16July17

The Winter-Proof Drone That Will Watch the Arctic

A high-payload, low-cost drone would change Arctic science forever. But one challenge remains: making it freeze-proof.


Navmar Applied Science Corp.

By David Hambling Jul 13, 2017

The wide-open spaces of the Arctic are a dream for drone science. A maneuverable eye in the sky has made unmanned aircraft a go-to method for counting sea lion populations, mapping ice cover, and perhaps one day forsearch-and-rescue operations off Alaska's coast.

PNNL eventually turned to Navmar Applied Sciences Corporation's TigerShark military-grade surveillance drone. Although capable in many ways, the specs that interested PNNL were its ability to carry heavy payloads and its longer-than-average flight time. Originally built in 2005, the TigerShark has a proven track record with some 200 aircraft chalking up 100,000 flight hours among them.

With some adjustments, Navmar created the weather-hardened ArcticShark, a drone with a 22-foot wingspan, a max speed of 75 mph that can climb to 15,000 feet, and can fly while weighing in at 625 pounds. To top it off, the ArcticShark also delivers a hefty four kilowatts of power to its onboard scientific weather instruments—all at a price that was cheaper than anticipated.
http://www.popularmechanics.com/flight/drones/a27278/arctic-shark-weather-drone/

The Drone Racing League (DRL) Builds The Fastest Racing Drone

DRL Sets the GUINNESS WORLD RECORDS™ Title for the Fastest ground speed by a Battery-powered Remote-controlled Quadcopter

Today, the Drone Racing League (DRL) tested the fastest racing drone, and set the GUINNESS WORLD RECORDS™ title for the fastest ground speed by a battery-powered remote-controlled quadcopter. The DRL RacerX, weighing only 800 grams (1.76 pounds), zooms at a top speed of 179.6 miles per hour.

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In order to set the GUINNESS WORLD RECORDS™ achievement, the drone needed to fly back and forth across a measured course of 100 m (328 ft.), with the official record set as the average of the top speed achieved on each of those flights. Therefore, the official speed measured for the GUINNESS WORLD RECORDS™ title is **163.5 miles per hour**.

Gury flew the drone along a field in the state of New York and clocked in at the record speed while a GUINNESS WORLD RECORDS™ adjudicator was on-site to verify the attempt. Earlier, prototypes of the drone burst into flames when hitting its highest point of acceleration due to the amount of power being applied. http://uasweekly.com/2017/07/14/drone-racing-league-drl-builds-fastest-racing-drone/

Dancing Cubesats

BY DEBRA WERNER|JULY/AUGUST 2017 | Aerospace America

COMING UP WITH BEST MEANS OF SQUEEZING PROPULSION INTO A TINY PACKAGE

Space-industry watchers have little doubt that the tally of cubesat launches in 2017 will demolish the previous record set in 2014 when 132 of these miniature satellites were launched. Already, government agencies, universities and companies have launched 142 cubesats as of June 1.

Once seen mainly as a way to give students hands-on experience, cubesats have proved so useful that NASA, the U.S. Air Force, intelligence agencies and Silicon Valley startups are devising multimillion-dollar Earth imaging and communications missions around them. With millions of dollars and key objectives now on the line, many cubesat developers want their spacecraft to have propulsion.

Cubesats could then maneuver to their optimal orbits instead of making the best of their drop-off points after hitching a ride on a rocket with a much larger satellite. **The cubesats could resist atmospheric drag and remain in space for years**, and at the end of their missions, be de-orbited to avoid creating debris.

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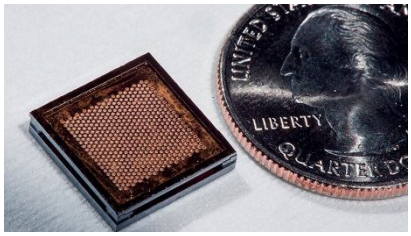

Accion Systems' ion electrospray thruster runs on a propellant that flows through hundreds of microscopic emitters contained in a microchip. Credit: Accion Systems

Some concepts are forms of solar electric propulsion, in which solar cells on the exterior of the cubesat would convert sunlight to electricity that can be applied in a variety of ways to create propulsion. Other concepts are takeoffs on traditional chemical propulsion. **Here's a look at some of the technologies on the horizon**:

HALL-EFFECT THRUSTERS - Hall-effect thrusters trap electrons and make them collide with the atoms of a propellant, and the resulting ionized gas is accelerated with magnetic and electrostatic fields.

