SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Weekly Discovery

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29 June – 3 July 2020

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HealthCare	Robotics & Automation	Design & Innovation
Cybersecurity	Digital Design & Fabrication	Advanced Manufacturing

3D PRINTING

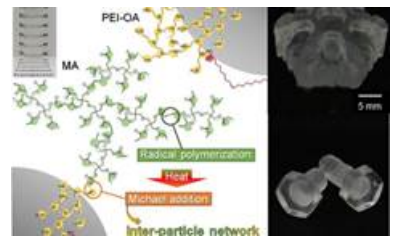
'fast complexity' project employs 3D printing to make concrete use more efficient

"although optimization algorithms can significantly reduce the amount of concrete used on complex buildings, the construction industry remains limited by the available fabrication technologies. to tackle this problem, digital building technologies, ETH zürich has proposed an automated solution that combines the fabrication speed of concrete 3D printing with the geometric precision of reusable 3D printed formwork."

Source: DesignBoom (28 June 2020)

3D PRINTING

Researchers sharply reduce time needed for glass and ceramic 3-D printing

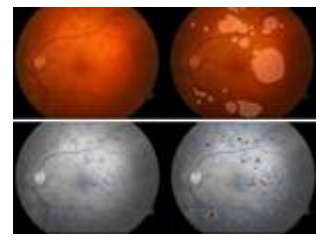


"The fabrication of complex ceramic or glass structures via stereolithography, a type of 3-D printing, has long been held back by the length of time at the back end of the process, which can be up to two days. A new technique now reduces this time down to less than five hours."

Source: Phys.Org (25 June 2020)

AI

AI for Comprehensive Annotation of Retinal Lesions



"The algorithm's iterative approach identifies greater lesions than non-iterative approaches, and boosts specificity by approximately 10%, with diagnostic accuracy of about 80%. The algorithm annotates images to depict which lesions it finds concerning, helping guide physician decision-making." Full Paper

Source: Medgadget (29 Jun 2020)

AUTONOMOUS VEHICLES

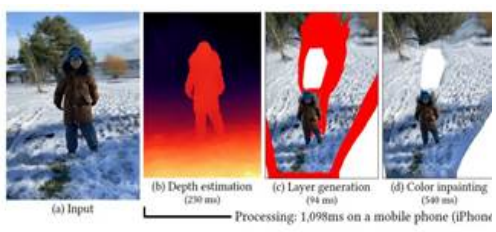
Q&A: The Masterminds Behind Toyota's Self-Driving Cars Say AI Still Has a Way to Go

"There are three different systems that you need in a self-driving car… The one that by far is the most problematic is prediction. It's not prediction of other automated cars, because if all cars were automated, this problem would be much more simple. How do you predict what a human being is going to do? That's difficult for deep learning to learn right now.."

Source: IEEE Spectrum(Jun 29 2020)

COMPUTING

Smile! Photos converted into 3D from any mobile device

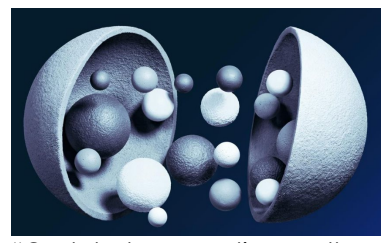


"In this new work from Facebook researchers, users are now able to turn the photos they take on their devices into 3D images within seconds. the Facebook team has added an algorithm that automates depth estimation from the 2D input image, and the technique can be utilized directly on any mobile device, expanding the method beyond just the Facebook app and without the requirement of having a dual-lens camera."

Source: Eurekalert! (25 June 2020)

COVID19 & INDUSTRY

COVID-19: Implications for business



"Our latest perspectives on the coronavirus outbreak, the twin threats to lives and livelihoods, and how organizations can prepare for the next normal."

