

## UC San Diego opens drone research facility

UC San Diego recently opened an outdoor research facility for unmanned aerial vehicles. The aerodrome is part of a longer-range plan at the UC San Diego Contextual Robotics Institute to create a large, indoor-outdoor laboratory for unmanned aerial vehicles on campus. The aerodrome is made up of a 30-foot-tall mesh cage over a 2,500-square-foot outdoor area and will be primarily open to university research. "We expect to see new research results on control of swarms of small UAVs and on the coordination between humans and robots," said computer science professor Henrik Christensen, who leads the Contextual Robotics Institute. The new UAV aerodrome is in part supported by funds from Northrop Grumman and Qualcomm.



Learn more: [bit.ly/UCSanDiegoaerodrome](http://bit.ly/UCSanDiegoaerodrome)

## Data storage innovator elected to National Academy of Engineering

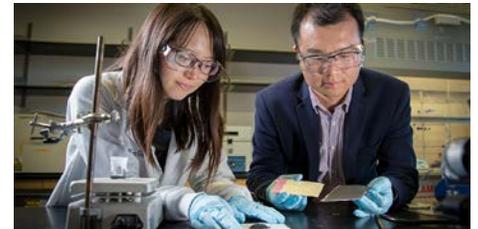


Eric Fullerton, a professor of electrical and computer engineering and of nanoengineering at the Jacobs School and director of the UC San Diego Center for Memory and Recording Research, has been elected to the National Academy of Engineering. He was recognized for his pioneering work advancing magnetic recording media. Fullerton invented and developed multilayer magnetic materials that enabled hard disk drives to store exponentially more data than was previously possible. Fullerton, who earned a doctorate in physics from UC San Diego, joined the Jacobs School of Engineering faculty in 2007 after years working in industry at both IBM and Hitachi Global Storage Technologies.

Learn more: [bit.ly/FullertonNAE](http://bit.ly/FullertonNAE)

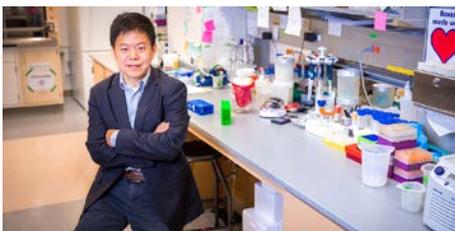
## Making spent lithium ion cathodes new again

Nanoengineers at UC San Diego have developed a new process for reusing cathodes from spent lithium ion batteries that is twice as energy efficient as existing techniques. New batteries built with the regenerated cathodes had the same charge-storage capacity, charging time and lifetime as batteries with new cathodes. The process, developed in the lab of nanoengineering professor Zheng Chen and published in *Green Chemistry*, involves harvesting the degraded cathode particles from a used battery and then boiling and heat treating them. "The price of lithium, cobalt and nickel has increased significantly. Recovering these expensive materials could lower battery costs," said Chen, who is a faculty member of the Sustainable Power and Energy Center at UC San Diego. Today, less than 5 percent of used lithium ion batteries are recycled.



Learn more: [bit.ly/RecycledCathodes](http://bit.ly/RecycledCathodes)

## A remote-controlled cancer immunotherapy system



Bioengineers at UC San Diego have used ultrasound to activate genetically modified, live immune T cells so that they recognize and kill cancer cells. The new platform offers a possible path forward for non-invasively and remotely activating just the CAR-T cells that are near a specific tumor. "CAR-T cell therapy is becoming a paradigm-shifting therapeutic approach for cancer treatment," said UC San Diego bioengineering professor Peter Yingxiao Wang. "However, major challenges remain before CAR-based immunotherapy can become widely adopted. For instance, the non-specific targeting of CAR-T cells against nonmalignant tissues can be life-threatening. This work could ultimately lead to an unprecedented precision and efficiency in CAR-T cell immunotherapy against solid tumors, while minimizing off-tumor toxicities."

Learn more: [bit.ly/PeterWang](http://bit.ly/PeterWang)

## Online MicroMasters in Algorithms and Data Structures



UC San Diego launched an online course series designed to help students master some of the key algorithmic programming techniques employers are looking for. The eight-part Algorithms and Data Structures series covers topics in computer science, math, biology and the life sciences. The courses are taught by a team of six UC San Diego-affiliated professors from the computer science, computational biology, and data science disciplines. Learn more: [bit.ly/MicroMasters](http://bit.ly/MicroMasters)

## Q&A with Stefan Savage, cybersecurity expert and MacArthur Genius

UC San Diego computer science professor Stefan Savage, a 2017 MacArthur Foundation fellow, shares security tips and points to new research directions in a Q&A. Regular backups of your computer, for instance, are the best defense against ransomware. Asked about future projects, Savage responded: "We're looking at a range of issues including empirical measures of cyber risk (i.e., what kinds of defenses or behaviors actually lower the chances that our machines will be compromised and by how much), and exploring how various human factors play a role in people using (and using correctly) appropriate security measures. We also are doing some work on aviation security and ongoing efforts looking at the intersection of computer security and law enforcement that we think will yield some exciting results."

Learn more: [bit.ly/PrivacyAdvice](http://bit.ly/PrivacyAdvice)



## Research Expo 2018



Be inspired by exciting research, talented graduate students, and opportunities to connect with faculty, students, alumni and industry professionals at the annual Research Expo at UC San Diego. Get first-hand insight into the research of more than 200 graduate students, attend 20-minute faculty talks focused on industry-relevant research, and find out what's happening at San Diego's innovation powerhouse on Thursday, April 19.

Learn more: [bit.ly/RExp018](http://bit.ly/RExp018)



## SIGN UP FOR THE JACOBS SCHOOL MONTHLY EMAIL

A monthly news digest from the UC San Diego Jacobs School of Engineering.

[bit.ly/JacobsSchoolEmail](http://bit.ly/JacobsSchoolEmail)



Contact newsletter editor, Daniel Kane: [dbkane@ucsd.edu](mailto:dbkane@ucsd.edu)