ELECTROSPRAY THRUSTERS - These apply a charge to an ionic liquid propellant before accelerating it with an electric field.

ION THRUSTERS - These accelerate ions with electrical power, and can be fueled by iodine or xenon.

RADIO FREQUENCY THRUSTERS - These convert electrical power into radio waves that act on a propellant to generate thrust.

RESISTOJET PROPULSION - These concepts pass electricity through a resistor to generate heat that produces thrust differently depending on the design.

MICRO-CAVITY DISCHARGE - Electrodes heat the propellant, turning it into plasma in a micrometer-diameter cavity before discharging the plasma through a nozzle.

CHEMICAL PROPULSION - Various groups are adapting the basic concept of emitting gases or vapors to generate thrust. https://aerospaceamerica.aiaa.org/features/dancing-cubesats/

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Surge in crop circles caused by drone users, police say

Harry Yorke 12 JULY 2017 • 7:17PM

Arecent surge in crop circles is being caused by drone users who upload their aerial footage on social media, a police force has said as it announced a crackdown on farm vandals. Wiltshire Police issued the warning to the public yesterday following a spate of incidents in recent months, which officers said was being fuelled by scammers who generate publicity online in order to make money from advertising.

So far this year the force has been alerted to 16 incidents, with a recent circle in Alton Barnes measuring 200 acres in diameter. However, the true number is thought to be far higher because many farmers do not come forward. Speaking to *The Daily Telegraph*, rural crime officer Marc Jackson said Wiltshire had been disproportionately affected due to its proximity to Stonehenge, adding that they were most commonly reported near to cultural heritage sites and busy main roads.
http://www.telegraph.co.uk/news/2017/07/12/surge-crop-circles-caused-drone-users-police-say/

Google sister company Project Wing chooses Googong as autonomous drone delivery test site Elliot Williams JULY 16, 2017

Canberra and its surrounds have been announced as the major testing site of the X company's (formerly Google X) autonomous drone delivery system. Project Wing co-leader James Ryan Burgess with the delivery drone set to be trialled at Fernleigh Park.

Project Wing, a sister company of Google, arrived in Googong on Saturday to test their latest innovation. Co-leader of the project James Ryan Burgess said the company plans to be here for the foreseeable future.

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 Project Wing co-leader James Ryan Burgess. Photo: Sitthixay Ditthavong

Mr Burgess said the drone is capable of delivering up to 1.5 kilograms of goods, and could carry anything from milk to medicines.

He said that having prior experience in Australia and a good relationship with the Civil Aviation Safety Authority helped the decision to come to the region. http://www.brisbanetimes.com.au/act-news/google-sister-company-project-wing-chooses-googong-as-autonomous-drone-delivery-test-site-20170715-gxbu0o.html

Israeli Company Flytrex Wants to Be the FedEx of Drone Delivery

The Israeli company wants to use its air-traffic management software to standardize drone deliveries by year's end. BY MARCO MARGARITOFF JULY 14, 2017

 FLYTREX AVIATION

Unmanned aerial vehicles (UAVs) are becoming the go-to method to cut costs and the increase delivery efficiency. Israeli company Flytrex is eager to dominate this field and become the defacto leader in autonomous drone delivery systems, having just recently successfully merged with Ukrainian postal service UkrPoshta to create a pilot program to run tests.

"It's one thing to design a nice drone to deliver goods, but it's much more complicated to take charge of the whole system," said Flytrex founder and CEO Yariv Bash, according to Israel21c. Flytrex's software "can reduce traffic accidents and save lives," Bash said. The "idea is to offer better services for a lower rate. Drones do it faster and cheaper than any other means." This is certainly true, as we just recently learned from a study that drone delivery is not only more efficient but far less harmful to the environment than traditional truck delivery.

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FLYTREX AVIATION

According to Israel21c, the Flytrex drone software will delegate UAVs carrying around 6.5 pounds for as far as 14 miles round-trip, at speeds of up to 14 miles per hour. Apparently, delivery time will take less than half an hour from successful ordering to arrival at the destination. http://www.thedrive.com/aerial/12350/israeli-company-flytrex-wants-to-be-the-fedex-of-drone-delivery

17July17

Here's a Free Study Guide for Passing the FAA's Commercial Drone Test

JUN 19, 2017, JAYPHEN SIMPSON

If you want to fly a drone for commercial purposes in the US, you first have to pass **the FAA's Part 107** sUAS test. This free 1 hour 45 minute guide from **Tony Northrup** is a hugely useful resource for your studies. Flying for commercial purposes means things like shooting aerial photos for-profit, taking aerial stock footage, filming for a company or even taking footage of a wedding from the skies to mix in with your regular wedding photography.

