10June17

Tilt-rotor hexacopter puts a new twist on drone orientation

Loz Blain June 8, 2017

The Voliro hexacopter's tilting rotors let it hover and fly in any orientation (Credit: Voliro)

Multicopter drones are breaking through the final restriction on their movement in the air: they no longer need to hover parallel with the ground. The Voliro prototype's six props can tilt 360 degrees, allowing a staggering 12 degrees of freedom in the air. It's mesmerizing to watch.

Last week we covered a cube shaped drone, whose ability to calculate the trajectory of a thrown ball and catch it mid-air overshadowed its other remarkable capability of flying and hovering in any orientation.

The Voliro has no such party trick as yet, but it's still a real mind bender. Designed and built in nine months, the prototype is a regular-shaped hexacopter, but each of its six props can tilt a full 360 degrees, allowing a staggering 12 degrees of freedom in the air. That means it can manage a stable hover flying sideways, upside down, diagonally or any other way you care to mention.

Its acrobatic capabilities are more or less unlimited, but the Voliro team (a group of 11 "highly motivated" students from ETH Zurich) is more interested in its ability to hug walls. This could be a huge advantage in infrastructure inspection jobs and the like. http://newatlas.com/voliro-hexacopter-drone-orientation/49969/

Recharge station gives SkyX drones potentially unlimited range

Michael Irving June 9, 2017



SkyX's xStation is a recharging platform for the long-range SkyOne UAV (Credit: David Cooper)

Unmanned Aerial Vehicles (UAVs) have found plenty of use in industrial applications, buzzing around

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

to inspect crops, buildings or other structures. That's fine if they're flying around a facility or a farm, but these drones could also be useful for monitoring long-range infrastructure, like railroads or gas pipes, if they weren't limited by battery life. Now SkyX has installed its first xStation, a recharging dock that can be placed periodically along a route to extend the range of its drones almost indefinitely.

The system is designed to work with the company's SkyOne UAV, an autonomous hybrid aircraft that takes off vertically before leveling out into fixed-wing flight. Currently, the SkyOne has a range of about 100 km (62 miles), but in a long-range application like inspecting pipes, it might be effectively only making use of half that distance, before it has to turn around and go home to recharge.

To wring the most out of the SkyOne, the xStation can be installed at specific points along a well-traveled route, to top up the drone as required. When the SkyOne begins to run out of juice, an algorithm helps it find the nearest recharge station. Once there, it touches down onto the platform to charge, while the xStation's clamshell-style roof closes around it to protect the drone from the elements. When it's ready to go again, the drone will perform a complete systems check before continuing on its way. http://newatlas.com/skyx-xstation-uav-recharging-station/49971/

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OA-7 Cygnus "John Glenn" Completes Re-Entry.

NASA Space Flight (6/11) reports that Orbital ATK's OA-7 Cygnus spacecraft "has conducted its final mission event – deorbit and destructive reentry," after its departure from the ISS and completion of the SAFFIRE III experiment and deployment of Cubesats for NanoRacks. The spacecraft re-entered Earth's atmosphere Sunday "over a remote stretch of the Pacific Ocean at around 13:02 EDT."

Workhorse SureFly Holds Promise As Personal Mobility Device.

Wonderful Engineering (6/10) reported on the Workhorse SureFly, a "two-seater flying car" or "electric quadcopter, with two contra-rotating propellers in both corners," which has a range of 70 miles.

The article mentions that Workhorse is different from other companies developing flying personal vehicles because, "unlike most flying cars from early stage startups that we see these days, this one comes from a company with expertise in building range-extended trucks." Moreover, the Workhorse HorseFly UAV Delivery multi-copter flight control system has already been tested by UPS "for routine delivery operations, capable of 30-minute flight while carrying 10-pound packages."

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

http://wonderfulengineering.com/workhorse-two-seater-sports-car-skies/

Arizona Firefighting Operations Temporarily Shut Down Because Of Unauthorized UAS.

The Sierra Vista (AZ) Herald (6/11) reports that firefighters had to shut down all “aerial suppression operations...for four hours” on Thursday “after an unauthorized drone was spotted in the airspace of the Lizard Fire” raging in Arizona, which now stands at “more than 10,500 acres.”

The article also mentions that “drone operators need to be aware that the U.S. Forest Service generally requests Temporary Flight Restriction (TFR) from the Federal Aviation Administration (FAA) on all fires when the Forest Service has an aircraft responding.” http://www.svherald.com/free_access/hobbyists-flying-drones-near-lizard-fire-ignites-danger/article_d2d3c1fa-4e51-11e7-b6dd-1b5288cf00dc.html

13June17

Insitu Awarded $8 Million USMC Contract For RQ-21A Blackjack UAVs.

Sputnik News (6/13) reports that Insitu has been awarded an $8 million contract to supply RQ-21A Blackjack UAVs to the US Marine Corps (USMC).

The Blackjack “can carry day/night full-motion video cameras, infrared markers, laser range finders and communications relay packages.” https://sputniknews.com/military/201706131054571095-boeing-provide-marines-drones/

Commercial drones are the fastest-growing part of the market

Most drones today are either cheap toys or expensive weapons. But interesting commercial uses are emerging in the middle, says Tom Standage

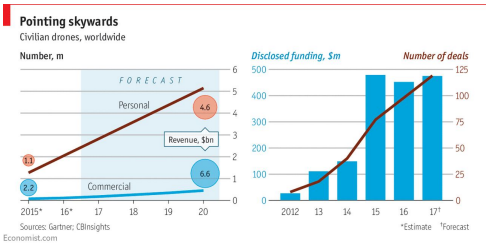
Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

Print edition | Technology Quarterly
Jun 10th 2017

STARTING a riot at a football match. Revealing an unknown monument in the desert near Petra. Performing at the Super Bowl. Sneaking drugs and mobile phones into prisons. Herding elephants in Tanzania. What links this astonishing range of activities? They are all things that have been done by small flying robots, better known as drones.

