SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

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6 JANUARY 2020 - 10 JANUARY 2020

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HealthCare	Robotics & Automation	Design & Innovation
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ARCHITECTURE

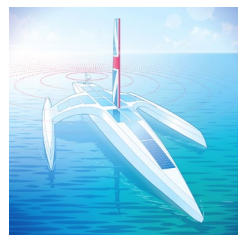
Perkins and Will Proposes Compact Sleeping Units for L.A.'s Homeless

"In response to the mayor's A Bridge Home initiative, the firm's Innovation Incubator team designed the prefabricated Dome unit in an effort to offer a higher level of dignity and sophistication than typically found in U.S. shelters."

Source: The Architect's Newspaper (3 January 2020)

AUTONOMOUS SHIP

Bon Voyage for the Autonomous Ship Mayflower

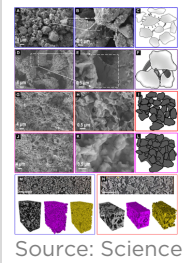


"The ship will cross the Atlantic to Plymouth, Mass., in 12 days instead of the 60 days of the 1620 voyage. It'll be made of aluminum and composite materials. And it will measure 15 meters and weigh 5 metric tons—half as long and 1/36 as heavy as the original wooden boat. Just as a spacefaring mission would, the new Mayflower will contain science bays for experiments to measure oceanographic, climate, and meteorological data."

Source: IEEE Spectrum (3 January 2020)

BATTERIES

Supercharging Tomorrow: World's Most Efficient Lithium-Sulfur Battery



Source: Science Advances

"Imagine having access to a battery, which has the potential to power your phone for five continuous days, or enable an electric vehicle to drive more than 1000km without needing to 'refuel'."
Read more at Science Advances.

Source: Science Daily (3 January 2020)

BATTERIES

The Battery Decade: How Energy Storage Could Revolutionize Industries in the Next 10 Years

"Over the last decade a surge in lithium-ion battery production has led to an 85% decline in prices, making electric vehicles and energy storage commercially viable for the first time in history."

Source: CNBC (30 December 2019)

CES 2020

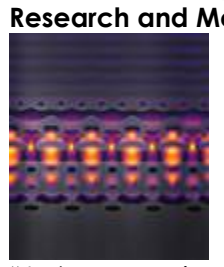
10 Tech Trends to Watch at CES 2020

"For the tech industry, the New Year always starts with a bang. CES, the annual consumer tech show in Las Vegas with its way-too-large TVs and cornucopia of gadgets from around the world, sets the tone for tech trends for the year."

Source: Forbes (5 January 2020)

ENGINEERING

Stanford Researchers Build a Particle Accelerator That Fits on a Chip, Miniaturizing a Technology That Can Now Find New Applications in Research and Medicine

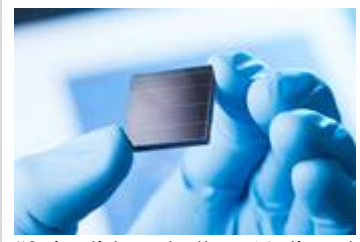


"Just as engineers once compressed some of the power of room-sized mainframes into desktop PCs, so too have Stanford researchers shown how to pack some of the punch delivered by today's ginormous particle accelerators onto a tiny silicon chip."

Source: Stanford (2 January 2020)

GREEN ENERGY

Technological Breakthrough Achieved for Solar Cells – Previously Thought Impossible

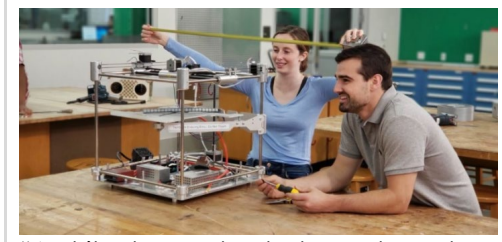


"Scientists at the National Renewable Energy Laboratory (NREL) achieved a technological breakthrough for solar cells previously thought impossible."

Source: SciTech Daily (5 January 2020)

LEARNING STYLE

Making It: Gen Z Learns by Doing



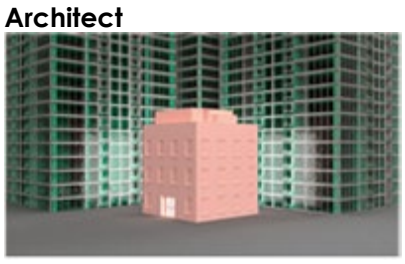
"Architecture schools have long been based around a few fundamental space planning priorities. These can inform other disciplines when planning for Generation Z:

- An Open Studio;
- Immediate Access to Technology;
- This Mess is a Place;
- Craft of Place."