Even if you are not looking to get certified, this video will teach you invaluable knowledge to help you fly your drone safely and responsibly. You'll learn about weather, different flight spaces, how to deal with other pilots, and many more topics. https://petapixel.com/2017/06/19/heres-free-study-guide-passing-faas-commercial-drone-test/

Russian Soyuz Rocket Launches 73 Satellites Into Orbit By Jeff Foust, SpaceNews Writer | July 16, 2017

WASHINGTON — A Soyuz rocket successfully launched 73 satellites, including spacecraft for **four companies' cubesat constellations,** July 14.

The Soyuz-2.1a lifted off from the Baikonur Cosmodrome at 2:36 a.m. Eastern. The rocket deployed the primary payload, the Kanopus-V-IK remote sensing satellite, about an hour after launch, followed by **72 smallsat secondary payloads** over the next seven hours.

Among the secondary payloads were 48 Dove satellites from Planet, completing the company's initial constellation of remote sensing cubesats. Mike Safyan, director of launch at Planet, said in a

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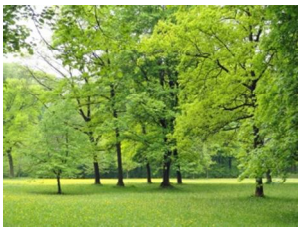
July 14 statement that all the satellites had separated from the rocket's Fregat upper stage as planned, starting the process of positioning the satellites in their desired slots in sun-synchronous orbit. "In total, the commissioning and orbital spacing will take a handful of months, but the Doves will begin imaging much sooner than that," he said.


An artist's illustration of the release of small satellites from a Fregat upper stage during the July 14 launch of 73 satellites on a Russian Soyuz rocket. *Credit: Glavkosmos*
https://www.space.com/37510-soyuz-rocket-launches-73-satellites-into-orbit.html

July 16, 2017

City of Raleigh Seeking Public Input on Drone Ordinance Juan Plaza



On June 29, the Parks, Recreation and Cultural Resources Department (PRCR) of the City of Raleigh made an announcement on their website seeking public input on a draft policy regarding the use of unmanned aerial vehicles (UAV) in public parks. The draft policy defines UAV or drone as any aircraft, which do not carry a human pilot and is controlled by radio frequency via a pilot on the ground. It is important to note that this proposed policy only covers UAVs flown for hobby or recreational purposes.

The announcement made abundantly clear that use of UAV's for commercial, business or monetary purposes are controlled by different local, state and Federal regulations, namely the North Carolina Dept. of Transportation at the FAA. The City of Raleigh through PRCR **has identified UAV flying for recreational purposes as a popular activity that is continuing to grow, and therefore intends to bring regulation to improve safety and deter incidents and accidents.**

This first meeting of the consultation process took place on Thursday July 13, and it was attended by about 30 people wishing to express their opinion regarding the proposed ordinance. In general, their comments were supportive of the proposed legislation. Some specific associations such as the

Drone Racers chapter of the city of Raleigh made specific proposals they would like to see included in the legislation. http://www.expouav.com/news/latest/city-raleigh-seeking-public-input-drone-ordinance/

Drones deployed to detect emerald ash borers in Boulder

Team flies 'birds' at three locations in test of technology's effectiveness


Paul Aiken, The Daily Camera

Darren Ceckanowicz, EV Technical Director of the Environmental Program at Colorado College readies a drone to take aerial images of ash trees damaged by the emerald ash borer in Boulder on Thursday. For more photos and video go to dailycamera.com

CHARLIE BRENNAN | brennanc@dailycamera.com | Boulder Daily Camera | July 14, 2017

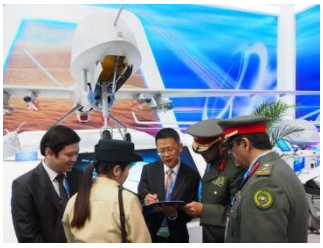
Drones may be a key tool to the future of battling emerald ash borer and other blights that can impact the urban forest, and that buzzing some might have heard in southeast Boulder on Thursday was the sound of a team setting out to prove just that. From three separate locations, a group of scientists and researchers sent drones as high as 335 feet over areas including ash trees showing varying levels of damage from the emerald ash borer, an invasive green jewel beetle that feeds on the ash tree species.