To most people a drone is one of two very different kinds of pilotless aircraft: a toy or a weapon. It is either a small, insect-like device that can sometimes be seen buzzing around in parks or on beaches, or a large military aircraft that deals death from the skies, allowing operators in Nevada to fire missiles at terrorist suspects in Syria. The first category, recreational drones aimed at consumers, are the more numerous by far; around 2m were sold around the world last year. The second category, military drones, account for the vast majority (nearly 90%) of worldwide spending on drones. But after a pivotal year for the civilian drone industry, an interesting space is now opening up in the middle as drones start to be put to a range of commercial uses.

Last year around 110,000 drones (technically known as unmanned aerial vehicles, or UAVs) were sold for commercial use, according to Gartner, a consultancy. That figure is expected to rise to 174,000 this year and the number of consumer drones to 2.8m. Although unit sales of commercial drones are much smaller, total revenues from them are nearly twice as big as for the consumer kind (see chart).



In “Drones Reporting for Work”, published in 2016, Goldman Sachs, a bank, argued that drones are becoming “powerful business tools”. It predicted that of the total of $100bn likely to be spent on both military and civilian drones between 2016 and 2020, the commercial segment would be the fastest-growing, notably in construction (accounting for $11.2bn), agriculture ($5.9bn), insurance ($1.4bn) and infrastructure inspection ($1.1bn). Oppenheimer, another bank, predicts that the commercial market “will ultimately contribute the majority of UAV industry revenues”.
http://www.economist.com/news/technology-quarterly/21723003-most-drones-today-are-either-cheap-toys-or-expensive-weapons-interesting

Brain scan

Dario Floreano

A pioneer of “evolutionary robotics” borrows drone designs from nature

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

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THE drones that most people are familiar with today are **"very boring",** declares Dario Floreano, head of the Laboratory of Intelligent Systems at the Swiss Federal Institute of Technology in Lausanne. He thinks that drones will come in a much wider range of shapes and sizes in future, and that nature will provide the inspiration needed to make them more agile, safer and more capable. "There is space for an enormous range of morphologies and sensing capabilities," he says, giving a slightly worrying example: vampire bats. As well as flying, they can also walk, jump and even run along the ground. Dr Floreano and his colleagues have built **bat-like drones with folding wings, and locust-like ones that can jump and fly.**

A pioneer in the field of evolutionary robotics, which borrows ideas from nature, Dr Floreano became interested in drones as a result of his work on insect-inspired vision systems. Curved compound "eyes", which (like insect eyes) can "see" in many directions, turn out to be useful in helping a drone sense its surroundings, navigate and avoid obstacles, for example. Dr Floreano's work on fixed-wing drones, with **stabilisation and autopilot systems inspired by the way bees navigate**, was spun off into a startup called SenseFly, now part of Parrot, a French drone company. SenseFly's main product is a black-and-yellow fixed-wing mapping drone called eBee.

At very small scales, fixed-wing and multirotor designs become less efficient, and insect-like drones with flapping wings may make more sense. Tiny drones could be used for virtual tourism, letting remote users "fly" around with the aid of virtual-reality goggles. In short, today's drone designs barely scratch the surface. "There is a huge range of shapes and sizes that we have to explore," says Dr Floreano. "Future drones may look very different." http://www.economist.com/news/technology-quarterly/21723004-pioneer-evolutionary-robotics-borrows-drone-designs-nature-dario-floreano

McAuliffe backs funding for a drone facility in Covington By Laurence Hammack laurence.hammack@roanoke.com 981-3239

A quad race drone makes it way through hoops suspended from trees in the woods during the Flying Circus First Person View Festival on Saturday. Pilots looked through FPV goggles to see from the perspective of their drone as they raced laps through the woods.

A former primary school in Covington would be converted to a drone research and recreational facility with the help of federal funding backed by Virginia Gov. Terry McAuliffe. McAuliffe announced Monday that he is recommending $100,000 in Appalachian Regional Commission funds that would go toward a project called the Alleghany Highlands Drone Zone. A final decision rests with the commission.

Located in the former Edgemont Primary School, the facility would serve as a regional incubator for an industry in which small, unmanned aircraft will be used to deliver packages, take photographs, conduct surveillance from the air and assist in search and rescue missions. “The long-term goal is to diversify the economy and have an emerging industry that loves rural areas for flying,” said Marla Akridge, executive director of the Alleghany Highlands Economic Development Corp. http://www.roanoke.com/news/virginia/mcauliffe-backs-funding-for-a-drone-facility-in-covington/article_e9267df7-c841-5e1b-ba65-4f3951966181.htm l

Eyes on the storm

How to keep tabs on Atlantic hurricanes

An array of sensors stretches from space to the deep ocean

Advances in automated sensors, both those that fly and those that swim, are making it possible to gather more data from both of these places. This season, for example, will be the first in which a constellation of microsatellites called CYGNSS (Cyclone Global Navigation Satellite System) watches storms as they roll in towards the east coast. The eight-satellite swarm, which was launched in December, listens for radio signals that come from GPS satellites directly above it in space, and for the same signals when they have been reflected from the ocean’s surface beneath the hurricane being studied. Differences between the reflected signal and the original are a consequence of the state of that surface, and CYGNSS can use them to infer wind conditions there.

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

Satellite measurements like this are useful, but it also helps to get as close as possible to the hidden bottom kilometre of a storm. NOAA is doing this with drones called Coyotes, built by Raytheon, an aerospace company. Coyotes are released from tubes in the bellies of NOAA's research planes, then piloted remotely in order to gather data from the region in a storm that is just above the ocean's surface. The data the drones collect complement those from dropsondes, which are sensors that are pushed out of the same tubes and plunge down through a storm like bombs, transmitting as they go.

http://www.economist.com/news/science-and-technology/21723092-array-sensors-stretches-space-deep-ocean-how-keep-tabs

Commercial Drone Completes 30-Mile BVLOS Flight via 3G 09 Jun 2017

Delair-Tech and electrical services company RTE have announced that they have set a new distance record by flying a civilian drone 30 miles (50 kilometers) beyond visual line of sight (BVLOS). The official purpose of the flight, which took place in France, was to inspect RTE's power lines by remote camera as well as to record data that would allow it to build models of its European power grid.

