

Weekly Discovery

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7 January 2019 - 11 January 2019

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Artificial Intelligence & Data Science	Aviation	Cities
HealthCare	Robotics & Automation	Design & Innovation
Cybersecurity	Digital Design & Fabrication	Advanced Manufacturing

AEROSPACE
Almost Time to Fly: A Look at the Boeing 777X Engine

"The GE9X engine generates 105,000 pounds of thrust, while in 2002 a GE90-115B jet engine produced as much as 127,900 pounds of thrust setting the world record. Nonetheless, due to its aerodynamic efficiency and its larger 118-foot wing, the 777X will require less thrust than the GE90 powered Boeing 777."

Source: [Simple Flying](#) (8 January 2019)

ARCHITECTURE
Façade Form-Finding with Swarm Intelligence

"In this study, 'swarm intelligence', was investigated for possible use in architectural design and for façade construction; the notion of a conceptual design method has been introduced via multi-agent-based swarm intelligence algorithms."

Source: [Automation in Construction](#) (March 2019)

ARTIFICIAL INTELLIGENCE
AI Predicts Cancer Patients' Symptoms

"Doctors could get a head start treating cancer thanks to new AI that is able to predict symptoms and their severity throughout the course of a patient's treatment."

Source: [Science Daily](#) (2 January 2019)

AVIATION
What's Ahead for Airlines and Aviation in 2019

"Forbes' expert aviation contributors see change in the air next year. From airline M&A to advances in technologies that will change the passenger experience to a slowdown in the torrent of outbound Chinese travel, here are their predictions for 2019."

Source: [Forbes](#) (26 December 2018)

COMPUTER AIDED DESIGN
Customizing Computer-Aided Design

"MIT researchers have devised a technique that 'reverse engineers' complex 3-D computer-aided design (CAD) models, making them far easier for users to customize for manufacturing and 3-D printing applications."

Source: [MIT News](#) (2 January 2019)

CYBERSECURITY
Envisioning the Next Generation Cybersecurity Practices

"In brief, this research service covers the following points:

- 1) Cybersecurity & Enterprises – An overview
- 2) Drivers and challenges for Adoption of Best Practices in Cybersecurity
- 3) Technologies Impacting the Future of Cybersecurity
- 4) Considerations for Management Decision Making."

Source: [Frost & Sullivan](#) (December 2018)

FAÇADE
Check Out 2018's Best Façade Products for Enclosure Performance and Design

"To ring in the New Year, AN dived into a year's worth of facade products to select the best of 2018. Ranging from operable vent windows to manually-embossed cement rainscreen panels, these products are sure to boost the environmental performance and aesthetic value of any new project."

Source: [The Architect's Newspaper](#) (3 January 2019)

GADGETS
CES 2019: Tech Preview of the Expo's Hottest New Gadgets

"The CES trade show is powering up again in Vegas. Most of the biggest names in tech and stacks of start-ups you've never heard of will compete for attention over the next week."

Source: [BBC News](#) (5 January 2019)

MEDICAL DEVICE
Implantable Knee Shock Absorber Embedded in First Patient in U.S.

"The device attaches to the sides of the femur and tibia bones, away from the joint itself and therefore doesn't alter the anatomy of the fragile joint."

Source: [Medgadget](#) (8 January 2019)

NANOTECHNOLOGY
New Technology Could Be the Future of Brain-Computer Interfaces

"A new technology developed in Barcelona overcomes this technical limitation, unlocking the wealth of information found below 0.1 Hz and paving the way for future brain-computer interfaces."

Source: [R&D Magazine](#) (3 January 2019)

NEURAL ENGINEERING
Phantom Limb Movement Controls a Robotic Arm

"A team from the CNRS and Aix-Marseille University, in collaboration with the Regional Institute of Readaptation Nancy in France, conducted a study in which two transhumeral amputees tested a complex robotic prosthesis with a control system able to decode phantom limb signals in real time to complete simple real-life activities."

Source: [Physics World](#) (2 January 2019)

NEW MATERIALS
Biologically Inspired, Cell-Selective Release of Aptamer-Trapped Growth Factors by Traction Forces

"... a bioinspired, programmable nanotechnology - based platform is described that harnesses cellular traction forces to activate growth factors, eliminating the need for exogenous triggers (e.g., light), spatially diffuse triggers (e.g., enzymes, pH changes), or passive activation (e.g., hydrolysis)."

Source: [Advanced Materials](#) (7 January 2019)

PHOTONICS
Programming Light on a Chip

"SEAS researchers developed a technique to fabricate high-performance optical microstructures using lithium niobate, a material with powerful electro-optic properties."

Source: [Harvard John A. Paulson School of Engineering and Applied Sciences](#) (7 January 2019)

QUANTUM COMPUTING
Quantum Scientists Demonstrate World-First 3D Atomic-Scale Quantum Chip Architecture

"Researchers have shown for the first time that they can build atomic precision qubits in a 3D device. It is another major step towards a universal quantum computer."

Source: [EurekAlert!](#) (7 January 2019)

QUANTUM PHYSICS
Electric Nanoparticles Can Target and Kill Cancer Cells by Zapping Them

"Particles that produce electrical signals when bombarded with ultrasound could be a way to direct a cell-killing treatment directly to tumors."

Source: [MIT Technology Review](#) (7 January 2019)

ROBOTICS
At CES 2019, Trifo Aims to Shake Up Robot Vacuum Market with AI

"... users can monitor their homes remotely by utilizing the robot's cameras instead of installing in-home, static surveillance cameras."

Source: [Robotics Business Review](#) (7 January 2019)