"What we're really interested in is early detection," said Dan Staley, principal of Arbor Drone, a consulting firm based in Aurora specializing in aerial urban forestry. "The very first indicators of emerald ash borer is what we're trying to show." http://www.denverpost.com/2017/07/14/boulder-drones-emerald-ash-borers/

18July17

Unable to Buy U.S. Military Drones, Allies Place Orders With China

Several countries in the Mideast and Africa have deployed weapons in conflicts after buying from Beijing—at lower cost


Saudi officers and Chinese sales staff with the CH-5 drone at Airshow China in November. PHOTO: JEREMY PAGE/THE WALL STREET JOURNAL

The U.S. has long refused to sell the most powerful U.S.-made drones to most countries, fearing they might fall into hostile hands, be used to suppress civil unrest or, in the Mideast, erode Israel's military dominance. The U.K. is the only foreign country that has operated armed Predators and Reapers, the most potent U.S. systems for offensive drone strikes, according to people familiar with U.S. sales.

The Obama administration, while seeking to facilitate exports under close regulation, led efforts to forge a global "drone code" that would curb proliferation and keep the weapons from misuse.

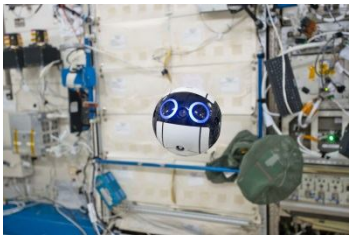
But China is filling the void. State companies are selling aircraft resembling General Atomics's Predator and Reaper drones at a fraction of the cost to U.S. allies and partners, and to other buyers.

China's sales have enabled multiple countries—including some with weak legal systems and scant public oversight of the military—to use unmanned aerial vehicles to spy and kill remotely as the U.S. has done on a large scale since 9/11. https://www.wsj.com/articles/unable-to-buy-u-s-military-drones-allies-place-orders-with-china-1500301716

Meet the International Space Station's adorable camera drone

The 'Int-Ball' will allow astronauts to spend more time working on experiments.

Nick Summers, @nisummers 07.17.17 in Space


JAXA/NASA

Astronauts on board the International Space Station have a new robotic companion to play around with. The Japan Aerospace Exploration Agency (JAXA) has released the first images shot by the "Int-Ball," a spherical camera that floats around alongside the rest of the crew. With its monochrome

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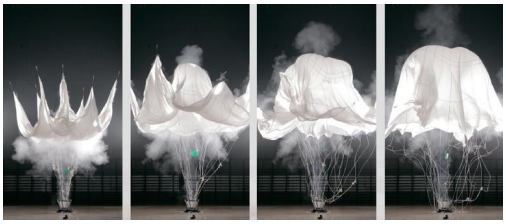
paint job and blue, circular eyes, it looks a little like *Wall-E*'s Eve — or at least her head, in some kind of prototype form. Notably, the Int-Ball can move around autonomously or be controlled by operators back on Earth. The images are transferred in near real-time allowing JAXA staff to quickly evaluate problems and offer possible solutions to ISS residents.
https://www.engadget.com/2017/07/17/int-ball-camera-drone-international-space-station/

Pyrotechnic parachute a proposed solution for falling commercial drones

In advance of clear FAA rules, companies tout innovative safety solutions

By Greg Nichols for Robotics | July 17, 2017 | Topic: Robotics



There's a company in Israel that wants to make parachutes mandatory on commercial drones.

ParaZero developed the first fully autonomous safety suite for drones, which includes a parachute. The system relies on emergency decision algorithms to determine when something is wrong during flight. In the case of a collision or loss of power, for example, the system will deploy a parachute to keep the drone from plummeting like a propellor-wielding rock.
http://www.zdnet.com/article/pyrotechnic-parachute-a-proposed-solution-for-falling-commercial-drones/

This Australian Teenager Just Made A Longer Lasting Drone

Rae Johnston Jul 18, 2017Image: UWS

"Swift" is an unmanned aerial vehicle that can fly five times longer than drones currently on the market - it can be airborne for more than **six hours** before the battery runs out.

"What I have created is not only far cheaper, but can be operated remotely and is easy to use. It is lightweight and can glide safely to a stop should it lose power, instead of current drones which drop

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out of the sky when their battery runs out." The winged device is two metres in length and weighs six kilograms. https://www.gizmodo.com.au/2017/07/this-australian-teenager-just-made-a-longer-lasting-drone/

Measure Announces Aerial Solar Plant Drone Inspection Services 12 Jul 2017

Measure, a provider of enterprise drone services, has announced new services for the solar energy industry with the introduction of drone inspection solutions for solar plant maintenance.