Delair-Tech used for the first time a 3G communication network to guide the drone. Two pilots were used for takeoff and two for the landing phase. The flight was performed on autopilot with GPS data integrated within the drone. To enable this experimental BVLOS flight, the Directorate General of Civil Aviation (DGCA) granted the companies the right to use a specific flight corridor and defined a clear regulatory framework. http://www.unmannedsystemstechnology.com/2017/06/commercial-drone-completes-30-mile-bvlos-flight-via-3g/

Wirth Research Unveils New VTOL Hydrogen-Powered UAS 08 Jun 2017

Wirth Research has announced the release of more details and the first images of its new tilt rotor, Vertical Take Off and Landing (VTOL), hydrogen fuel cell powered terrain mapping drone.

Wirth's Unmanned Aerial System (UAS) will be VTOL-capable for its long-endurance missions, carrying its primary mission payload of a sophisticated suite of terrain-mapping sensors and on-board data processing capabilities. To allow the longest possible endurance with zero in-flight emissions and reduced vibrations, the UAS will be powered by an advanced hybrid power system, featuring a hydrogen fuel cell as its primary energy source. The complete hydrogen fuel cell storage, control and

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

power system will be provided by HES of Singapore, a specialist in ultra-light hydrogen fuel cells.

The key advantage of the Wirth Research UAS is the combination of its VTOL capability, allowing it to take off and land in very restricted terrain, and its ultra long endurance. These capabilities, and the variety of payloads it can carry, mean that this UAS has applications in a wide variety of sectors. These range from precision agriculture, to pipeline and cable inspection for utilities, surveillance and other security-related tasks, through to detection and monitoring support for ordnance clearance operations.

It has been extremely challenging for Wirth Research to meet the requirements of VTOL capability, 6 hour mission endurance, packaging a bulky payload mass and providing that payload with hundreds of watts of continuous electrical power. http://www.unmannedsystemstechnology.com/2017/06/wirth-research-unveils-new-vtol-hydrogen-powered-uas/

NASA and Partners Test Next Phase of UAS Traffic Management System 07 Jun 2017

The Nevada Institute for Autonomous Systems (NIAS) has announced that, along with its NASA partners, it has flown five different Unmanned Aerial Vehicles (UAVs) demonstrating multiple operational scenarios, including parachute initiated emergency supply deliveries and aerial survey operations, at the the FAA-designated Nevada UAS Test Site. In addition to flying the specific NASA Unmanned Aircraft System (UAS) Traffic Management (UTM) missions, the UAVs were flown beyond the pilot's visual line of sight. This was accomplished using strategically placed visual observers (VO) and sophisticated Command and control (C2), communication, detect, and avoid technologies. http://www.unmannedsystemstechnology.com/2017/06/nasa-partners-test-next-phase-uas-traffic-management-system/

GE begins testing drones to inspect refineries, factories

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

The logo of General Electric Co. is pictured at the Global Operations Center in San Pedro Garza Garcia, neighbouring Monterrey, Mexico, May 12, 2017. REUTERS/Daniel Becerril

By Alwyn Scott | SEATTLE

General Electric Co has begun testing autonomous drones and robotic "crawlers" to inspect refineries, factories, railroads and other industrial equipment with an eye on capturing a bigger slice of the $40 billion companies around the globe spend annually on inspections.

In trials with customers, aerial drones and robots are able to move around and inside remote or dangerous facilities while photographing corrosion or taking temperature, vibration or gas readings that can be analyzed by computer algorithms and artificial intelligence, Alex Tepper, head of business development at Avitas Systems, a startup GE formed for this business, told Reuters.

GE is expected to announce the new business, which is focused on the oil and gas, transportation and power sectors, as early as Tuesday at a conference in Berlin, Germany.
https://www.reuters.com/article/us-ge-drones-idUSKBN1940I3

14June17

Can drones deliver the goods?

Why the wait for delivery drones may be longer than expected. *Carrying cargo is a lot more complicated than carrying a camera*

Print edition | Technology Quarterly Jun 10th 2017

THERE is a striking disparity between the commercial applications drone companies are pursuing in fields like construction, inspection or agriculture and the public perception of commercial drones. Media coverage is dominated by one particular application: delivery. Experimental deliveries of parcels, pizzas and other items conjure up visions of skies abuzz with drones ferrying packages to and fro. But although delivery and logistics companies are interested in drones, many drone companies are not interested in deliveries.

The technology giant most closely associated with delivery drones is Amazon. When its boss, Jeff Bezos, revealed his plans for drones in December 2013 on “60 Minutes”, an American television programme, they were widely assumed to be a publicity stunt. But Amazon is quite serious: it carried out its first trial delivery to a customer near Cambridge, England, last December—“13 minutes from click to delivery,” says Gur Kimchi, the head of Amazon’s drone effort.

Deliveries are just one of the proposed uses of drones that seem speculative or impractical now but may become significant in future. Facebook, like Google and Amazon, is also investing in drones, but not for delivery: instead its drone, called Aquila, is a huge solar-powered machine intended as a communications relay, to extend internet access to parts of the world that lack connectivity.

High-altitude drones have also been proposed as a way to generate electricity, because strong winds blow more reliably well above the ground. Known as wind drones or energy kites, such drones are tethered so that cables can deliver the electricity back to the ground.

At the lowest end of the spectrum are insect-like drones, just a few centimetres across, that could be used for surveillance inside buildings, search and rescue, or even pollinating plants.

It is a big leap from today’s drones to these sorts of uses. Trying to imagine how drones will evolve, and the uses to which they will be put, is a bit like trying to forecast the evolution of computing in the 1960s or mobile phones in the 1980s. Their potential as business tools was clear at the time, but the technology developed in unexpected ways. The same will surely be true of drones.
http://www.economist.com/news/technology-quarterly/21723002-carrying-cargo-lot-more-complicated-carrying-camera-why-wait

Study: UAVs Could Carry Heart Defibrillators To Cardiac Arrest Victims.

The AP (6/13) reports that “drones carrying heart defibrillators” may be able to “help bystanders revive people stricken by cardiac arrest,” according to a research letter published in the Journal of the American Medical Association.


