

Defense Systems

NEWS DIGEST

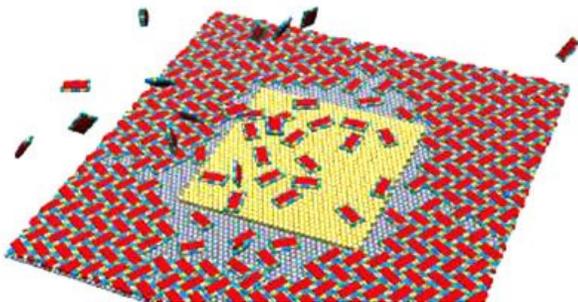
11 APRIL 2017 - THE LATEST IN DEFENSE SYSTEM NEWS



“Mad Scientists' Discuss Emerging Tech as Army Releases Robotics and Autonomous Systems Strategy

Swarms of robots scouring enemy terrain ahead of ground troops outfitted in high-tech exoskeleton suits are among the many ideas proposed in the Army's new strategy on robotic and autonomous systems. In the not too distant future, Army leaders believe war will be far more complex, calling...

Advanced Materials



Borophene Takes Big Steps Towards Electronic Devices

Researchers at Northwestern University—led by Mark Hersam, a Northwestern professor at the forefront of investigating the potential of a variety of 2D materials—have taken a significant step beyond merely characterizing borophene and have started to move towards making nanoelectronic devices from it. In research described in...



3D Printing Using Aerospace-Grade Carbon Fiber Composites

For the first time researchers at Lawrence Livermore National Laboratory (LLNL) have 3D printed aerospace-grade carbon fiber composites, paving the way for better control and optimization of the lightweight material that is stronger than steel. However, the LLNL researchers reported printing numerous complex 3D structures using...

Autonomous Systems



Common Unmanned Surface Vehicle May Take on Missions Beyond Minesweeping

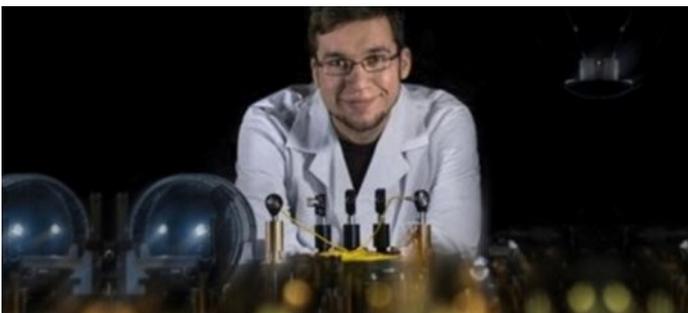
Now in water testing: an unmanned surface boat designed to launch from the littoral combat ship to assist with the location and destruction of undersea mines. But according to the boat's creators at Textron Systems, the technology may have a much broader range of uses in the future. The system in question is the common unmanned surface vehicle [CUSV], a 39-foot vessel that...



Carnegie Mellon Led Advanced Robotics Venture Receives \$250 Million

An independent institute founded by Carnegie Mellon University will receive more than \$250 million to launch an advanced robotics manufacturing institute in Pittsburgh, the U.S. Department of Defense announced Friday. The Department of Defense awarded the public-private Manufacturing USA institute to American Robotics, a nonprofit venture led by Carnegie Mellon, with...

Directed Energy



Impossible (but Working!) Recipe for Ultrashort Laser Pulses

Pulse lasers built entirely on optical fibers are increasingly readily being used by industry. Optical scientists from the Warsaw Laser Centre of the Institute of Physical Chemistry of the Polish Academy of Sciences and the Faculty of Physics of the University of Warsaw have generated ultrashort laser pulses in an optical fiber using a method previously considered as physically impossible...



Army Demos Combat Vehicle/Laser Weapon Integration at UAS Hard-Kill Challenge

Members of the USASMD/ARSTRAT Technical Center's Air and Missile Defense Directorate participated in the Joint Improvised-Threat Defeat Organization (JIDO), UAS Hard-Kill Challenge at White Sands Missile Range, New Mexico. During the challenge, the Mobile Expeditionary High Energy Laser 2.0, or MEHEL 2.0, demonstrated its counter-unmanned aircraft system (C-UAS)...