Solar panel inspections identify defective or damaged panels that are limiting energy output. Measure's temperature-specific thermal orthomosaics store temperature in every pixel for faster and more accurate pinpointing of faulty panel infrastructure.

Measure's solutions also include site overview and maintenance, site shading and terrain analysis, thermal inverter scans, tracker misalignment detection and vegetation management. Benefits include improved efficiency and safety through reduced inspection time and elimination of field work. On a site generating 21 MW, for example, Measure can complete an inspection in 7 hours instead of weeks. http://www.unmannedsystemstechnology.com/2017/07/measure-announces-aerial-solar-plant-drone-inspection-services/

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NAVIATOR HYBRID UNMANNED VEHICLE COMPLETES FIRST AIR/WATER DRONE INSPECTION OF HIGH VALUE ASSETS AUVSI NEWS JUL 14, 2017

On June 18, the first combination aerial and underwater bridge inspection was successfully conducted on the Delaware Memorial Bridge Twin Spans, using a hybrid unmanned vehicle called the Naviator, which can fly and swim.

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The inspection was a result of a collaborative effort that included the Delaware River Bay Authority (DRBA), Rutgers University-New Brunswick (RU-NB) and SubUAS LLC.

"The ability to have a single autonomous vehicle inspect piers or vessels both above and below the water line is no longer science fiction," **says Thomas J. Cook, executive director of the DRBA**.

Rutgers-New Brunswick School of Engineering Professor F. Javier Diez says, "the Naviator's ability to seamlessly and rapidly transition from flying in the air to maneuvering underwater provides tremendous opportunities for a number of industries and naval operations."

Thanks to funding from the Office of Naval Research (ONR), the Naviator was developed at Rutgers School of Engineering, which is an official FAA UAS testing facility. The Naviator research team is making enhancements to the vehicle so that it can be used not only for bridge inspections, but also for applications such as ocean floor mapping, harbor security, and search and rescue operations, to name a few. http://www.auvsi.org/industry-news/naviator-hybrid-unmanned-vehicle-completes-first-airwater-drone-inspection-high-value

Raleigh-Based Company Leads the Charge to Bring Commercial Drone Services to Businesses Globally JUL 19, 2017 **Matt Hunckler ,**

PrecisionHawk has raised $29 million from Verizon Ventures, Intel Capital, Millennium Technology Value Partners and several other corporate venture capital firms.

PrecisionHawk's hardware and flight software are useful tools for many commercial enterprises , but the analytics software is arguably the most valuable component of its drone system. The algorithm library (sold as a separate subscription) includes many agriculture-related apps as well as

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cross-industry apps for orthomosaic images, 3D modelling and volume measurements, to name a few.

Since its founding in 2011, Precision Hawk has processed over 8 million acres of land, and its customers include global brands like Monsanto, DuPont, Chevron, Verizon, Pepsico and Yamaha. The team is also continuing to work with the FAA and NASA to address traffic management concerns surrounding the integration of drone fleets into the national airspace.

In a recent pitch for PrecisionHawk, Chasen evoked *The Jetsons* as an illustration of the expansive role he believes drones will soon have in our world. If his prediction is correct, then PrecisionHawk could be a key company leading us towards that future.
https://www.forbes.com/sites/matthunckler/2017/07/19/raleigh-based-company-leads-the-charge-to-bring-commercial-drone-services-to-businesses-globally/#1e2ecb8421b1

British Police Use Drones to Track Reckless Bikers

Police departments in the counties of Dorset, Cornwall, and Devon have been using drones to track reckless bikers, and more agencies might follow suit.

BY MARCO MARGARITOFF JULY 18, 2017

Several police departments in England have been using unmanned aerial vehicles (UAVs) to track motorcyclists riding recklessly for quite some time, and now it seems that the town of South Shields is ready to join the departments of Dorset, Cornwall, and Devon in using the airborne tool to catch criminals. According to RideApart, the three departments had a 24-hour setup in place that was used to cover the three counties in search of reckless and endangering bikers.

In the United States, similar implementations have been discussed, but always swatted down by the public. According to RideApart, four years ago the Seattle police department was keen on developing a drone program, but the citizenry wasn't in agreement, inevitably shutting it down. The same thing happened in Los Angeles a short while after. In the U.K., however, the public seems to mind less.

