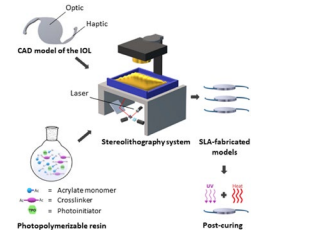


3D PRINTING

Innovative 3D Printing Could Revolutionise Treatment for Cataracts and Other Eye Conditions



“University of East Anglia researchers have made a significant breakthrough in ocular device technology with the introduction of a novel resin for 3D printing intraocular devices. This innovation has potential to enhance the manufacture of eye implants universally used in cataract and refractive surgeries.

An artificial intraocular lens (IOL) is primarily required for people with cataracts, a condition where the eye’s natural lens becomes cloudy, obscuring vision.

They can also be also used to correct refractive errors such as myopia (nearsightedness), hyperopia (farsightedness) and presbyopia (when eyes gradually lose the ability to see things clearly up close, as a normal part of aging).

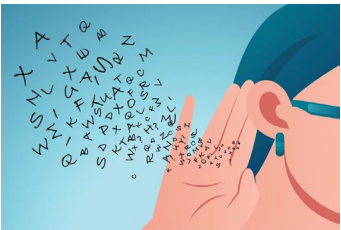
Lead author Dr Aram Saeed, Associate Professor in Healthcare Technologies at UEA’s School of Pharmacy, said: “For the first time, we have developed a resin that can be used to print ocular devices directly.

“While still in the early stages, the ability to 3D print these lenses could significantly enhance eye care for patients by offering unprecedented levels of customisation and design precision, potentially leading to better clinical outcomes.”

Source: [Furekalert!](#) (19 May 2024)

AI

Chatbots Tell Us What We Want to Hear



“Chatbots share limited information, reinforce ideologies, and, as a result, can lead to more polarized thinking when it comes to controversial issues, according to new Johns Hopkins University-led research.

The study challenges perceptions that chatbots are impartial and provides insight into how using conversational search systems could widen the public divide on hot-button issues and leave people vulnerable to manipulation.

“Because people are reading a summary paragraph generated by AI, they think they’re getting unbiased, fact-based answers,” said lead author Ziang Xiao, an assistant professor of computer science in the Whiting School of Engineering at Johns Hopkins who studies human-AI interactions. “Even if a chatbot isn’t designed to be biased, its answers reflect the biases or leanings of the person asking the questions. So really, people are getting the answers they want to hear.”

Source: [JHU](#) (14 May 2024)

AI

New AI Tool To Help Beat Brain Tumours



“A new AI tool to more quickly and accurately classify brain tumours has been developed by researchers at The Australian National University (ANU).

According to Dr Danh-Tai Hoang, precision in diagnosing and categorising tumours is crucial for effective patient treatment.

“The current gold standard for identifying different kinds of brain tumours is DNA methylation-based profiling,” Dr Hoang said.

“DNA methylation acts like a switch to control gene activity, and which genes are turned on or off.

“But the time it takes to do this kind of testing can be a major drawback, often requiring several weeks or more when patients might be relying on quick decisions on therapies.

“There’s also a lack of availability of these tests in nearly all hospitals worldwide.”

To address these challenges, the ANU researchers, in collaboration with experts from the National Cancer Institute in the United States (US), developed DEPLOY, a way to predict DNA methylation and subsequently classify brain tumours into 10 major subtypes.”

Source: [ANU](#) (20 May 2024)

AI

Researchers Wrestle with Accuracy of AI Technology Used to Create New Drug Candidates



“Artificial intelligence (AI) has numerous applications in healthcare, from analyzing medical imaging to optimizing the execution of clinical trials, and even facilitating drug discovery.

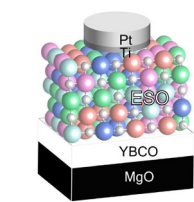
AlphaFold2, an artificial intelligence system that predicts protein structures, has made it possible for scientists to identify and conjure an almost infinite number of drug candidates for the treatment of neuropsychiatric disorders. However recent studies have sown doubt about the accuracy of AlphaFold2 in modeling ligand binding sites, the areas on proteins where drugs attach and begin signaling inside cells to cause a therapeutic effect, as well as possible side effects.

In a new paper, Bryan Roth, MD, PhD, the Michael Hooker Distinguished Professor of Pharmacology and director of the NIMH Psychoactive Drug Screening Program at the University of North Carolina School of Medicine, and colleagues at UCSF, Stanford, and Harvard determined that AlphaFold2 can yield accurate results for ligand binding structures, even when the technology has nothing to go off of. Their results were published in [Science](#).”

