SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Weekly Discovery

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2 – 6 May 2022

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HealthCare	Robotics & Automation	Design & Innovation
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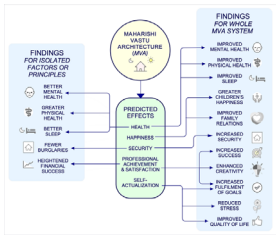
ARCHITECTURE

Breakthrough In How Buildings Can Promote Health And Well-Being

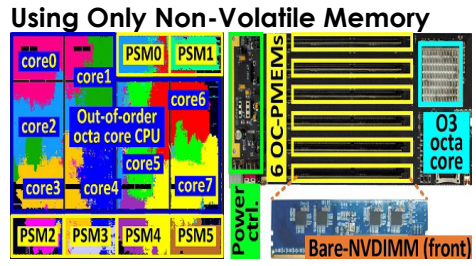


"MVA is a holistic wellness architectural system that aligns buildings with nature's intelligence, creating balanced, orderly, and integrated living environments with the goal of improving occupants' lives in several areas."

Source: Eurekalert! (29 April 2022)

COMPUTING

LightPC Presents a Resilient System Using Only Non-Volatile Memory



"A research team has developed hardware and software technology that ensures both data and execution persistence. The Lightweight Persistence Centric System (LightPC) makes the systems resilient against power failures by utilizing only non-volatile memory as the main memory."

Source: KAIST (25 April 2022)

CONSTRUCTION

Disposable Masks Could Be Used To Make More Durable Concrete

"With the pervasive single-use masks during the pandemic now presenting an environmental problem, researchers have demonstrated the idea of incorporating old masks into a cement mixture to create stronger, more durable concrete."

Source: Washington State University (27 April 2022)

MATERIALS

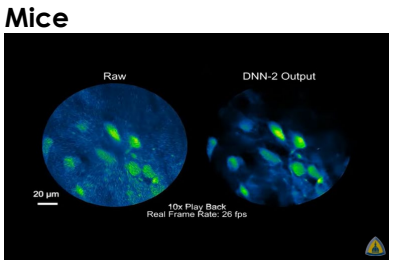
Wood Made From Kombucha?

"Through independent research, I realized that bacterial cellulose is highly similar to the cellulose that comprises about 50% of tree-based wood." To develop the product, this cellulose is poured into a mold together with agar, an algae-based gel that acts as a binder. They dehydrate the material and then place the hardened pulp sheet under a mechanical press to flatten it. What remains is a sheet that can be sanded and cut like wood from a tree, and which is also biodegradable."

Source: archdaily (3 May 2022)

MEDTECH

From Blurry To Bright: AI Tech Helps Researchers Peer Into The Brains Of Mice

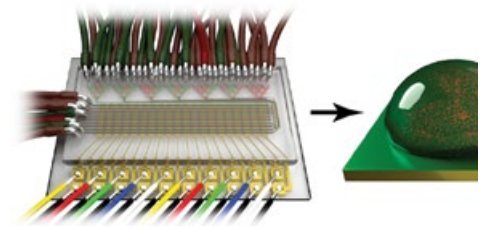


"Johns Hopkins biomedical engineers have developed an artificial intelligence (AI) training strategy to capture images of mouse brain cells in action. The researchers say the AI system, in concert with specialized ultra-small microscopes, make it possible to find precisely where and when cells are activated during movement, learning and memory. The data gathered with this technology could someday allow scientists to understand how the brain functions and is affected by disease."

Source: John Hopkins (28 April 2022)

MEDTECH

Researchers Develop Smartphone-Powered Microchip For At-Home Medical Diagnostic Testing

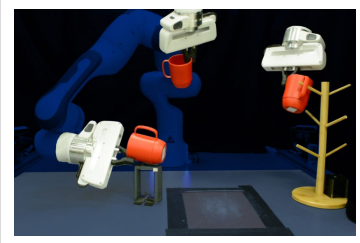


"A University of Minnesota Twin Cities research team has developed a new microfluidic chip for diagnosing diseases that uses a minimal number of components and can be powered wirelessly by a smartphone. The innovation opens the door for faster and more affordable at-home medical testing."