Chief superintendent Jim Nye, the commander of the Devon-Cornwall and Dorset Police Operations Alliance, believes UAVs complement police work extremely well. "Drone capability is a cutting-edge way to support operational policing," Nye said. "This technology offers a highly cost effective

approach in supporting our officers on the ground in operational policing. Drones can even help police track and monitor suspects during a firearm or terrorist incident, as it will allow officers to gain vital information, quickly, safely, and allow us to respond effectively at the scene."
http://www.thedrive.com/aerial/12601/british-police-use-drones-to-track-reckless-bikers

How drones will change our retail experience, our cities and our skies

Posted on July 18, 2017 **in CONNECTED DEVICES, INDUSTRIAL, CATE LAWRENCE**

In a quest to understand the impact of drones on retail services, I spoke to Yariv Bash, co-founder and CEO of full-service drone delivery logistics company Flytrex. Last year, Flytrex successfully rolled out a drone delivery service with **the Ukranian postal service** to deliver goods up to 1kg (2.2 pounds) over 23km (14.3 miles). Flytex's main focus, however, is enterprise customers who not only want to purchase a fleet of drones, but also the accompanying control and monitoring systems.

One of the least-reported benefits of drones is their low carbon footprint. According to Bash, drones can "reduce road congestion in crowded cities and reduce air pollution." It's easy to imagine them replacing small-scale single-item deliveries, including food deliveries.

"One of the great advantages of drones in delivering items is the scale of what they can deliver," Bash said. "Imagine a warehouse full of 200,000 of the most popular items sold in your area. It could include everything from groceries to books and pharmaceuticals and be delivered to shoppers in just 10-15 minutes." https://readwrite.com/2017/07/18/drones-change-retail-experience-cities-sky-il1/

20July17

Army Research Lab Seeks to Build Autonomous Drones, Robots for Electronic Warfare **Scott Nicholas July 19, 2017 Latest News, Tech & Cyber**

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The Army Research Laboratory will fund new projects to develop autonomous drone and robotic technologies intended for electronic warfare operations, Defense One reported Tuesday.

ARL aims to equip autonomous platforms with onboard tools that will work to counter anti-access/area denial systems as part of the *Distributed and Collaborative Intelligent Systems and Technology* program. The laboratory also seeks to leverage discoveries from commercial research on distributed sensors and other connected devices for military use through the *Internet of Battlefield Things* program.

Philip Perconti, ARL director, said the laboratory wants to create battlefield communications and sensing networks to support operations against adversaries that utilize EW systems. Perconti added the laboratory could award contracts under both programs later this year.
http://www.executivegov.com/2017/07/army-research-lab-seeks-to-build-autonomous-drones-robots-for-electronic-warfare/

Air traffic control is not just for planes anymore

With thousands of drones taking to the skies every day, the airspace is bound to get crowded. These companies are working to prevent drone disruptions.

AirMap, based in Santa Monica, California, is a platform for managing drone traffic.

It aggregates data from a variety of sources that encompass traffic, weather, first-responder activity and regulatory restrictions. Information is used by drones like those from DJI and Yuneec to help prevent pilots from flying where they shouldn't. Flights at lower-level altitudes have to consider obstacles like buildings and emergency activity, things that commercial airliners generally don't have to worry about at 30,000 feet.

Before taking off, drone pilots submit a flight plan that's analyzed to tell them about weather conditions or if they are violating any rules in the airspace.

Airports and other airspace managers can also access the data from AirMap and communicate directly with drone pilots who have submitted flight plans and their phone numbers. There are 130 airports in the US, including LAX and Houston's George Bush Intercontinental that are currently using the platform. At the moment the system is totally voluntary and there's no federal

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requirement for drone pilots to register with AirMap. https://www.cnet.com/news/air-traffic-control-is-not-just-for-planes-anymore/

Unmanned Systems Presents Supercam S450 UAV At MAKS July 20, 2017

Izhevsk-based Unmanned Systems is using this year's MAKS show to present a mock-up of its new development, the Supercam S450 unmanned aerial vehicle (UAV). This upgraded version of the Supercam S350 baseline has its **accumulator-powered endurance extended to eight hours** and can carry four kilograms of payload. The developer says the UAV has a maximum airspeed of 120 km/h and a maximum range of 560 km. The radio link has a maximum operational radius of 110 km, and the video channel range is up to 80 km.