Source: [unhealthcare](#) (16 May 2024)

AI

AI Chips Could Get a Sense of Time



“Artificial neural networks may soon be able to process time-dependent information, such as audio and video data, more efficiently. The first memristor with a ‘relaxation time’ that can be tuned is reported today in Nature Electronics, in a study led by the University of Michigan.

Memristors, electrical components that store information in their electrical resistance, could reduce AI’s energy needs by about a factor of 90 compared to today’s graphical processing units. Already, AI is projected to account for about half a percent of the world’s total electricity consumption in 2027, and that has the potential to balloon as more companies sell and use AI tools.

“Right now, there’s a lot of interest in AI, but to process bigger and more interesting data, the approach is to increase the network size. That’s not very efficient,” said Wei Lu, the James R. Mellor Professor of Engineering at U-M and co-corresponding author of the study with John Heron, U-M associate professor of materials science and engineering.

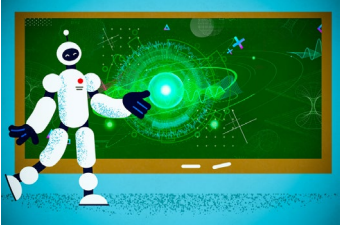
The problem is that GPUs operate very differently from the artificial neural networks that run the AI algorithms—the whole network and all its interactions must be sequentially loaded from the external memory, which consumes both time and energy. In contrast, memristors offer energy savings because they mimic key aspects of the way that both artificial and biological neural networks function without external memory. To an extent, the memristor network can embody the artificial neural network.

“We anticipate that our brand-new material system could improve the energy efficiency of AI chips six times over the state-of-the-art material without varying time constants,” said Sieun Chae, a recent U-M Ph.D. graduate in materials science and engineering and co-first-author of the study with Sangmin Yoo, a recent U-M PhD graduate in electrical and computer engineering.”

Source: [UMICH](#) (20 May 2024)

AI

Scientists Use Generative AI To Answer Complex Questions in Physics



“When water freezes, it transitions from a liquid phase to a solid phase, resulting in a drastic change in properties like density and volume. Phase transitions in water are so common most of us probably don’t even think about them, but phase transitions in novel materials or complex physical systems are an important area of study.

To fully understand these systems, scientists must be able to recognize phases and detect the transitions between. But how to quantify phase changes in an unknown system is often unclear, especially when data are scarce.

Researchers from MIT and the University of Basel in Switzerland applied generative artificial intelligence models to this problem, developing a new machine-learning framework that can automatically map out phase diagrams for novel physical systems.

Their physics-informed machine-learning approach is more efficient than laborious, manual techniques which rely on theoretical expertise. Importantly, because their approach leverages generative models, it does not require huge, labeled training datasets used in other machine-learning techniques.

Such a framework could help scientists investigate the thermodynamic properties of novel materials or detect entanglement in quantum systems, for instance. Ultimately, this technique could make it possible for scientists to discover unknown phases of matter autonomously.”

Source: [MIT](#) (16 May 2024)

AR

Augmented Reality Slims Down with AI And Holograms



“Augmented-reality glasses can upgrade our view of the world with digital images and data. However, even industry titans such as Google and Microsoft have failed to devise augmented-reality headsets that aren’t bulky, cause headaches, or both. Now, with a combination of 3D holograms, artificial intelligence, and the kind of physics that make invisibility cloaks possible, researchers have developed a wearable full-color 3D AR display as comfortable to wear as eyeglasses, a new study finds.

Whereas virtual reality (VR) headsets envelop a person’s field of vision, blocking their view of the real world, augmented reality (AR) headsets superimpose images onto the real world to create a mixed reality. Potential applications may include remote assistance for home repairs and other tasks, or displaying maps, directions, and other data to help users reach their destinations, find places to shop, or learn more about their surroundings.”

Source: [IEEE Spectrum](#) (8 May 2024)

ARCHITECTURE

Floods In Rio Grande Do Sul: The Tragedy of Non-Resilient Cities



“The world has changed, and accepting this fact is no longer a matter of choice but survival. Our rainfall patterns, periods of drought, average temperatures, sea levels—everything is in constant flux. The denialist stance of many countries, including Brazil, has led to catastrophic situations like the one we are facing now.

The floods that devastated the southern region of the country in recent days cannot be considered isolated incidents. Due to global warming, climate events like this will become increasingly frequent. In other words, unfortunately, we cannot prevent them from happening, but we can—and must—make our cities more resilient to these situations.

