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Researcher Exploits Power Supply to Transmit, Steal Data from PC

PC Magazine

Michael Kan

December 12, 2022

Mordechai Guri at Israel's Ben-Gurion University of the Negev transmitted stolen data from a personal computer by manipulating the device's power supply. "By regulating the workload of the CPU [central processing unit], it is possible to govern its power consumption and hence control the momentary switching frequency of the SMPS (switch-mode power supplies)," Guri explained. "The electromagnetic radiation generated by this intentional process can be received from a distance using appropriate antennas." Guri said malware installed on a universal serial bus drive could infect the target PC, but suggested banning smartphone use around the computer as a countermeasure.

Full Article

Big Tech, Community Colleges Partner on Education

Voice of America News

Andrew Smith

December 10, 2022

Community colleges and big technology companies are partnering on programs to educate students in artificial intelligence (AI), data science, user experience design, and other fields. Dell Technologies, Intel, Google, and Amazon are among the companies that have established training programs for community college students. Intel has partnered with 74 community colleges in 32 states on its AI for Workforce Program, with plans for partnerships in all 50 states by the end of next year. Meanwhile, Dell and Intel have joined forces on the Artificial Intelligence Incubator Network, which has awarded 10 community colleges with $40,000 grants to put toward the construction of AI laboratories. The network also supports virtual AI training and aims to help improve AI education through monthly meetings between the tech companies and community colleges.

Full Article

Computer Scientists Improve Python Sorting Function

University of Liverpool (U.K.)

December 12, 2022

Computer scientists at the U.K.'s University of Liverpool (UOL) have accelerated the Python programming language's sorting function through the Powersort implementation, which the Python community deployed in Python 3.11 in October. Powersort lists objects in ascending order according to the "list.sort" and "sorted" functions. UOL's

Sebastian Wild found the basis for Powersort when investigating the TimSort custom sorting algorithm, particularly its poorly understood merging policy and associated security bug. Wild and Ian Munro of Canada's University of Waterloo found a theoretical algorithm from the 1970s that addressed this flaw. The Python Software Foundation's Carl Friedrich Bolz-Tereick said, "Even though the improvement for many inputs is tiny, the sheer number of Python installations can lead to significant energy saving on a global scale."

Full Article

Robots Set Their Sights on New Job: Sewing Blue Jeans

Reuters

Timothy Aeppel
December 12, 2022

Siemens has been working with clothing companies like San Francisco startup Sewbo Inc., Levi Strauss & Co., and military uniform maker Bluewater Defense LLC on efforts to automate apparel manufacturing. Despite improvements in robotic technology, researchers say it could take years before robots can handle fabric, which is floppy and comes in an assortment of textures and thicknesses. Siemens, in partnership with the Advanced Robotics for Manufacturing Institute, has focused on Sewbo's approach, which employs chemicals to stiffen fabric to make it easier for robots to handle; the stiffening agent is washed out of the finished garment. The institute provided $1.5 million in grants to Levi's, Bluewater, and other companies to implement the technique.

Bluewater, and other companies to implement the technique.

Full Article

A Faster Way to Preserve Privacy Online

MIT News

Adam Zewe

December 7, 2022

Researchers at the Massachusetts Institute of Technology have developed a method for retrieving private information from a database that is approximately 30 times faster than comparable methods. Using this technique, users could search online databases without the server seeing their query, communicate without messaging apps knowing what they are saying or to whom, or access relevant online ads without sharing their interests with advertising servers. The researchers created the Simple PIR protocol to perform the bulk of the cryptographic work prior to the client sending a query. This involves producing a data structure that holds compressed information about database contents, which serves as a hint for the client. They developed the Double PIR scheme to reduce the size of the hint, generating a more compact hint with a fixed size.

Full Article

Amazon Wants to Kill the Barcode

CNet

Laura Hautala
December 9, 2022

E-commerce giant Amazon intends to render barcodes obsolete in sorting facilities so robots can better identify products visually. The company developed a camera system that can monitor items streaming down conveyor belts to ensure they match provided images. The system is trained on a library of product images and data on product dimensions, and Amazon claims the algorithm is 99% accurate. Amazon's artificial intelligence experts and roboticists aim to integrate the technology with robots that identify goods while handling them. The company said the multimodal identification system has accelerated package processing at facilities in Hamburg, Germany, and Barcelona, Spain.