The UAV is fitted with a wing detachment mechanism for rough landing situations. The detachable wing simplifies transportation and repairs. The vehicle's possible mission payloads include a remote-controlled HD video camera, a remote-controlled video camera with 720x576 resolution, a thermal imager, as well as assorted photographic cameras and radiation sensors. The payload is installed under the center wing for unobstructed coverage. The Supercam S450 is intended for real-time airborne video surveillance day and night.

This transforming drone can fly like an airplane and spin like a seed

James Vincent@jjvincent Jul 20, 2017

Small drones tend to come in two distinct varieties: the ones with wings, which are best for carrying loads over long distances; and the ones with rotors, which are more agile but less energy efficient. A few drone-makers have tried to combine both flight-modes into a single design, but none have taken the approach of THOR — a new drone from the Singapore University of Technology & Design.

Usually, when aircraft makers want to hover and cruise, they simply fix rotors onto rotating wings, like NASA did with its massive Greased Lightning prototype. But with THOR (it stands for Transformable Hovering Rotorcraft) **the wings *become* rotors, transitioning in mid-air and spinning around a central module like a single-bladed helicopter**. The end-effect makes the craft look like a sycamore or 'helicopter' seed, which use the same design to disperse themselves away from their trees. The drone's creators, who presented their work at the ICRA conference last month, say they were actually inspired by the similar-looking samara seed.

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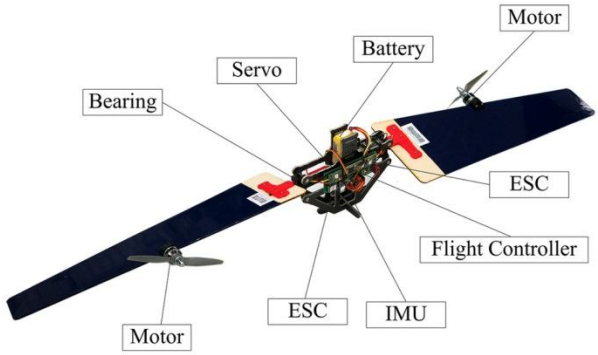

The layout of the THOR drone, showing propellors attached to the wings which are used in cruise mode. *Image credit: Singapore University of Technology & Design*

The drone at rest. *Image credit: Singapore University of Technology & Design via IEEE Spectrum*

The design still needs a bit of work, as transitioning from one mode to the other isn't seamless. But speaking to *IEEE Spectrum*, THOR's creators are confident it can find an edge over current drone designs: "Because [...] it can be made smaller than other hybrid platforms, [it] will unlock many possibilities where current hybrid UAVs are too big or bulky to operate! These include agriculture, surveillance, and package delivery, all of which are hot topics in drone development as of the moment." https://www.theverge.com/circuitbreaker/2017/7/20/16002594/transforming-drone-copter-cruise-spin-thor

21July17

Live Webinar - Safe2Ditch: Automated Crash Management Technology for Small UAVs

Tuesday, July 25, 2017 | 2:00 PM - 3:00 PM ET

Don't forget to register for NASA Langley's free webinar next week featuring Safe2Ditch!

Safe2Ditch is an autonomous, low cost crash management system that enables

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landing to a safe and clear ditch site for small UAVs. The system's exclusive mission is to get a vehicle safely to the ground in the event of an unexpected critical flight issue to minimize the risk of UAVs to people and property. This mission is performed autonomously, without any assistance from a safety pilot or ground station.

During this webinar, inventors Patricia Glaab and Louis Glaab will discuss the technology and its applications.

To register for the webinar, visit:

https://go.nasa.gov/2sI2iqT

To view a short video about the technology, visit:

http://bit.ly/2r5oWJ3

Our Featured Technology for July 2017!

Directional UAV Localization of Power Line Ultraviolet Corona

Improved method of detecting power line faults

NASA's Langley Research Center has developed a novel system that uses an ultra-violet camera to detect, inspect, and analyze a corona discharge. This discharge signifies a power line fault, making the technology ideal for use in power line inspections. When coupled to a drone, the technology offers the ability to remotely monitor power lines in a cost effective way. Adding GPS technology results in precise location of power line faults.

Read more about the applications and benefits of this technology here!

