SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Weekly Discovery

We SHARE to inspire and ignite ideas!

24 - 28 April 2023

ARTIFICIAL INTELLIGENCE

ChatGPT, Can You Tell Me a Story?

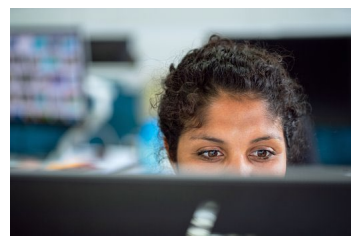
"From the intersection of computational science and technological speculation, with boundaries limited only by our ability to imagine what could be."

"As generative AI tools continue to overwhelm "future of technology" discussions at every level, Communications' Senior Editor Ralph Raiola thought it might be interesting to collaborate with OpenAI's ChatGPT on an original sci-fi short story."

Source: ACM (21 April 2023)

CAREER PATHS IN COMPUTING

A Career Built on Using Technology to Help Others



"If I reflect on the most valuable aspect of my CS education, I'd have to say it was HCI. I was also lucky to do my Ph.D. in a multidisciplinary research group that included software engineers, ethnographers, and philosophers. Because of these influences, I'm able to understand and communicate the potential impact of appropriately designed technology, while also being equipped to challenge the often-unsubstantiated claims of techno-solutionism in the public and social sectors."

Source: ACM (21 April 2023)

CLIMATE CHANGE

This Technology Could Alter the Entire Planet. These Groups Want Every Nation to Have a Say.

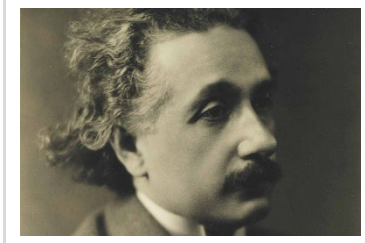
"Climate change will exact the steepest toll on the hottest and poorest parts of the world because higher temperatures in those areas threaten to push conditions beyond what's sustainable for crops or safe for humans and animals. These regions also often lack the resources to counteract the dangers of extreme heat waves, rising ocean levels, droughts, flooding, and more through climate adaptation measures like desalination plants, seawalls, or even air conditioners.

For some proponents of geoengineering research, the fact that climate dangers driven by emissions in rich nations fall overwhelmingly on poor ones creates a "moral obligation" to at least explore the possibility."

Source: MIT Technology Review (17 April 2023)

EDUCATION

In Search of Einstein's Brain



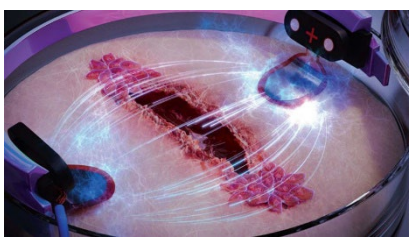
"When Albert Einstein died of an aortic aneurysm on April 18, 1955, the Princeton Hospital pathologist on duty, Thomas Harvey, removed the great man's brain. Harvey, acting without the family's permission, seemed to think the brainiac's grey matter would reveal the anatomy of genius—if only somebody could uncover it.

Mathematician Brian D. Burrell, despairing of his calculus students bemoaning that they aren't "Einsteins," writes about the tradition of examining the brains of intellectuals in the search for intelligence. He explores the surprising travels and travails of Einstein's brain, "a fate this is at once strange, sad, and fraught with ethical complications.""

Source: JSTOR (23 April 2023)

HEALTHCARE

How Electricity Can Heal Wounds Three Times as Fast



"Chronic wounds are a major health problem for diabetic patients and the elderly – in extreme cases they can even lead to amputation. Using electric stimulation, researchers in a project at Chalmers University of Technology, Sweden, and the University of Freiburg, Germany, have developed a method that speeds up the healing process, making wounds heal three times faster."

Source: CISION (18 April 2023)

HEALTHCARE

Novel, Highly Sensitive Biosensor Set to Transform Wearable Health Monitoring

"Wearable wireless biosensors are an integral part of digital healthcare and monitoring. Commonly used chipless resonant antenna-based biosensors are simple and affordable but have limited applicability due to their low sensitivity. Now, researchers from Japan have developed a novel, wireless, parity–time symmetry-based bioresonator that can detect minute concentrations of tear glucose and blood lactate. This sensitive, tuneable, and robust bioresonator has the potential to revolutionise personalised health monitoring and digitised healthcare systems."

Source: WASEDA (17 April 2023)

MATERIALS

The Quest to Build Wildfire-Resistant Homes

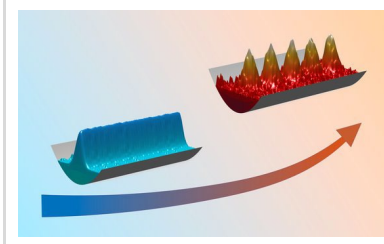
"Three engineers at the University of Massachusetts Amherst have invented a fabric that concludes the 80-year quest to make a synthetic textile modelled on polar bear fur. The results, published recently in the journal ACS Applied Materials and Interfaces, are already being developed into commercially available products.