Drones carrying automated external defibrillators got to the sites of previous cardiac arrest cases faster than ambulances had, according to test runs conducted by Swedish researchers.*Andreas Claesson/Courtesy of FlyPulse*

Researchers found that UAVs could deliver the devices “within about 5 minutes of launch” to the scenes of 18 cardiac arrests, which was 17 minutes faster than the average time it took ambulances to arrive. Also covering the story are Reuters (6/13), CBS News (6/13) website, and NPR (6/13)

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

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Richard Branson's Newest Company Is in the Middle of a Billion-Dollar Space Race *Staff writer, Inc.*@wheresKR

Sir Richard Branson poses alongside Charlie Graham to celebrate Virgin Money's Birthday in Australia on July 7, 2011 in Sydney, Australia.

Richard Branson has his eye on the skies--again.

The entrepreneur's newest venture, Virgin Orbit, launched in March with the goal of launching mini-satellites into space. Now, the Long Beach, Calif.-based venture is moving closer to launching these satellite companies beyond Earth's atmosphere. According to Quartz, the company already has partnerships with several startups and is looking to make its first flights next year.

One of Orbit's clients, Planet Labs, currently has about 150 satellites--the largest fleet of image-taking satellites in history, Planet says--floating above earth. The San Francisco-based company previously told *Inc*. that when the satellites are all online later this year, they'll be capable of collectively photographing the entire surface of the earth in a 24-hour period.

Another client, Virginia-based OneWeb, is looking to launch hundreds of internet-beaming satellites sometime next year.

Virgin Orbit is specifically targeting as customers the mini-satellite companies that have begun springing up in recent years. While traditional satellites can be about the size of a bus, new technological advances. Instead of using a large rocket capable of launching a traditional satellite, Orbit will equip a 747 jet with a rocket attached underneath its wing. The jet will fly to high altitudes, then fire off the rocket with the package of satellites enclosed. https://www.inc.com/kevin-j-ryan/richard-branson-virgin-orbit-billion-dollar-space-race.html

FAA Investigating UAV Sighting Near Charlotte Douglas Runway.

The Charlotte (NC) Observer (6/14) reports that the FAA said that “the crew of PSA Airlines flight 5123...reported seeing a drone about 1.5 miles from Charlotte Douglas International Airport as the plane prepared to land Friday afternoon.”

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

The FAA is investigating the incident.
http://www.charlotteobserver.com/news/local/article156057004.html

Drone technology has made huge strides

Originally a military technology, drones are now benefiting from rapid advances in consumer electronics

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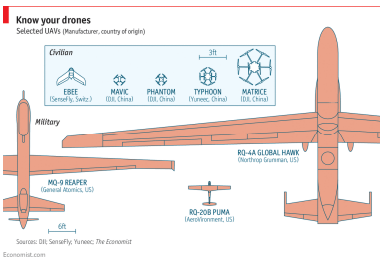
THE first drones were military. The use of pilotless flying machines as weapons dates back to the siege of Venice in 1849, when Austrian forces launched balloons laden with explosives against the city. But the origin of military drones is usually dated to the development of uncrewed, remote-controlled aircraft for use as targets by anti-aircraft gunners after the first world war. The first truly successful example was the de Havilland DH82B Queen Bee, which entered service in Britain in 1935 and seems to have been the inspiration for calling such aircraft “drones” (after stingless male bees); Germany’s V-1 flying bomb was another early drone.

At one end of the spectrum are small, hand-launched fixed-wing surveillance drones such as the Raven, Wasp and Puma, all made by AeroVironment, which fly either autonomously or under short-range remote control. The Raven, used by many countries’ armed forces, is the world’s most widely used military UAV, with around 20,000 units deployed; it can fly for up to 90 minutes. Larger drones like the Predator and Reaper can typically stay aloft for 12-20 hours and carry weapons. Biggest of all are long-endurance, high-altitude reconnaissance drones such as the Northrop Grumman Global Hawk, which can loiter over an area for 32 hours, longer than any human pilot.

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com



Perhaps surprisingly, the recent rise of consumer drones owes little to military systems. Instead, it springs from two completely different technologies: hobbyists' radio-controlled (RC) aircraft on the one hand and smartphones on the other. Many people working in the drone industry started out flying small RC aircraft powered by tiny petrol engines, which were "annoying, messy and super-finicky", says Adam Bry of Skydio. The combination of brushless electric motors and lithium-polymer batteries, used in laptops and smartphones, allowed RC aircraft to be electrically powered, making them lighter, quieter and more reliable.

Military and consumer drones alike are being transformed by rapid progress in two cutting-edge areas of drone research: autonomy and swarming. If you automate away the need for a skilled operator, drones suddenly become much more useful. Military ones that do not require the oversight of a human operator can be radio silent and stealthier. Consumer ones can follow runners, skiers or cyclists and film them from above. Commercial ones can fly a specific, pre-planned path over a field, building site or quarry, avoiding obstacles as they gather data. Improved flight-control algorithms, more on-board processing power and progress in machine vision will allow drones to handle more decisions themselves, rather than relying on fallible or inexpert humans. Most existing drones simply move the pilot from the vehicle to the ground. The next generation of drones will not need pilots at all–just orders. http://www.economist.com/news/technology-quarterly/21723001-originally-military-technology-drones-are-now-benefiting-rapid-advances

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The future of drones depends on regulation, not just technology

Engineers and regulators will have to work together to ensure safety as drones take to the sky

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MOVING bits around the internet is one thing; moving atoms around in the real world is something else entirely. In the two decades of the internet era, many world-changing technologies—web-publishing, file-sharing, online auctions, internet telephony, virtual currencies, ride-hailing—have

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

raised new legal and regulatory questions. In each case, regulators had to work out the rules after the event: figuring out how libel law applies to the web, banning the sale of Nazi memorabilia, deciding whether Bitcoin is a currency, determining whether Uber drivers are employees or contractors, and so on. But drones are a different matter, because of the danger that flying robots pose to life and limb, and the existence of strict rules that govern the use of physical airspace. Their future will depend as much on decisions made by regulators as it does on technological advances. How will it play out?