Energetics



Long-Lasting Flow Battery Could Run More Than a Decade

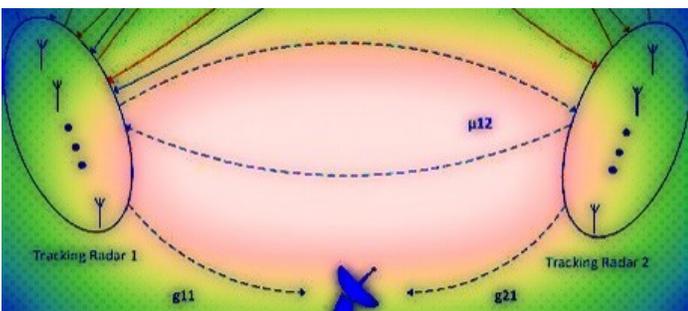
A new flow battery from the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) stores energy in organic molecules dissolved in neutral pH water. Losing only one percent of its capacity per 1000 cycles, the non-toxic, non-corrosive device offers the potential to significantly decrease the costs of production. "Lithium ion batteries don't even survive 1000..."



Robot Powertrain Moving Towards Energy Autonomy

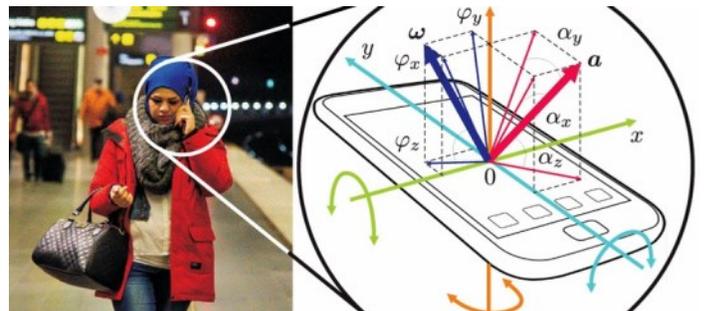
Inspecting the condition of dykes and other sea defence structures is typically a task for robots, working in a team and in a highly autonomous way. But if they move around across the dykes, perform tests and communicate the for six hours a day, they use a lot of energy. Charging stations are not a very realistic scenario. Douwe Dresscher did research on making the robot as autonomous as...

Military Sensing



Game Theoretic Analysis for MIMO Radars with Multiple Targets

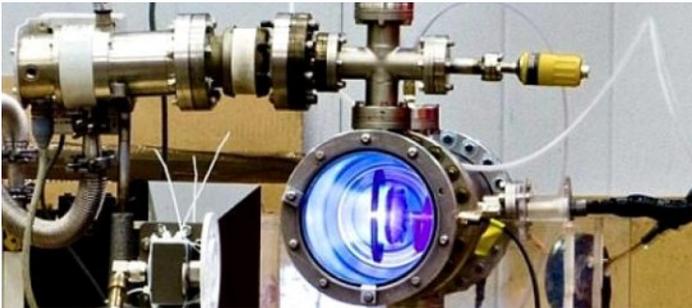
This paper considers a distributed beamforming and resource allocation technique for a radar system in the presence of multiple targets. The primary objective of each radar is to minimize its transmission power while attaining an optimal beamforming strategy and satisfying a certain detection criterion for each of the targets. Therefore, we use convex optimization methods together with...



Learning Human Identity from Motion Patterns

Presented is a large-scale study exploring the capability of temporal deep neural networks to interpret natural human kinematics and introduce the first method for active biometric authentication with mobile inertial sensors. At Google, we have created a first-of-its-kind data set of human movements, passively collected by 1500 volunteers using their smartphones over several months...

Non-Lethal Weapons



Air Force Integrating High-Power Electromagnetics into Cyber, Electronic Warfare

RF and microwave experts at Booz Allen Hamilton in McLean, Va., are helping U.S. Air Force researchers find ways to integrate high-power electromagnetics (HPEM) into military cyber and electronic warfare (EW) systems. Officials of the Air Force Research Laboratory (AFRL) Directed Energy Directorate's High-Powered Electromagnetics Division (RDH) at Kirtland Air Force Base, N.M....



Army Patents Indirect Fire Munition Non-Lethal Cargo Carrier Mortar

The IDFM Non-Lethal Cargo Carrier Mortar deploys non-lethal sub-munitions to an intended target. The cargo carrier mortar includes a deceleration system which allows for the discarded mortar to descend at a controlled non-free fall velocity thereby minimizing the risk of injury or collateral damage from the mortar. The cargo carrier mortar is compatible with existing standard equipment...