Full Article

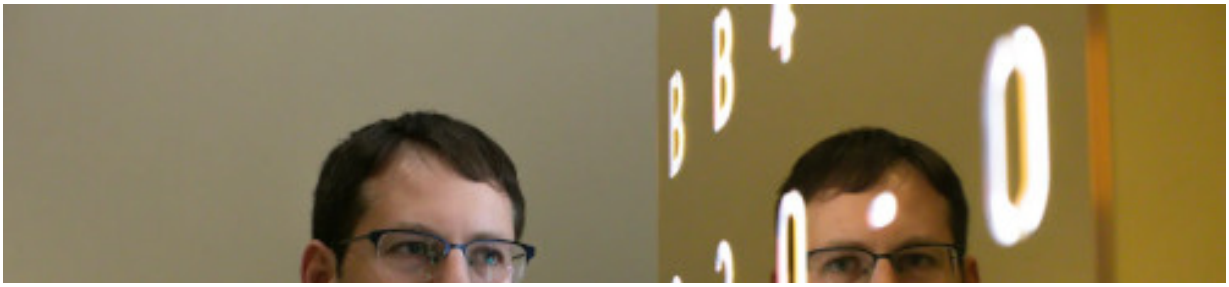
3D Imaging Model May Show Path to More Water-Efficient Plants

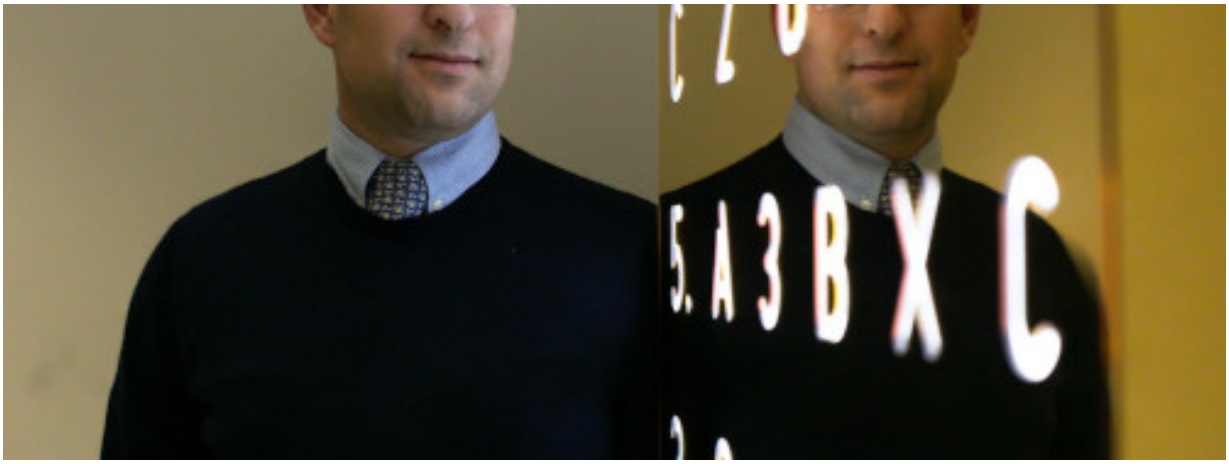
Penn State News

Francisco Tutella
December 9, 2022

Pennsylvania State University (Penn State) computer scientists and biologists developed a three-dimensional (3D) imaging model to more accurately investigate the efficiency of water use in plants. The model analyzes the interaction of stomatal guard cells with neighboring cells when undergoing physical changes. The researchers compiled and tested their pipeline using thale cress as a model plant, capturing 3D images of guard cells on the leaves with a specialized microscope. They used the 3D U-Net segmentation model as the basis for the 3D CellNet Model, which labeled images and quantified cell volumes more quickly and accurately than trained cell biologists. The model also outperformed existing algorithms for measuring 3D volumes of cells, and revealed unexpected guard cell behavior in response to external stimuli.

Full Article





Chatbots Could Change the World. Can You Trust Them?

The New York Times

Cade Metz

December 10, 2022

Potentially revolutionary chatbot technology cannot be relied on to always tell the truth or perform tasks correctly, while its potential for abuse is also concerning. Many experts envision chatbots like artificial intelligence (AI) laboratory OpenAI's ChatGPT or Google's Language Model for Dialogue Applications (LaMDA) replacing Internet search engines or even serving as personal tutors. However, data scientists like Aaron Margolis are finding flaws, which in LaMDA's case includes the mixing of facts with fiction because it was trained on information posted online. ChatGPT is not as proficient as LaMDA in free-flowing conversation, but like Google's AI, was trained on digital text gathered from the Internet. Such technologies have been replicated and widely distributed, but their developers cannot deter people from using the chatbots to spread misinformation.