It is clear that the complexities of operating drones in large numbers have barely begun to be understood. As the first widely deployed mobile robots, drones already offer many exciting possibilities today, and no doubt other, as yet undreamed-of uses will follow in the future. Frank Wang, the founder of DJI, pictures people being followed around by tiny personal drones, like fairy sidekicks. Astro Teller of Google foresees delivery drones that can come up with any item on demand. And passenger drones might some day act as magic carpets, whisking people across cities from rooftop to rooftop.

Drones make the extraordinary power of digital technologies physically incarnate. But because they operate in the physical rather than the virtual world, exploiting the many opportunities they offer will depend just as much on sensible regulation as on technological progress.
http://www.economist.com/news/technology-quarterly/21723000-engineers-and-regulators-will-have-work-together-ensure-safety-drones-take

Sky mail: delivered in Japan

Regulators will unveil plans for parcel deliveries by drone today, paving the way for possible nationwide services by 2020. The government wants to cut regulations and pep up investment in unmanned-aerial-vehicle technology to help solve a profound labour crunch; Japan's working population has shrunk by 10m since the mid-1990s. Delivery companies have been hit harder than most. Yamato, which runs Japan's busiest door-to-door service, has slashed parcel volumes and hiked basic charges for the first time in 27 years. Thousands of other service companies may soon be forced to follow suit. Many are banking on the drone industry to take off. In March, Rakuten, Japan's largest e-commerce firm, announced a joint venture with AirMap, the world's top provider of air-traffic-management software for drones. The goal, they say, is to build a platform for airspace services and "let innovation take flight". https://mail.google.com/mail/u/1/#inbox/15c8c5c8ee7e2256

Chinese E-commerce Giant JD.com Develops UAVs For Rural Deliveries.

CNBC (6/8) reports that Chinese "e-commerce giant" JD.com has developed a UAV "which can deliver packages weighing as much as one ton."

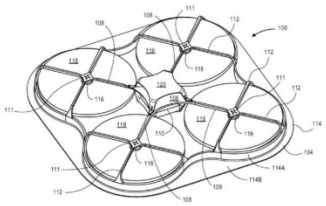
CTO Chen Zhang said that in China, "e-commerce is huge but in remote villages most people are not

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

benefitting from e-commerce," and that the company is developing six different types of delivery UAVs to address that problem, although the high cost of batteries "is a major issue we need to address" before the program can be operationalized. http://www.cnbc.com/2017/06/08/e-commerce-jdcom-alibaba-amazon-drone-delivery-china-asia-technology.html

Amazon Developing "Virtual Safety Shroud" For UAVs.

GeekWire (6/8) reports that Amazon is developing a "virtual safety shroud" for UAVs, in case "a child or a dog wanders into range while a UAV is dipping down to make a delivery," or similar obstructions occur. The "detect-and-avoid system is described in a patent application published today.



Among the inventors is Gur Kimchi, the vice president and co-founder of Amazon Prime Air's drone delivery operation, so you know it's serious." https://www.geekwire.com/2016/amazon-patent-filing-delivery-drone-designs/

Commercial UAV Industry Sees Expanded Opportunities For Use.

The Economist (6/9) reports on the proliferation of commercial UAVs, noting five key areas where there are opportunities for expansion: photography, agriculture, construction, inspection, and public safety.

Regarding agricultural applications, the article notes that "agriculture, and measuring the health of crops in particular, was identified early on as a promising market for commercial drones," as "crop health can be assessed by taking pictures using special multispectral cameras which 'see' more than the human eye." http://www.economist.com/news/technology-quarterly/21722999-todays-drones-are-mostly-flying-cameras-they-are-already-being-put-wide-range

New Bill Would Shift UAS Regulation To State And Local Governments.

Flying Magazine (6/6) reports that Sen. Dianne Feinstein (D-CA) has introduced a bill that would allow "state, local, and Native American tribal authorities to regulate how hobbyists and businesses can operate their drones below 200 feet and within 200 feet of a structure, with the option to seek assistance from the FAA." Feinstein said in a statement that "state local, and tribal governments have

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

a legitimate interest in protecting public safety and privacy from the misuse of drones" and that this bill will provide them with the ability to "create low-altitude speed limits, local no-drone zones or rules that are appropriate to their own circumstances."
10June17

Tilt-rotor hexacopter puts a new twist on drone orientation

Loz Blain June 8, 2017

The Voliro hexacopter's tilting rotors let it hover and fly in any orientation (Credit: Voliro)

Multicopter drones are breaking through the final restriction on their movement in the air: they no longer need to hover parallel with the ground. The Voliro prototype's six props can tilt 360 degrees, allowing a staggering 12 degrees of freedom in the air. It's mesmerizing to watch.

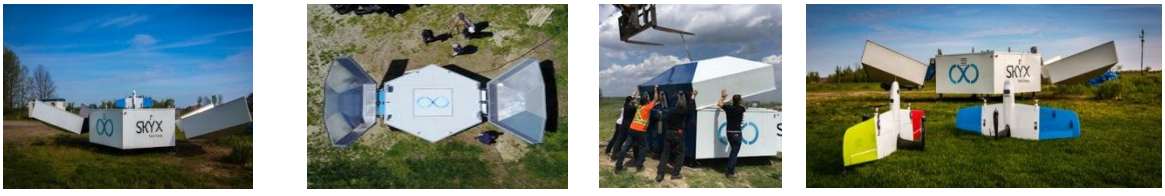
Last week we covered a cube shaped drone, whose ability to calculate the trajectory of a thrown ball and catch it mid-air overshadowed its other remarkable capability of flying and hovering in any orientation.

The Voliro has no such party trick as yet, but it's still a real mind bender. Designed and built in nine months, the prototype is a regular-shaped hexacopter, but each of its six props can tilt a full 360 degrees, allowing a staggering 12 degrees of freedom in the air. That means it can manage a stable hover flying sideways, upside down, diagonally or any other way you care to mention.