Source: UNIVERSITY OF MINNESOTA (2 May 2022)

ROBOTS

An Easier Way To Teach Robots New Skills

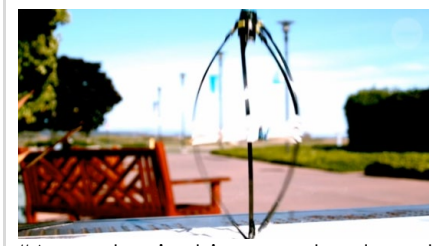


"MIT researchers have developed a system that enables a robot to learn a new pick-and-place task based on only a handful of human examples. This could allow a human to reprogram a robot to grasp never-before-seen objects, presented in random poses, in about 15 minutes."

Source: MIT (25 April 2022)

ROBOTICS

Hitting New Heights

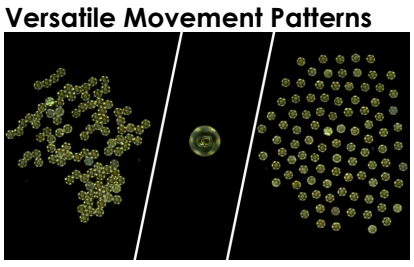


"A mechanical jumper developed by UC Santa Barbara engineering professor Elliot Hawkes and collaborators is capable of achieving the tallest height — roughly 100 feet (30 meters) — of any jumper to date, engineered or biological. The feat represents a fresh approach to the design of jumping devices and advances the understanding of jumping as a form of locomotion."

Source: UC Santa Barbara (27 April 2022)

ROBOTICS

Microrobot Collectives Display Versatile Movement Patterns



"Collective behavior and swarm patterns are found everywhere in nature. Robots can also be programmed to act in swarms. Researchers have developed collectives of microrobots, which they can move in every formation they wish."

Source: Max Planck Institute (26 April 2022)

SENSORS

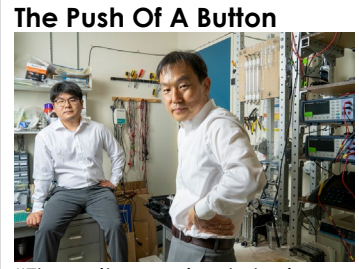
A Quantum of Sensing—Atomic Scale Bolsters New Sensor Boom

"Imagine sensors that can detect the magnetic fields of thoughts, help lunar rovers detect oxygen in moon rocks, or listen to radio waves from dark matter. Just as quantum computers can theoretically find the answers to problems no classical computer could ever solve, so too can an emerging generation of quantum sensors lead to new levels of sensitivity, new kinds of applications, and new opportunities to advance a range of fields, technologies, and scientific pursuits."

Source:IEEE Spectrum (29 April 2022)

WATER

From Seawater To Drinking Water, With The Push Of A Button

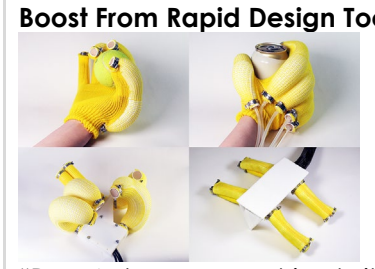


"The suitcase-sized device, which requires less power to operate than a cell phone charger, can also be driven by a small, portable solar panel, which can be purchased online for around $50. It automatically generates drinking water that exceeds World Health Organization quality standards. The technology is packaged into a user-friendly device that runs with the push of one button."

Source: MIT News (27 April 2022)

WEARABLES

Soft Assistive Robotic Wearables Get A Boost From Rapid Design Tool



"PneuAct uses a machine knitting process — not dissimilar to your grandma's plastic needle knitting — but this machine operates autonomously. A human designer simply specifies the stitch and sensor design patterns in software to program how the actuator will move, and it can then be simulated before printing. The textile piece is fabricated by the knitting machine, which can be fixed to an inexpensive, off-the-shelf rubber silicone tube to complete the actuator."

Source: MIT News (3 May 2022)

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