Full Article

*May Require Paid Registration

AI Enables More Effective Humanitarian Action

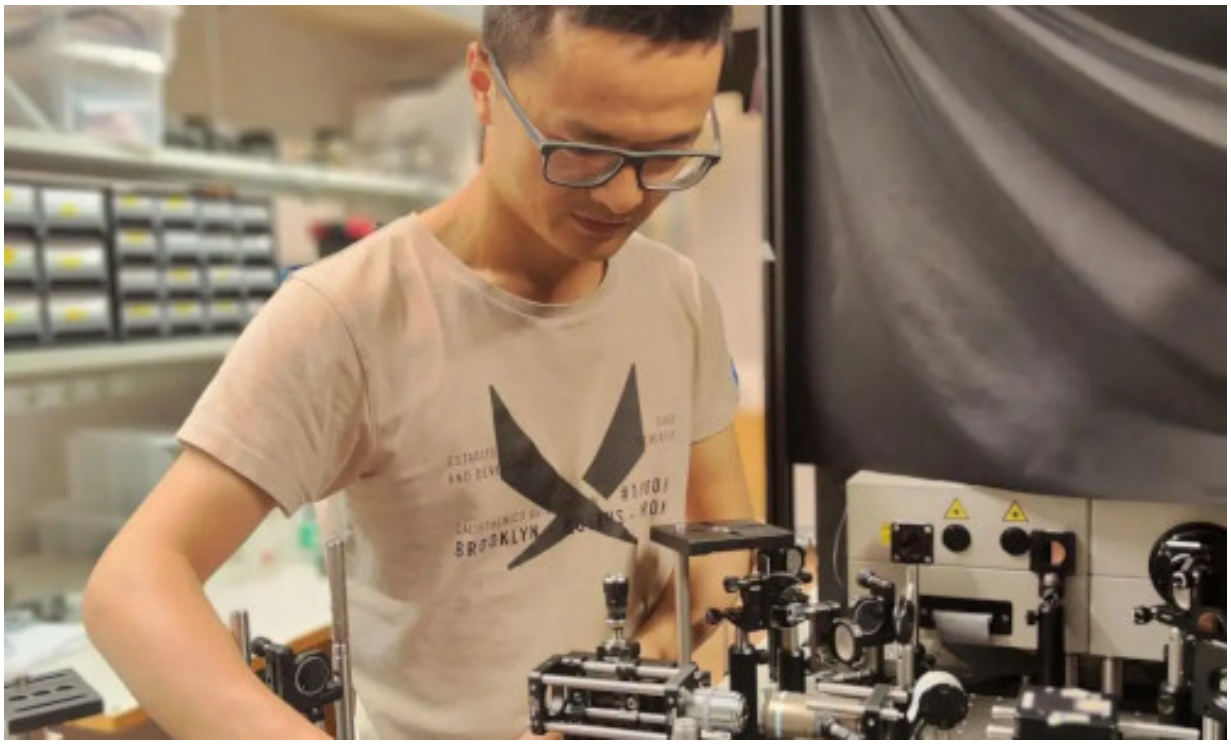
EPFL (Switzerland)

December 12, 2022

An artificial intelligence (AI) program developed by researchers at Switzerland's EPFL and ETH Zurich, the International Committee of the Red Cross, and Qatar's Hamad Bin Khalifa University can estimate population density using only a regional-level rough estimate. The Pomelo program aggregates public data from remote sensing systems based on weightings learned by a neural network. The data includes building counts, average building sizes, proximity to roads, road maps, and night lighting. In tests using data from several African countries, Pomelo was found to generate accurate population maps for areas as

Pomelo was found to generate accurate population maps for areas as small as a hectare (about 2.5 acres) and with populations of 1,000 to 2,000 residents.

Full Article



Light-Based Computer Could Outpace Traditional Electrical Chip Designs

New Scientist

Matthew Sparkes

December 9, 2022

Researchers at Finland's Aalto University have developed a computer that uses light instead of electricity to perform calculations. Unlike previous optical computers with complex hardware and limited functionality, the researchers used existing manufacturing techniques to build optical logic gates using a single layer of molybdenum disulphide crystals only 0.65 nanometers (billionths of a meter) thick. Additionally, the bits are represented by clockwise-polarized or anticlockwise-polarized light, and the crystalline materials are sensitive to the direction of the spin of the polarized light beams. The researchers showed that the optical gates could be used to create traditional XNOR, NOR, AND, XOR, OR, and NAND gates. Aalto's Yi Zhang said, "The biggest advantage is the super-fast speed of optical chips over traditional chips."