A total of 336 municipalities in the state of Rio Grande do Sul are currently declared disaster areas, with the tragedy claiming over 80 lives thus far. More than one million properties are without electricity. Families, stranded for a week without access to clean water, food, or medicine, are now being rescued. Volunteers from across the country are mobilizing to the south, bringing boats and kayaks to aid in search and rescue efforts for people and animals. Fundraising campaigns for money, clothing, and food are being widely promoted. It’s difficult for any Brazilian to remain uninformed about this situation.”

Source: [Archdaily](#) (18 May 2024)

CHATGPT

How Does ChatGPT ‘Think’? Psychology And Neuroscience Crack Open AI Large Language Models



“David Bau is very familiar with the idea that

DESIGN

Eight Highlights from Designmarch 2024 In Iceland



“Each year at DesignMarch, Iceland sets out to

ROBOTICS

Robots With Knives



“Cooking robots can enhance the home

ROBOTS

Robot-Phobia Could Exacerbate Hotel, Restaurant Labor Shortage



“Using more robots to close labor gaps in the

computer systems are becoming so complicated it's hard to keep track of how they operate. "I spent 20 years as a software engineer, working on really complex systems. And there's always this problem," says Bau, a computer scientist at Northeastern University in Boston, Massachusetts. But with conventional software, someone with inside knowledge can usually deduce what's going on, Bau says. If a website's ranking drops in a Google search, for example, someone at Google — where Bau worked for a dozen years — will have a good idea why. "Here's what really terrifies me" about the current breed of artificial intelligence (AI), he says: "there is no such understanding", even among the people building it. The latest wave of AI relies heavily on machine learning, in which software identifies patterns in data on its own, without being given any predetermined rules as to how to organize or classify the information. These patterns can be inscrutable to humans. The most advanced machine-learning systems use neural networks: software inspired by the architecture of the brain. They simulate layers of neurons, which transform information as it passes from layer to layer. As in human brains, these networks strengthen and weaken neural connections as they learn, but it's hard to see why certain connections are affected. As a result, researchers often talk about AI as 'black boxes', the inner workings of which are a mystery." Source: Nature (14 May 2024)	prove that being a remote island with a tiny population isn't a barrier to having a thriving design scene. Here, Dezeen rounds up the highlights of the 2024 festival. DesignMarch is Iceland's biggest design festival, with more than 100 exhibitions taking place across Reykjavík over five days. Despite its name, DesignMarch hasn't taken place in March since before the pandemic. Held in late April, this year's festival coincided with Iceland's official first day of summer – and locals were out in full force amid the rare clement weather to pack out the programmed events." Source: Dezeen (15 May 2024)	experience by reducing the burden of daily chores. However, these robots must perform their tasks dexterously and safely in shared human environments, especially when handling dangerous tools such as kitchen knives. This study focuses on enabling a robot to autonomously and safely learn food-cutting tasks. More specifically, our goal is to enable a collaborative robot or industrial robot arm to perform food-slicing tasks by adapting to varying material properties using compliance control. Our approach involves using Reinforcement Learning (RL) to train a robot to compliantly manipulate a knife, by reducing the contact forces exerted by the food items and by the cutting board. However, training the robot in the real world can be inefficient, and dangerous, and result in a lot of food waste. Therefore, we proposed SlicetIt!, a framework for safely and efficiently learning robot food-slicing tasks in simulation. Following a real2sim2real approach, our framework consists of collecting a few real food slicing data, calibrating our dual simulation environment (a high-fidelity cutting simulator and a robotic simulator), learning compliant control policies on the calibrated simulation environment, and finally, deploying the policies on the real robot." Source: IEEE Spectrum (17 May 2024)	hospitality industry may backfire and cause more human workers to quit, according to a Washington State University study. The study, involving more than 620 lodging and food service employees, found that "robot-phobia" — specifically the fear that robots and technology will take human jobs — increased workers' job insecurity and stress, leading to greater intentions to leave their jobs. The impact was more pronounced with employees who had real experience working with robotic technology. It also affected managers in addition to frontline workers. The findings were published in the International Journal of Contemporary Hospitality Management. "The turnover rate in the hospitality industry ranks among the highest across all non-farm sectors, so this is an issue that companies need to take seriously," said lead author Bamboo Chen, a hospitality researcher in WSU's Carson College of Business. "The findings seem to be consistent across sectors and across both frontline employees and managers. For everyone, regardless of their position or sector, robot-phobia has a real impact." Source: WSU (20 May 2024)
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