Its acrobatic capabilities are more or less unlimited, but the Voliro team (a group of 11 "highly motivated" students from ETH Zurich) is more interested in its ability to hug walls. This could be a huge advantage in infrastructure inspection jobs and the like. http://newatlas.com/voliro-hexacopter-drone-orientation/49969/

Recharge station gives SkyX drones potentially unlimited range

Michael Irving June 9, 2017



SkyX's xStation is a recharging platform for the long-range SkyOne UAV (Credit: David Cooper)

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

Unmanned Aerial Vehicles (UAVs) have found plenty of use in industrial applications, buzzing around to inspect crops, buildings or other structures. That's fine if they're flying around a facility or a farm, but these drones could also be useful for monitoring long-range infrastructure, like railroads or gas pipes, if they weren't limited by battery life. Now SkyX has installed its first xStation, a recharging dock that can be placed periodically along a route to extend the range of its drones almost indefinitely.

The system is designed to work with the company's SkyOne UAV, an autonomous hybrid aircraft that takes off vertically before leveling out into fixed-wing flight. Currently, the SkyOne has a range of about 100 km (62 miles), but in a long-range application like inspecting pipes, it might be effectively only making use of half that distance, before it has to turn around and go home to recharge.

To wring the most out of the SkyOne, the xStation can be installed at specific points along a well-traveled route, to top up the drone as required. When the SkyOne begins to run out of juice, an algorithm helps it find the nearest recharge station. Once there, it touches down onto the platform to charge, while the xStation's clamshell-style roof closes around it to protect the drone from the elements. When it's ready to go again, the drone will perform a complete systems check before continuing on its way. http://newatlas.com/skyx-xstation-uav-recharging-station/49971/

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OA-7 Cygnus “John Glenn” Completes Re-Entry.

NASA Space Flight (6/11) reports that Orbital ATK’s OA-7 Cygnus spacecraft “has conducted its final mission event – deorbit and destructive reentry,” after its departure from the ISS and completion of the SAFFIRE III experiment and deployment of Cubesats for NanoRacks. The spacecraft re-entered Earth’s atmosphere Sunday “over a remote stretch of the Pacific Ocean at around 13:02 EDT.”

Workhorse SureFly Holds Promise As Personal Mobility Device.

Wonderful Engineering (6/10) reported on the Workhorse SureFly, a “two-seater flying car” or “electric quadcopter, with two contra-rotating propellers in both corners,” which has a range of 70 miles.

The article mentions that Workhorse is different from other companies developing flying personal vehicles because, “unlike most flying cars from early stage startups that we see these days, this one comes from a company with expertise in building range-extended trucks.” Moreover, the Workhorse HorseFly UAV Delivery multi-copter flight control system has already been tested by UPS “for routine delivery operations, capable of 30-minute flight while carrying 10-pound packages.”

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

http://wonderfulengineering.com/workhorse-two-seater-sports-car-skies/

Arizona Firefighting Operations Temporarily Shut Down Because Of Unauthorized UAS.

The Sierra Vista (AZ) Herald (6/11) reports that firefighters had to shut down all “aerial suppression operations...for four hours” on Thursday “after an unauthorized drone was spotted in the airspace of the Lizard Fire” raging in Arizona, which now stands at “more than 10,500 acres.”

The article also mentions that “drone operators need to be aware that the U.S. Forest Service generally requests Temporary Flight Restriction (TFR) from the Federal Aviation Administration (FAA) on all fires when the Forest Service has an aircraft responding.” http://www.svherald.com/free_access/hobbyists-flying-drones-near-lizard-fire-ignites-danger/article_d2d3c1fa-4e51-11e7-b6dd-1b5288cf00dc.html

13June17

Insitu Awarded $8 Million USMC Contract For RQ-21A Blackjack UAVs.

Sputnik News (6/13) reports that Insitu has been awarded an $8 million contract to supply RQ-21A Blackjack UAVs to the US Marine Corps (USMC).

The Blackjack “can carry day/night full-motion video cameras, infrared markers, laser range finders and communications relay packages.” https://sputniknews.com/military/201706131054571095-boeing-provide-marines-drones/

Commercial drones are the fastest-growing part of the market

Most drones today are either cheap toys or expensive weapons. But interesting commercial uses are emerging in the middle, says Tom Standage

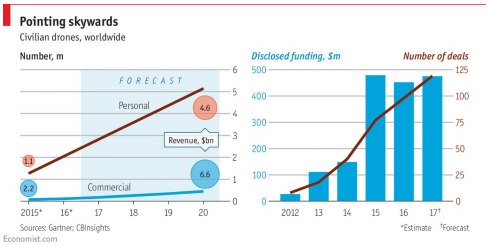
Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

Print edition | Technology Quarterly
Jun 10th 2017

STARTING a riot at a football match. Revealing an unknown monument in the desert near Petra. Performing at the Super Bowl. Sneaking drugs and mobile phones into prisons. Herding elephants in Tanzania. What links this astonishing range of activities? They are all things that have been done by small flying robots, better known as drones.

To most people a drone is one of two very different kinds of pilotless aircraft: a toy or a weapon. It is either a small, insect-like device that can sometimes be seen buzzing around in parks or on beaches, or a large military aircraft that deals death from the skies, allowing operators in Nevada to fire missiles at terrorist suspects in Syria. The first category, recreational drones aimed at consumers, are the more numerous by far; around 2m were sold around the world last year. The second category, military drones, account for the vast majority (nearly 90%) of worldwide spending on drones. But after a pivotal year for the civilian drone industry, an interesting space is now opening up in the middle as drones start to be put to a range of commercial uses.

Last year around 110,000 drones (technically known as unmanned aerial vehicles, or UAVs) were sold for commercial use, according to Gartner, a consultancy. That figure is expected to rise to 174,000 this year and the number of consumer drones to 2.8m. Although unit sales of commercial drones are much smaller, total revenues from them are nearly twice as big as for the consumer kind (see chart).



