones simultaneously.

The far-reaching operation was being hailed as the most inventive and bold of the war so far. Indeed, IEEE Spectrum has been regularly covering the ascent of Ukraine's military drone programs, both offensive and defensive, and for air, marine, and land missions. In this article, originally posted on April 6, we described another bold Ukrainian drone initiative, which was applying artificial intelligence-based navigational software to enable killer drones to navigate to targets even in the presence of heavy jamming.

After the Estonian startup KrattWorks dispatched the first batch of its Ghost Dragon ISR quadcopters to Ukraine in mid-2022, the company's officers thought they might have six months or so before they'd need to reconceive the drones in response to new battlefield realities. The 46-centimeter-wide flier was far more robust than the hobbyist-grade UAVs that came to define the early days of the drone war against Russia. But within a scant three months, the Estonian team realized their painstakingly fine-tuned device had already become obsolete."

Source: IEEE Spectrum (2 Jun 2025)

starting to consider what the potential applications can be, from humans, to wildlife to other species that have implications for human health," said David Duffy, Ph.D., a professor of wildlife disease genomics at the University of Florida and lead author of a new study showing the widespread utility of DNA vacuumed from the air.

Housed at UF's Whitney Laboratory for Marine Bioscience, Duffy's lab developed new methods for deciphering environmental DNA, also known as eDNA, to study sea turtle genetics. They've expanded the tools to study every species — including humans — from DNA captured in environmental samples like water, soil and sand.

But these errant strands of DNA do not just settle into muddy soil or flow along rivers. The air itself is infused with genetic material. A simple air filter running for hours, days or weeks can pick up signs of nearly every species that grows or wanders nearby."

Source: UFL (3 June 2025)

Centre for Kidney & Bladder Health, said: "Nobody really likes talking about death, even cell death, which is perhaps why the physiology of death is so poorly understood. And in a way necrosis is death. If enough cells die, then tissues die, then we die. The question is what would happen if we could pause or stop necrosis."

Dr Carina Kern, lead author of the study and CEO of LinkGevity, a biotech company based at Cambridge's Babraham Research Campus and part of the NASA Space-Health program, said: "Necrosis remains one of the last frontiers in medicine – a common thread across aging, disease, space biology, and scientific progress itself."

Cells are the fundamental building blocks of life and can die in various ways. 'Programmed' forms of cell death are beneficial, carefully orchestrated processes that allow our tissues to replenish themselves and function well throughout life.

But 'unprogrammed' cell death, or necrosis, is an uncontrolled and catastrophic process that leads to tissue degeneration and biological decline."

Source: UCL (29 May 2025)

out there to help learn by ear from recorded music," said Christopher Liscio, a recent Waterloo master's graduate in computer science and the study's lead author.

"But we see evidence that musicians don't appear to use them very much, which makes us question whether these tools are truly well-suited to the task. By studying how people teach and learn how to play music by ear in YouTube videos, we can try to understand what might actually help these ear-learning musicians."

Source: uwaterloo (27 May 2025)

ROBOTS

Robots Are Starting to Make Decisions in the Operating Room

"Here's a scene from the not-too-distant future. In a bright, high-tech operating room, a sleek robotic arm stands poised next to the operating table. The autonomous robot won't operate completely alone, but it will assist in the upcoming procedure, performing key tasks independently with enhanced precision and reduced risk.

Its patient is one of more than 150,000 patients diagnosed with colon cancer in the United States alone each year. The only curative treatment is to remove the diseased part of the colon—ideally in a minimally invasive laparoscopic procedure, performed with surgical tools and a thin camera inserted through small incisions. But the surgery tends to be challenging. The surgeon's skills, experience, and technique are the most important factors influencing surgical outcomes and complications, which occur in up to 16 percent of cases. These complications can diminish the patient's quality of life and increase the risk of death. The hope is that an autonomous surgical robot will improve these odds.

During surgery, this robot will perform tasks that require the utmost accuracy. The surgeon will first control its motions by hand to remove the cancerous tissue, then supervise the robot's motion as it independently sews the remaining healthy colon back together. Using several forms of imaging and real-time surgical planning, the robot will place each stitch with submillimeter precision, a feat not possible with human hands. As a result, the resulting suture line will be stronger and more uniform, making it less likely to leak, a dangerous complication that can occur when the connection doesn't heal properly."

Source: IEEE Spectrum (21 May 2025)

ROBOTS

Mid-Air Transformation Helps Flying, Rolling Robot to Transition Smoothly

"Ukraine's 1 June attack on multiple Russian military bases destroyed or damaged as many as 41 Russian aircraft, including some of the country's most advanced bombers. Estimates of the sum total of the damage range from US $2 billion to $7 billion. Supposedly planned for a year and a half, the Ukrainian operation was exceptional in its sophistication: Ukrainian agents reportedly smuggled dozens of first-person-view attack drones into Russia on trucks, situating them close to the air bases where the target aircraft were vulnerable on tarmacs. The bases included one in Irkutsk, 4,300 kilometers from Ukraine, and another in south Murmansk, 1,800 km away. Remote pilots in Ukraine then launched the killer drones simultaneously.

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Source: Caltech (28 May 2025)

ROBOTS

Horses 'Mane' Inspiration for New Generation of Social Robots

"Equine-Assisted Interventions (EAIs) offer a powerful alternative to traditional talking therapies for patients with PTSD, trauma and autism, who struggle to express and regulate emotions through words alone.

The study, presented at the CHI '25: Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems held in Yokohama, recommends that therapeutic robots should also exhibit a level of autonomy, rather than one-dimensional displays of friendship and compliance.

Lead author Ellen Weir from Bristol's Faculty of Science and Engineering explains: "Most social robots today are designed to be obedient and predictable - following commands and prioritising user comfort.

"Our research challenges this assumption."

In EAIs, individuals communicate with horses through body language and emotional energy. If someone is tense or unregulated, the horse resists their cues. When the individual becomes calm, clear, and confident, the horse responds positively. This 'living mirror' effect helps participants recognise and adjust their emotional states, improving both internal well-being and social interactions."

Source: Bristol (29 May 2025)

SUSTAINABILITY

Virginia Tech Researchers Develop Recyclable, Healable Electronics

"Michael Bartlett, associate professor of mechanical engineering, and Josh Worch, assistant professor of chemistry, come from different fields, but together they created a new class of circuit materials. With significant work from their team of postdoctoral and graduate student researchers, including Dong Hae Ho, Meng Jiang, and Ravi Tutika, the new circuits are recyclable, electrically conductive, reconfigurable, and self-healing after damage. Yet they retain the strength and durability of traditional circuit board plastics — features rarely found together in a single material.

The new material starts with a vitrimer, a dynamic polymer that can be reshaped and recycled. This versatile material is combined with droplets of liquid metal that do the work of carrying the electric current, the way rigid metals do in a traditional circuit.

This is a fundamentally different approach from other recyclable or flexible electronics. By combining the high-performance, adaptable polymers with electrically conductive liquid metals, the new circuit holds up under a host of challenges.

"Our material is unlike conventional electronic composites," said Bartlett. "The circuit boards are remarkably resilient and functional. Even under mechanical deformation or damage, they still work."

Source: VT (2 June 2025)