For more information about these or other Langley technologies, please visit: http://technologygateway.nasa.gov

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MIT Researchers Develop Mini-Computer Chips for Mini-Drones

Researchers at MIT are designing smaller, more efficient computer chips to "miniaturize the brain of a drone." MARCO MARGARITOFF JULY 20, 2017

CHRISTINE DANILOFF / MIT SHARE

Researchers at MIT are developing miniature chips, which would require far less power, ridding drones of the hitherto-required battery weight. Smaller chips, less batteries, less weight.

MIT researchers Sertac Karaman and Vivienne Sze claim that this is a wholly "new approach" to minimizing the restrictive need for large batteries and weight. "Imagine buying a bottlecap-sized drone that can integrate with your phone, and you can take it out and fit it in your palm," Karaman says. "If you lift your hand up a little, it would sense that, and start to fly around and film you. Then you open your hand again and it would land on your palm, and you could upload that video to your phone and share it with others," says Karaman.

The research being done at MIT is partly funded by both the National Science Foundation and the Air Force, with their goal, according to Karaman, being to design the "smallest intelligent drone that can fly on its own." Currently, their most successful prototype can process images at 20 frames per second, accurately orient the UAV, and consume less than 2 watts of power. That's a huge leap from the current quadcopter standard of using between 10 and 30 watts of power, never mind their batteries being too heavy to fit on one of these proposed mini-drones. http://www.thedrive.com/aerial/12671/mit-researchers-develop-mini-computer-chips-for-mini-drones

Are Flying Vineyard Drones Creating Better Wine?

Vintners are using aerial drones to improve vines, bottom lines and what ends up in the bottle. But will the art and instinct of winemaking be impacted?

BY MATT ALDERTON

Drones prove useful as wine increasingly embraces sophisticated science, which adds a 21st-century sheen to an age-old craft.

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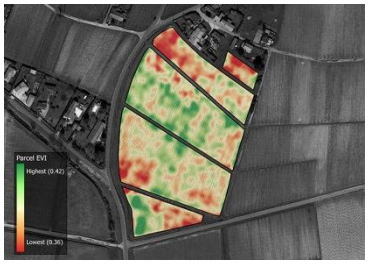
"Plants that have a high level of photosynthetic activity are healthier than plants that have a low level of photosynthetic activity," says Kevin Gould, founder and CEO of Hawk Aerial, which pilots drones for vineyards.

"The drones take photos using multispectral cameras. They then stitch those images together and then the composite image is processed by a proprietary Enhanced Vegetation Index computer algorithm. This colorizes the image which makes vine vigor visible."

"That alerts the vineyard manager and viticulturist to various levels of health or low health in their vineyard," says Gould, who likens "vigor maps" to compasses. Although they don't tell growers the reasons why vines are weak—be it poor irrigation, inadequate fertilization or pests—they point them in the right direction.

"Wine that's made from diseased grapes has an off-flavor, so disease-free grapes offer wine drinkers a better drinking experience," says Melissa Staid Ph.D., co-founder and CFO of VineView, who says plant vigor also impacts taste. "There's an optimum vigor level associated with quality wine, so the extent to which a grower is proactive about managing vigor will result in a much better quality wine."



A drone's map of vineyard EVI levels (Enhanced Vegetation Index), also known as vigor / Photo courtesy SkySquirrel

http://www.winemag.com/2017/07/20/are-flying-vineyard-drones-creating-better-wine/

Anti-drone radio wave startup SkySafe secures $11.5M from Andreessen

Josh Constine (@joshconstine)

Drones are a threat to both military and public safety, whether flown by a terrorist or just a

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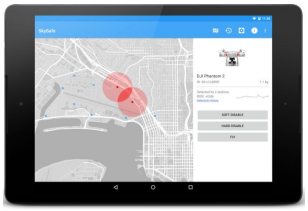
reckless pilot. SkySafe's radio wave technology can detect and stop rogue drones from entering unauthorized areas like military bases, stadiums, prisons and airports. SkySafe's radio frequency signals are projected from a perimeter of nodes or even a Jeep, and force unapproved drones to leave or land while allowing permitted drones to fly.

Now just two years after launch, SkySafe has raised an $11.5 million Series A round led by Andreessen Horowitz, whose partner Lars Dalgaard will join the board. It adds to the $3 million seed led by Andreessen last year.



Meanwhile, SkySafe has secured a $1.5 million Department of Defense contract with Naval Special Warfare to provide counter-drone tech to the Navy Seals. SkySafe's mobile defense vehicle can accompany armed forces in the field to protect a moving perimeter from drone attacks or surveillance. https://techcrunch.com/2017/07/20/skysafe/

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