In “Drones Reporting for Work”, published in 2016, Goldman Sachs, a bank, argued that drones are becoming “powerful business tools”. It predicted that of the total of $100bn likely to be spent on both military and civilian drones between 2016 and 2020, the commercial segment would be the fastest-growing, notably in construction (accounting for $11.2bn), agriculture ($5.9bn), insurance ($1.4bn) and infrastructure inspection ($1.1bn). Oppenheimer, another bank, predicts that the commercial market “will ultimately contribute the majority of UAV industry revenues”.
http://www.economist.com/news/technology-quarterly/21723003-most-drones-today-are-either-cheap-toys-or-expensive-weapons-interesting

Brain scan

Dario Floreano

A pioneer of “evolutionary robotics” borrows drone designs from nature

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

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THE drones that most people are familiar with today are “very boring”, declares Dario Floreano, head of the Laboratory of Intelligent Systems at the Swiss Federal Institute of Technology in Lausanne. He thinks that drones will come in a much wider range of shapes and sizes in future, and that nature will provide the inspiration needed to make them more agile, safer and more capable. “There is space for an enormous range of morphologies and sensing capabilities,” he says, giving a slightly worrying example: vampire bats. As well as flying, they can also walk, jump and even run along the ground. Dr Floreano and his colleagues have built bat-like drones with folding wings, and locust-like ones that can jump and fly.

A pioneer in the field of evolutionary robotics, which borrows ideas from nature, Dr Floreano became interested in drones as a result of his work on insect-inspired vision systems. Curved compound “eyes”, which (like insect eyes) can “see” in many directions, turn out to be useful in helping a drone sense its surroundings, navigate and avoid obstacles, for example. Dr Floreano’s work on fixed-wing drones, with stabilisation and autopilot systems inspired by the way bees navigate, was spun off into a startup called SenseFly, now part of Parrot, a French drone company. SenseFly’s main product is a black-and-yellow fixed-wing mapping drone called eBee.

At very small scales, fixed-wing and multirotor designs become less efficient, and insect-like drones with flapping wings may make more sense. Tiny drones could be used for virtual tourism, letting remote users “fly” around with the aid of virtual-reality goggles. In short, today’s drone designs barely scratch the surface. “There is a huge range of shapes and sizes that we have to explore,” says Dr Floreano. “Future drones may look very different.” http://www.economist.com/news/technology-quarterly/21723004-pioneer-evolutionary-robotics-borrows-drone-designs-nature-dario-floreano

McAuliffe backs funding for a drone facility in Covington By Laurence Hammack laurence.hammack@roanoke.com 981-3239

A quad race drone makes it way through hoops suspended from trees in the woods during the Flying Circus First Person View Festival on Saturday. Pilots looked through FPV goggles to see from the perspective of their drone as they raced laps through the woods.

A former primary school in Covington would be converted to a drone research and recreational facility with the help of federal funding backed by Virginia Gov. Terry McAuliffe. McAuliffe announced Monday that he is recommending $100,000 in Appalachian Regional Commission funds that would go toward a project called the Alleghany Highlands Drone Zone. A final decision rests with the commission.

Located in the former Edgemont Primary School, the facility would serve as a regional incubator for an industry in which small, unmanned aircraft will be used to deliver packages, take photographs, conduct surveillance from the air and assist in search and rescue missions. “The long-term goal is to diversify the economy and have an emerging industry that loves rural areas for flying,” said Marla Akridge, executive director of the Alleghany Highlands Economic Development Corp.
http://www.roanoke.com/news/virginia/mcauliffe-backs-funding-for-a-drone-facility-in-covington/article_e9267df7-c841-5e1b-ba65-4f3951966181.htm l

Eyes on the storm

How to keep tabs on Atlantic hurricanes

An array of sensors stretches from space to the deep ocean

Advances in automated sensors, both those that fly and those that swim, are making it possible to gather more data from both of these places. This season, for example, will be the first in which a constellation of microsatellites called CYGNSS (Cyclone Global Navigation Satellite System) watches storms as they roll in towards the east coast. The eight-satellite swarm, which was launched in December, listens for radio signals that come from GPS satellites directly above it in space, and for the same signals when they have been reflected from the ocean’s surface beneath the hurricane being studied. Differences between the reflected signal and the original are a consequence of the state of that surface, and CYGNSS can use them to infer wind conditions there.

Satellite measurements like this are useful, but it also helps to get as close as possible to the hidden bottom kilometre of a storm. NOAA is doing this with drones called Coyotes, built by Raytheon, an aerospace company. Coyotes are released from tubes in the bellies of NOAA’s research planes, then piloted remotely in order to gather data from the region in a storm that is just above the ocean’s surface. The data the drones collect complement those from dropsondes, which are sensors that are pushed out of the same tubes and plunge down through a storm like bombs, transmitting as they go.

http://www.economist.com/news/science-and-technology/21723092-array-sensors-stretches-space-deep-ocean-how-keep-tabs

Commercial Drone Completes 30-Mile BVLOS Flight via 3G 09 Jun 2017

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

Delair-Tech and electrical services company RTE have announced that they have set a new distance record by flying a civilian drone 30 miles (50 kilometers) beyond visual line of sight (BVLOS). The official purpose of the flight, which took place in France, was to inspect RTE's power lines by remote camera as well as to record data that would allow it to build models of its European power grid.

Delair-Tech used for the first time a 3G communication network to guide the drone. Two pilots were used for takeoff and two for the landing phase. The flight was performed on autopilot with GPS data integrated within the drone. To enable this experimental BVLOS flight, the Directorate General of Civil Aviation (DGCA) granted the companies the right to use a specific flight corridor and defined a clear regulatory framework. http://www.unmannedsystemstechnology.com/2017/06/commercial-drone-completes-30-mile-bvlos-flight-via-3g/

Wirth Research Unveils New VTOL Hydrogen-Powered UAS 08 Jun 2017

Wirth Research has announced the release of more details and the first images of its new tilt rotor, Vertical Take Off and Landing (VTOL), hydrogen fuel cell powered terrain mapping drone.

Wirth's Unmanned Aerial System (UAS) will be VTOL-capable for its long-endurance missions, carrying its primary mission payload of a sophisticated suite of terrain-mapping sensors and on-board data processing capabilities. To allow the longest possible endurance with zero in-flight emissions and reduced vibrations, the UAS will be powered by an advanced hybrid power system, featuring a hydrogen fuel cell as its primary energy source. The complete hydrogen fuel cell storage, control and power system will be provided by HES of Singapore, a specialist in ultra-light hydrogen fuel cells.