Source: Building Design + Construction (6 January 2020)

LOW-CARBON ARCHITECTURE

I've Been Polluting the Planet for Years. I'm Not an Oil Exec—I'm an Architect

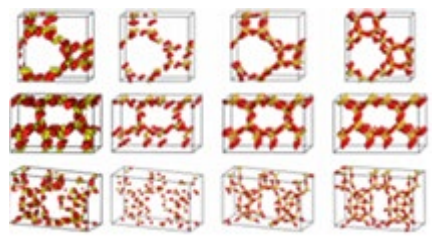


"The environmental impacts of the built environment are staggering. Although it's become mainstream to discuss energy efficiency and advocate for minimizing those impacts, architects, engineers, and planners have yet to truly reckon with the magnitude and consequences of everyday design decisions."

Source: Fast Company (3 January 2020)

MATERIALS SCIENCE

Inverse Design of Porous Materials Using Artificial Neural Networks



"Although progress has been made in creating small and simple molecules, complex materials such as crystalline porous materials have yet to be generated using any of the neural networks. Here, we have implemented a generative adversarial network that uses a training set of 31,713 known zeolites to produce 121 crystalline porous materials."

Source: Science Advances (3 January 2020)

MATHEMATICS

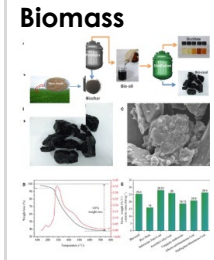
How Strong Is Your Knot?

"MIT mathematicians and engineers have developed a mathematical model that predicts how stable a knot is, based on several key properties, including the number of crossings involved and the direction in which the rope segments twist as the knot is pulled tight."

Source: MIT News (2 January 2020)

RENEWABLE ENERGY

Bio-Coal: A Renewable and Massively Producible Fuel from Lignocellulosic Biomass



"Life cycle assessment further shows that the bio-coal production process could achieve net positive energy, financial, and environmental benefits. By using available biomass wastes as feedstock, China is expected to have a total bio-coal production of 402 million tons of standard coal equivalent, which is equal to 13% of national coal consumption."

Source: Science Advances (3 January 2020)

ROBOTICS

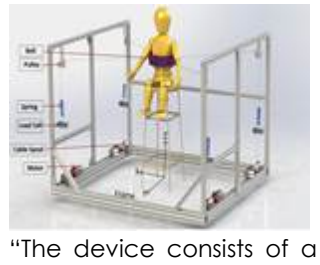
Robotic Architecture Inspired by Pelican Eel: Origami Unfolding and Skin Stretching Mechanisms

"Researchers at Seoul National University's Soft Robotics Research Center in South Korea and the Rebikoff-Niggeler Foundation (FRN) in Portugal have recently developed a robotic architecture structurally inspired by the pelican eel, a species of fish that lives in the deep sea."

Source: Tech Xplore (6 January 2020)

ROBOTICS

Robotic Trunk Support Device for Rehabilitation Post Spinal Cord Injury

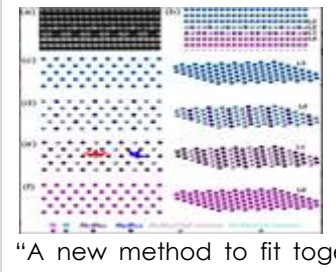


"The device consists of a motorized belt that attaches to the torso, and which applies forces as users complete upper body movements. The device is intended to reduce falls and improve movement capabilities in patients with spinal cord injuries, who are typically wheelchair users."

Source: Medgadget (6 January 2020)

SEMICONDUCTORS

New Method Gives Robust Transistors



"A new method to fit together layers of semiconductors as thin as a few nanometres has resulted in not only a scientific discovery but also a new type of transistor for high-power electronic devices. The result, published in Applied Physics Letters, has aroused huge interest."

Source: Science Daily (7 January 2020)

TRANSPORTATION

CES 2020 Expectations – Roadmap for the Upcoming Decade Centers on How Vehicles Will Operate and Interact with Their Surroundings

"This upcoming decade will decide how mobility will be perceived and how it will play an important role in the lives of people without seeming, as it often has in the past, like a scene from a science fiction movie. This decade will provide answers to all the investments that have gone into making mobility a seamless option, involving key elements from the Connected, Autonomous, Shared and Electrified spheres."

Source: Frost & Sullivan (3 January 2020)