SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

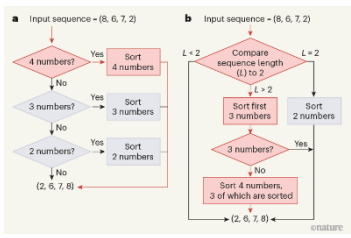
Weekly Discovery

We SHARE to inspire and ignite ideas!

12 Jun – 16 Jun 2023

AI

AI Learns to Write Sorting Software on Its Own

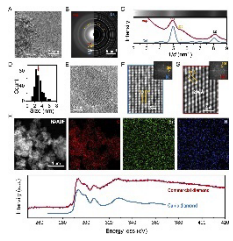


"Deep reinforcement learning has been used to improve computer code by treating the task as a game — with no special knowledge needed on the part of the player. The result has already worked its way into countless programs."

Source: Nature (7 Jun 2023)

CHEMISTRY

Unveiling The Complexity of Nanodiamond Structures



"Uncovering the structural complexity of nanodiamonds has been a significant experimental and theoretical challenge. We show that cubic nanodiamonds of small sizes (e.g., <5 nm) display the characteristic (200) forbidden reflections in their electron diffraction patterns, which makes them indistinguishable from new diamond (n-diamond). "

Source: PNAS (30 May 2023)

COMPUTING & AI

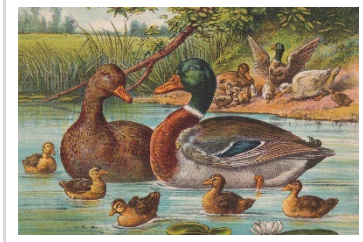
New Superconducting Diode Could Improve Performance of Quantum Computers and Artificial Intelligence

A team has developed a more energy-efficient, tuneable superconducting diode -- a promising component for future electronic devices -- that could help scale up quantum computers for industry and improve artificial intelligence systems. Read more here.

Source: University of Minnesota (6 Jun 2023)

EDUCATION & HISTORY

Nature Fakers and Real Naturalists



"Recently sold by a private dealer, a letter from President Theodore Roosevelt to naturalist John Burroughs spotlights the "nature faker" controversy that stirred up Americans in the first decade of the twentieth century. Roosevelt, renowned as the conservation President, was personally involved in the debate—a debate still echoes today in questions of scientific objectivity and the nature, and rights, of animals. "

Source: JSTOR (9 Jun 2023)

ARCHITECTURE

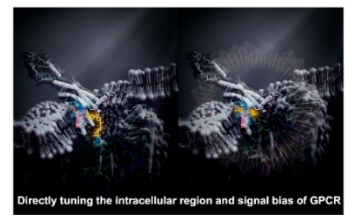
Between Passion and Possession: Women Architects and The Houses They Built for Family, Love and Work

"This article discusses a specific architectural type: single-family homes designed by and for heterosexual couples who were both architects and collaborators, and who dedicated a particular space in their home to architectural work. My examples are a handful of modest houses built in the suburbs of Copenhagen with state-supported mortgages during the post-war period by Inger and Johannes Exner, Karen and Ebbe Clemmensen, and Rut Speyer and Eigil Hartvig Rasmussen."

Source: Taylor&Francis (6 Jun 2023)

HEALTH & MEDICINE

A New Way to Develop Drugs Without Side Effects



Have you ever wondered how drugs reach their targets and achieve their function within our bodies? If a drug molecule or a ligand is a message, an inbox is typically a receptor in the cell membrane. One such receptor involved in relaying molecular signals is a G protein-coupled receptor (GPCR). About one-third of existing drugs work by controlling the activation of this protein. Researchers now reveal a new way of activating GPCR by triggering shape changes in the intracellular region of the receptor. This new process can help researchers design drugs with fewer or no side effects. Read the paper in Nature.

Source: The University of Tokyo (8 Jun 2023)

HEALTHCARE

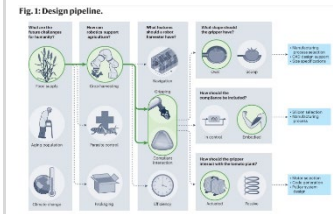
Microplastics Stick Around in Human Airways

Inhaled microplastics can pose serious health risks, so understanding how they travel in the respiratory system is essential for prevention and treatment of respiratory diseases. Researchers develop a computational fluid dynamics model to analyse microplastic transport and deposition in the upper airway. The team explored the movement of microplastics with different shapes and sizes and under slow and fast breathing conditions. Microplastics tended to collect in hot spots in the nasal cavity and oropharynx, or back of the throat.

Source: AIP Publishing (13 June 2023)

LARGE LANGUAGE MODELS

ChatGPT Designs Its First Robot with TU Delft Researchers

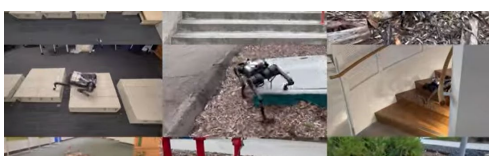


Poems, essays and even books -- is there anything the OpenAI platform ChatGPT can't handle? These new AI developments have inspired researchers to dig a little deeper: For instance, can ChatGPT also design a robot? And is this a good thing for the design process, or are there risks? Read more in their article here.

Source: Delft University of Technology (7 Jun 2023)

ROBOTICS

Four-Legged Robot Traverses Tricky Terrains Thanks to Improved 3D Vision



Researchers have developed a new model that trains four-legged robots to see more clearly in 3D. The advance enabled a robot to autonomously cross challenging terrain with ease -- including stairs, rocky ground, and gap-filled paths -- while clearing obstacles in its way.

Source: UC San Diego (13 Jun 2023)

ROBOTICS

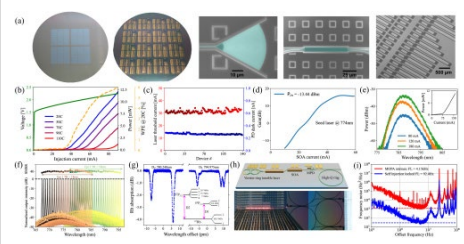
Taiwan Deploys Robotic Vehicles to Help Tackle Mosquito Problem

"In an effort to slow down the spread of the dengue disease, researchers at Kaohsiung city, Taiwan, have used robotic vehicles to identify and eliminate the breeding sources of Aedes mosquitoes - with great results."

Source: E&T (9 Jun 2023)

SENSORS

Photonic Integration Platform for Rubidium Sensors and Beyond



"We have advanced the heterogeneous silicon nitride photonic platform, enabling operation at the 780 nm wavelength range for rubidium sensors and other applications while remaining operable at high temperatures up to 110◦C.

This platform surpasses other existing technologies with the superior integration of a comprehensive set of active building-block devices to enable fully integrated high-performance systems-on-a-chip. "

Source: Optica (9 Jun 2023)

VR TECHNOLOGY

Cityu Invents Wireless Olfactory Feedback System to Let Users Smell in The VR World

A research team recently invented a novel, wireless, skin-interfaced olfactory feedback system that can release various odours with miniaturized odour generators (OGs). The new technology integrates odours into virtual reality (VR)/augmented reality (AR) to provide a more immersive experience, with broad applications ranging from 4D movie watching and medical treatment to online teaching.

Source: ScienceDaily (6 Jun 2023)

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