Full Article

*May Require Paid Registration

Supernova Algorithm Classifies 1,000 Dying Stars Without Error

Space.com

Robert Lea

December 12, 2022

California Institute of Technology (Caltech) astronomers have classified 1,000 supernovas caused by dying stars with the SNIascore algorithm. SNIascore generated the catalog from data compiled by the Zwicky Transient Facility (ZTF), a sky survey instrument. The algorithm classifies Type Ia supernovas caused by explosions that emit light so uniform as to be termed "standard candles," in conjunction with the Spectral Energy Distribution Machine. The ZTF team is accumulating a reliable supernova dataset for use in probing the physics of these phenomena. Caltech's Christoffer Fremling said the researchers found SNIascore has not misclassified a supernova since April 2021, when it classified its first.

Full Article

Bolstering Safety of Self-Driving Cars with Deep Learning-Based Object Detection System

Incheon National University (South Korea)

December 12, 2022

An international team of researchers led by Gwanggil Jeon at South

An international team of researchers led by Gwangyil Jeon at South Korea's Incheon National University has developed a deep-learning-based Internet of Things-enabled three-dimensional (3D) object detection system for autonomous vehicles. Jeon said the researchers based the detection model on the YOLOv3 identification algorithm and fed the system red-green-blue images and point cloud data to generate classification labels and bounding boxes with confidence scores. Tests using the Lyft dataset showed YOLOv3 could detect two-dimensional and 3D objects with more than 96% accuracy. The researchers envision the method's application to self-driving vehicles, autonomous parking, autonomous delivery, future autonomous robots, and situations requiring object/obstacle detection, tracking, and visual localization.

Full Article

Wearable Belt with Sensors Accurately Monitors Heart Failure 24/7

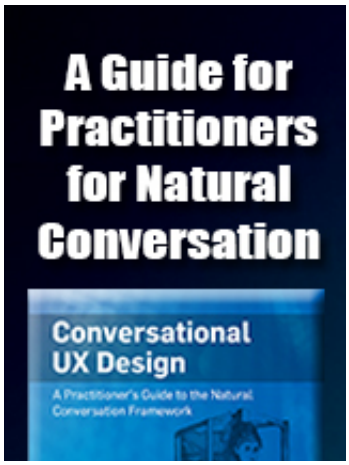
Florida Atlantic University News Desk

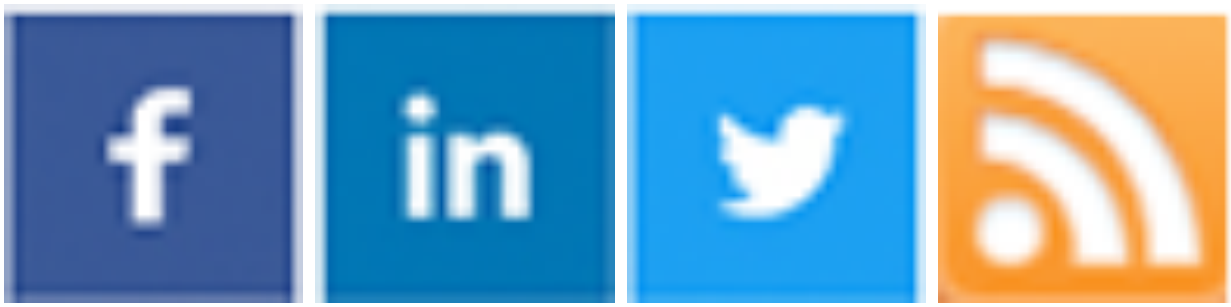
Gisele Galoustian

December 12, 2022

Scientists at Florida Atlantic University (FAU) have developed a sensor-equipped wearable belt that can monitor the physiological parameters associated with heart failure in real time. The system uses different sensors to monitor thoracic impedance, electrocardiogram, heart rate, and motion activity. The researchers tested the device on users who were sitting, standing, lying down, and walking, with results for each sensor acquired sequentially. The results indicated all the sensors tracked changes for all conditions and flagged minuscule changes in thoracic impedance. "Continuous and real-time monitoring of heart failure symptoms could alert patients and their healthcare providers of the patient's declining health," said FAU's Waseem Asghar.

Full Article





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