Source: Frost & Sullivan(Jun 25 2020)

ENGINEERING

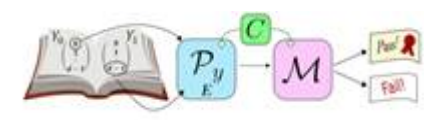
Engineers use "DNA Origami" to Identify Vaccine Design Rules

"By folding DNA into a virus-like structure, MIT researchers have designed HIV-like particles that provoke a strong immune response from human immune cells grown in a lab dish.."

Source: MIT News (29 Jun 2020)

HEALTHCARE ARCHITECTURE

Quantum physics provides a way to hide ignorance

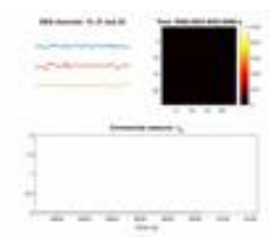


"Students can hide their ignorance and answer questions correctly in an exam without their lack of knowledge being detected by teachers -- but only in the quantum world. Read more in Physical Review Letters."

Source: Science Daily (29 June 2020)

HEALTH INFORMATICS

Artificial intelligence identifies, locates seizures in real-time

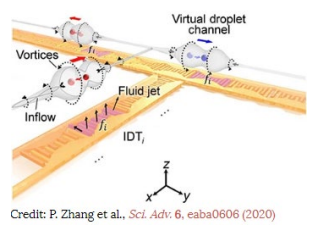


"Researchers from Washington University in St. Louis' McKelvey School of Engineering have combined artificial intelligence with systems theory to develop a more efficient way to detect and accurately identify an epileptic seizure in real-time. Read more in Scientific Reports."

Source: Medical Xpress (29 June 2020)

HEALTH TECH

Microfluidic drops leave no trace



"The acoustofluidic process keeps the droplets contact-free above the substrate. With that advantage, the researchers guide one droplet after another along the same path without contamination."

Source: Physics Today(26 June 2020)

INNOVATION

Badger Technologies Introduces PatrolBot Autonomous Robot for Security Guard Industry

"The PatrolBot autonomous robot extends security workforce operations by automatically verifying that windows and doors are secured, fire extinguishers and defibrillators are properly stored, and floors are free of debris and potential hazards. The robot also can investigate alarms and areas not supported by surveillance cameras."

Source: Business Wire (29 June 2020)

MATERIALS

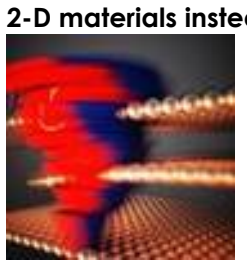
Chemistry Paves the Way for Improved Electronic Materials

"Indium nitride is a promising material for use in electronics, but difficult to manufacture. Scientists at Linköping University, Sweden, have developed a new molecule that can be used to create high-quality indium nitride, making it possible to use it in, for example, high-frequency electronics. The results have been published in Chemistry of Materials."

Source: EurekAlert! (26 Jun 2020)

NANOPHYSICS

Team shows how to store data using 2-D materials instead of silicon chips



"A Stanford-led team has invented a way to store data by sliding atomically thin layers of metal over one another, an approach that could pack more data into less space than silicon chips, while also using less energy. Read more in Nature."

Source: Phys.Org(29 June 2020)

ROBOTICS

Drone With Bubble Machine Can Pollinate Flowers Like a Bee

"Pollen-carrying soap bubbles could provide a simple and effective method of artificial pollination"

Source: IEEE Spectrum (24 Jun 2020)

ROBOTS

Corkscrew Design Helps Drug Delivery Robots Stick To Cancer Cells

"The microrobot is layered with nickel and titanium oxide to ensure it can be magnetically manipulated and be biocompatible with the human body. Drugs can be loaded onto the porous, corkscrew-shaped scaffold and inside the needle."

Source: Asian Scientist(24 June 2020)

WEARABLES

Wearable-tech glove translates sign language into speech in real time

"The system includes a pair of gloves with thin, stretchable sensors that run the length of each of the five fingers. These sensors, made from electrically conducting yarns, pick up hand motions and finger placements that stand for individual letters, numbers, words and phrases. "

Source: UCLA (29 June 2020)

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