Polar bears live in some of the harshest conditions on earth, shrugging off Arctic temperatures as low as -50 Fahrenheit. While the bears have many adaptations that allow them to thrive when the temperature plummets, since the 1940s scientists have focused on one in particular: their fur. How, the scientific community has asked, does a polar bear's fur keep them warm?"

Source: MIT Technology Review (21 April 2023)

MATERIALS

Quantum Liquid Becomes Solid When Heated

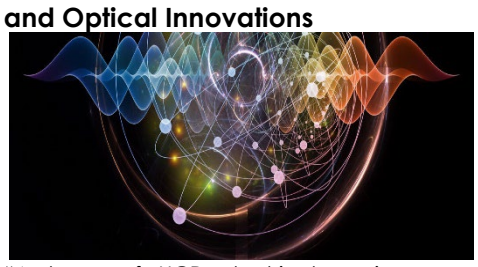


"Solids can be melted by heating, but in the quantum world it can also be the other way around: In a joint effort, an experimental team led by Francesca Ferlaino in Innsbruck, Austria, and a theoretical team led by Thomas Pohl in Aarhus, Denmark, show in Nature Communications how a quantum liquid forms super solid structures by heating. The scientists obtained a first phase diagram for a super solid at finite temperature."

Source: UIBK (18 April 2023)

MATERIALS

UCR Team Creates "Quantum Composites" For Various Electrical and Optical Innovations



"A team of UCR electrical engineers and material scientists demonstrated a research breakthrough that may result in wide-ranging advancements in electrical, optical, and computer technologies.

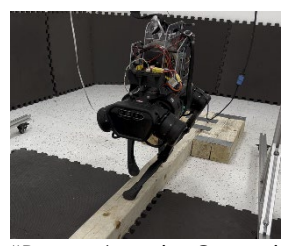
The Marlan and Rosemary Bourns College of Engineering research group, led by distinguished professor Alexander Balandin, has shown in the laboratory the unique and practical function of newly created materials, which they called quantum composites.

These composites consist of small crystals of called "charge density wave quantum materials" incorporated within a polymer (large molecules with repeating structures) matrix. Upon heating or light exposure, charge density wave material undergoes a phase transition that leads to an unusual electrical response of the composites."

Source: UCR (18 April 2023)

ROBOTICS

CMU Team Designs Four-Legged Robotic System That Can Walk a Balance Beam



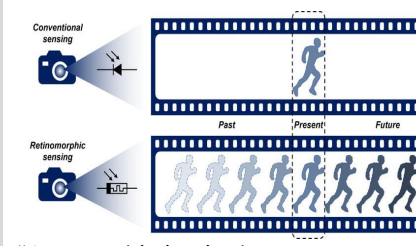
"Researchers in Carnegie Mellon University's Robotics Institute (RI) have designed a system that makes an off-the-shelf quadruped robot nimble enough to walk a narrow balance beam — a feat that is the first of its kind.

By leveraging hardware often used to control satellites in space, Manchester and his team offset existing constraints in the quadruped's design to improve its balancing capabilities..."

Source: CS (11 April 2023)

SENSORS

A Neuromorphic Visual Sensor Can Recognise Moving Objects and Predict Their Path

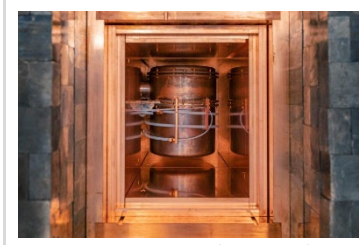


"A new bio-inspired sensor can recognise moving objects in a single frame from a video and successfully predict where they will move to. This smart sensor, described in a Nature Communications paper, will be a valuable tool in a range of fields, including dynamic vision sensing, automatic inspection, industrial process control, robotic guidance, and autonomous driving technology."

Source: Aalto (17 April 2023)

SUPERCONDUCTIVITY

Palladium Oxides Might Be Superb Superconductors



"Copper-based (cuprate) superconductors have long held the record for the highest superconducting critical temperature (Tc) at ambient pressure. In 2019, after decades of theoretical and experimental effort, researchers reported a nickel-based (nickelate) analogue to cuprate superconductors (see Trend: Entering the Nickel Age of Superconductivity). Since then, others have sought to pinpoint the factors that control superconductivity in such single-orbital-dominated systems. Motoharu Kitatani of the University of Hyogo in Japan and his colleagues now identify some of these factors and suggest that swapping out nickel for palladium could deliver a material that superconducts at even higher temperatures than cuprate superconductors [1]. The study could help guide the ongoing search for novel superconducting materials and establish "palladates" as the new kid on the block."

Source: APS (20 April 2023)

To view past Weekly Alerts CLICK HERE
For more articles or in-depth research, contact us at library@sutd.edu.sg