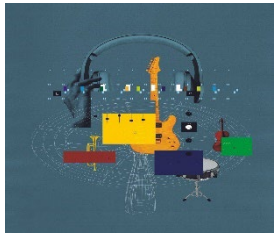# Weekly Discovery

We SHARE to inspire and ignite ideas!

10 – 14 October 2022

AI

DEEP LEARNING COULD BRING THE CONCERT EXPERIENCE HOME

"Our system, which we call 3D Soundstage, permits music playback in soundstage on smartphones, ordinary or smart speakers, headphones, earphones, laptops, TVs, soundbars, and in vehicles. Not only can it convert mono and stereo recordings to soundstage, it also allows a listener with no special training to reconfigure a sound field according to their own preference, using a graphical user interface. For example, a listener can assign the locations of each instrument and vocal sound source and adjust the volume of each—changing the relative volume of, say, vocals in comparison with the instrumental accompaniment. The system does this by leveraging artificial intelligence (AI), virtual reality, and digital signal processing (more on that shortly)."

Source: IEEE Spectrum (10 September 2022)

ARCHITECTURE

Henley Halebrown completes "hybrid building" in Hackney with red concrete loggia

"London studio Henley Halebrown has used a palette of reddish-brown concrete and bricks to visually tie together a school and housing in this mixed-use scheme in Hackney, which is one of six projects shortlisted for this year's RIBA Stirling Prize…Described by Henley Halebrown as a "hybrid building", the 11-storey tower and three-storey school are unified by an earthy-red colour palette that also gives them a distinct urban character."

Source: Dezeen (8 October 2022)

ARCHITECTURE

The Natural Pavilion / DP6 architectuurstudio

"The Natural Pavilion is an almost 100% biobased, circular, and fully demountable inspiration pavilion that can be rebuilt in a different configuration at a different location. The Dutch National Government's Pavilion was designed and built within a year for the Floriade Expo 2022, and focuses on the spatial challenges currently facing the Netherlands: the energy and raw materials transition, solving the housing shortage, making agriculture more sustainable, restoring biodiversity, and adaptation to climate change. The Natural Pavilion serves as a showcase for innovative bio-based construction and contributes to the increased application and scaling-up of bio-based solutions."

Source: archdaily (10 October 2022)

AGING

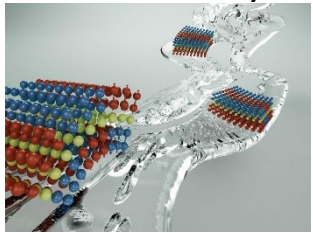## The Costs of Caring for a Graying Population

"Researchers from the University of Tsukuba uncover intriguing differences in spending on long-term care between Japan's municipalities

Tsukuba, Japan—With the "graying population" phenomenon becoming widespread, many countries are facing the challenge of caring for their elderly population. In Japan, the country with the oldest population, a universal long-term care (LTC) insurance system was established in 2000 to help meet this need. Now, researchers from the University of Tsukuba have revealed the considerable variation between Japan's municipalities in spending on LTC.."

Source: TSUKUBA (30 September 2022)

COMPUTING

Ultrafast Racetrack Memory Enters the Third Dimension Arrays of arching nanowires could lead to ultrafast, ultrahigh-density solid-state nonvolatile memory

"Racetrack memory potentially "has unrivaled density compared to other memory technologies," says Stuart Parkin, director of the Max Planck Institute of Microstructure Physics in Halle, Germany, and who developed the concept while at IBM. Racetrack memory is solid-state like flash memory, lacking unwieldy moving parts, and is nonvolatile, storing data even after the power is removed."

Source: IEEE Spectrum (9 October 2022)

ENERGY

Why some countries are leading the shift to green energy

"A new study appearing today in the journal Science identifies the political factors that allow some countries to take the lead in adopting cleaner sources of energy while others lag behind. The findings offer important lessons as many governments around the world race to reduce greenhouse gas emissions and limit the devastating impacts of climate change."

Source: BERKELEY (6 October 2022)

ENERGY

Seaweed-based battery powers confidence in sustainable energy storage

"Bristol-led team uses nanomaterials made from seaweed to create a strong battery separator, paving the way for greener and more efficient energy storage."
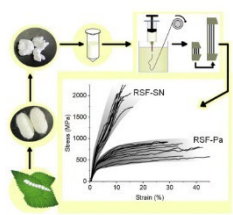
Source: BRISTOL (5 October 2022)

LEARNING

On-site reactors could affordably turn CO2 into valuable chemicals

"New technology developed at the University of Waterloo could make a significant difference in the fight against climate change by affordably converting harmful carbon dioxide (CO2) into fuels and other valuable chemicals on an industrial scale."

Source: UWATERLOO (6 October 2022)

MATERIALS

Artificial superstrong silkworm silk surpasses natural spider silks

"This study reports a simple and scalable method to produce superstrong silk fibers using regenerated proteins from commercialized silkworm silk. This artificial silkworm silk exhibits a tensile strength of ~2.0 GPa, significantly higher than the strongest natural silk, spider dragline silk. It is also considerably stiffer than any known natural silks. The deliverable from this study reverses the previous perception that silkworm silk cannot compete with spider silks on mechanical performance and thus opens a promising way to produce profitable high-performance artificial silks."

Source: Science Direct (28 September 2022)

PATENTS

Don't let standards slip: How to prioritize your efforts when everything is essential

"As standard essential patents (SEPs) continue to accelerate and impact new industries beyond just telecommunications, it's become increasingly challenging for stakeholders to wade through data sets, navigate data weaknesses and assess what's truly essential in order to make the best commercial and licensing decisions.

To help you navigate the complexities of SEPs, we've released a new standards essential patents paper."

Source: Clarivate (September 2022)

RESEARCH

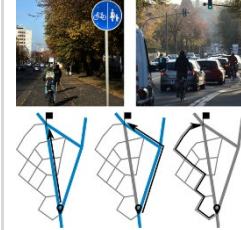## Breaking the Glass Ceiling in Science by Looking at Citations

"USC's Information Sciences Institute researchers used artificial intelligence to study gender disparities in science.

USC's Information Sciences Institute (ISI) Principal Scientist Kristina Lerman and her team used AI to look for answers to this question. The resulting paper has been published in the prestigious, peer-reviewed, multi-disciplinary science journal Proceedings of the National Academy of Sciences (PNAS) on September 26, 2022."

Source: USC (26 September 2022)

TRANSPORT

GOOD PLANNING GETS THE BIKE ROLLING

"Turning it downside up: Novel, network-dynamic planning approach for urban bike path infrastructure enables demand-driven design of cycling networks by reversing the usual approach. The new concept could improve the bike-friendliness of cities - and thus their sustainability and climate footprint."

Source: TU Dresden (6 October 2022)