RMQSI



Researchers Navigating Ways to Avoid Aircraft Icing

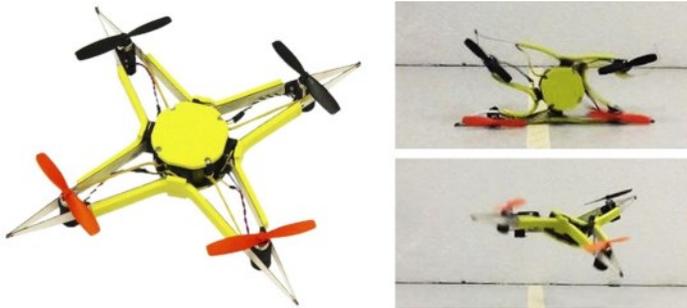
Researchers at the U.S. Naval Research Laboratory think they are on the path to giving aircraft a way to avoid potentially hazardous icing conditions from a safe distance. Clouds composed of supercooled liquid can cause aircraft to ice over quickly because the liquid water droplets are below the freezing point and will freeze after contact with aircraft surfaces. Supercooled liquid clouds are...



Shadow RQ-7 Drone Goes AWOL, Ends up Crashing into Tree 623 Miles Away

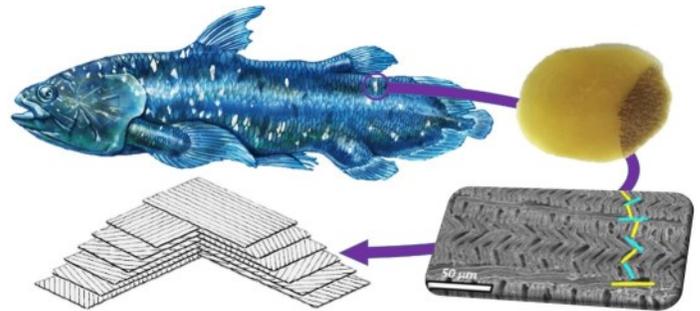
The US Army is investigating how one of its drones took an unplanned 623-mile excursion and ended up stuck in a tree two states away. The Shadow RQ-7 drone was launched by soldiers from the 2nd Stryker Brigade of the 7th Infantry Division. It was supposed to provide the troops with imaging support, however almost immediately after launch it lost contact with its ground station...

Survivability & Vulnerability



This Drone is Both Stiff and Squishy to Survive Crashes

Drones are designed to fly, but crashes are a fact of life. Some commercial drones employ techniques like propeller guards and cages to at least protect the drone, but they're not exactly effective all the time and add weight. Researchers from École Polytechnique Fédérale de Lausanne, or EPFL, in Switzerland may have come up with an effective solution inspired by Mother Nature herself...



Piscine Defense: the Scales of Arapaima, Coelacanth and Alligator Gar

Characteristics of the armored scales of three large fish, the arapaima, coelacanth, and alligator gar are compared with a focus on their unique structure-mechanical property relationships and their specialized ability to provide protection from predatory pressures. The ultimate goal is providing bio-inspiration for manmade materials. The coelacanth has overlapping elasmoid scales that...

Weapon Systems



Next-Generation Fires Systems Improve Mission Command, Boost Lethality

Soldiers view live-stream full-motion video from unmanned aerial vehicles via a smartphone. They access 3D digital maps to send precision target coordinates. Soldiers are relying on these advanced technologies to improve lethality and maintain battlefield dominance. These are among the improvements that will be embedded in future fire-support capabilities. The Army has started...



M777A2 Extend Range Howitzer Program Looking to Demonstrate 70KM Range

Picatinny Arsenal engineers have fired a newly modified M777A2 howitzer at Yuma Proving Ground, Arizona, completing the next step towards expanding the system's current firing range. Engineers put together an integration test bed for the M777A2 Extended Range (M777ER) howitzer program, incorporating a 55 caliber cannon tube on the M777A2 towed howitzer. The modification add-

Announcements & Events



JASP FY18 Proposal Review Meeting

The JASP FY18 Proposal Review Meeting will take place over the course of three days and will involve detailed briefings of FY18 Proposals to be reviewed, discussed, and approved for future work with JASPO. The briefings will be presented to the JASPO Board Members and other attendees that will include Military, DoD Civilians and Industry.

DATE: April 25-27, 2017



2017 Threat Weapon and Effects Training

This training draws upon threat exploitation, live fire testing and combat experience to provide a complete threat lethality picture. It addresses issues related to enemy weapon systems lethality within the broad considerations of system design and employment. Hands-on experience is provided with threat munitions, test articles and damaged aircraft hardware.

DATE: May 2-4, 2017



4th Biennial Strike Challenge

Strike Challenge affords industry an opportunity to provide interactive demonstrations of domestic capability (DOMOPS) and specialized response systems. The focus is on man-pack and light mobility support equipment designed for light responder / specialized unit use in emergency response, survivability, security, search and rescue, and 'special' operations.

DATE: August 15-17, 2017

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