The key advantage of the Wirth Research UAS is the combination of its VTOL capability, allowing it to take off and land in very restricted terrain, and its ultra long endurance. These capabilities, and the variety of payloads it can carry, mean that this UAS has applications in a wide variety of sectors. These range from precision agriculture, to pipeline and cable inspection for utilities, surveillance and other security-related tasks, through to detection and monitoring support for ordnance clearance operations.

It has been extremely challenging for Wirth Research to meet the requirements of VTOL capability, 6 hour mission endurance, packaging a bulky payload mass and providing that payload with hundreds of watts of continuous electrical power. http://www.unmannedsystemstechnology.com/2017/06/wirth-

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

research-unveils-new-vtol-hydrogen-powered-uas/

NASA and Partners Test Next Phase of UAS Traffic Management System 07 Jun 2017

The Nevada Institute for Autonomous Systems (NIAS) has announced that, along with its NASA partners, it has flown five different Unmanned Aerial Vehicles (UAVs) demonstrating multiple operational scenarios, including parachute initiated emergency supply deliveries and aerial survey operations, at the the FAA-designated Nevada UAS Test Site. In addition to flying the specific NASA Unmanned Aircraft System (UAS) Traffic Management (UTM) missions, the UAVs were flown beyond the pilot's visual line of sight. This was accomplished using strategically placed visual observers (VO) and sophisticated Command and control (C2), communication, detect, and avoid technologies. http://www.unmannedsystemstechnology.com/2017/06/nasa-partners-test-next-phase-uas-traffic-management-system/

GE begins testing drones to inspect refineries, factories

The logo of General Electric Co. is pictured at the Global Operations Center in San Pedro Garza Garcia, neighbouring Monterrey, Mexico, May 12, 2017. REUTERS/Daniel Becerril

By Alwyn Scott | SEATTLE

General Electric Co has begun testing autonomous drones and robotic "crawlers" to inspect refineries, factories, railroads and other industrial equipment with an eye on capturing a bigger slice of the $40 billion companies around the globe spend annually on inspections.

In trials with customers, aerial drones and robots are able to move around and inside remote or dangerous facilities while photographing corrosion or taking temperature, vibration or gas readings that can be analyzed by computer algorithms and artificial intelligence, Alex Tepper, head of business development at Avitas Systems, a startup GE formed for this business, told Reuters.

GE is expected to announce the new business, which is focused on the oil and gas, transportation and

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

power sectors, as early as Tuesday at a conference in Berlin, Germany.
https://www.reuters.com/article/us-ge-drones-idUSKBN1940I3

14June17

Can drones deliver the goods?

Why the wait for delivery drones may be longer than expected. *Carrying cargo is a lot more complicated than carrying a camera*

Print edition | Technology Quarterly Jun 10th 2017

THERE is a striking disparity between the commercial applications drone companies are pursuing in fields like construction, inspection or agriculture and the public perception of commercial drones. Media coverage is dominated by one particular application: delivery. Experimental deliveries of parcels, pizzas and other items conjure up visions of skies abuzz with drones ferrying packages to and fro. But although delivery and logistics companies are interested in drones, many drone companies are not interested in deliveries.

The technology giant most closely associated with delivery drones is Amazon. When its boss, Jeff Bezos, revealed his plans for drones in December 2013 on “60 Minutes”, an American television programme, they were widely assumed to be a publicity stunt. But Amazon is quite serious: it carried out its first trial delivery to a customer near Cambridge, England, last December—“13 minutes from click to delivery,” says Gur Kimchi, the head of Amazon’s drone effort.

Deliveries are just one of the proposed uses of drones that seem speculative or impractical now but may become significant in future. Facebook, like Google and Amazon, is also investing in drones, but not for delivery: instead its drone, called Aquila, is a huge solar-powered machine intended as a communications relay, to extend internet access to parts of the world that lack connectivity.

High-altitude drones have also been proposed as a way to generate electricity, because strong winds blow more reliably well above the ground. Known as wind drones or energy kites, such drones are tethered so that cables can deliver the electricity back to the ground.

At the lowest end of the spectrum are insect-like drones, just a few centimetres across, that could be used for surveillance inside buildings, search and rescue, or even pollinating plants.

It is a big leap from today’s drones to these sorts of uses. Trying to imagine how drones will evolve, and the uses to which they will be put, is a bit like trying to forecast the evolution of computing in the 1960s or mobile phones in the 1980s. Their potential as business tools was clear at the time, but the technology developed in unexpected ways. The same will surely be true of drones.

http://www.economist.com/news/technology-quarterly/21723002-carrying-cargo-lot-more-complicated-carrying-camera-why-wait

Study: UAVs Could Carry Heart Defibrillators To Cardiac Arrest Victims.

The AP (6/13) reports that "drones carrying heart defibrillators" may be able to "help bystanders revive people stricken by cardiac arrest," according to a research letter published in the Journal of the American Medical Association.


Drones carrying automated external defibrillators got to the sites of previous cardiac arrest cases faster than ambulances had, according to test runs conducted by Swedish researchers.*Andreas Claesson/Courtesy of FlyPulse*

Researchers found that UAVs could deliver the devices "within about 5 minutes of launch" to the scenes of 18 cardiac arrests, which was 17 minutes faster than the average time it took ambulances to arrive. Also covering the story are Reuters (6/13), CBS News (6/13) website, and NPR (6/13)

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Richard Branson's Newest Company Is in the Middle of a Billion-Dollar Space Race *Staff writer, Inc.*@wheresKR

Sir Richard Branson poses alongside Charlie Graham to celebrate Virgin Money's Birthday in Australia on July 7, 2011 in Sydney, Australia.

Richard Branson has his eye on the skies--again.

The entrepreneur's newest venture, Virgin Orbit, launched in March with the goal of launching mini-satellites into space. Now, the Long Beach, Calif.-based venture is moving closer to launching these satellite companies beyond Earth's atmosphere. According to Quartz, the company already has partnerships with several startups and is looking to make its first flights next year.

One of Orbit's clients, Planet Labs, currently has about 150 satellites--the largest fleet of image-taking

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

satellites in history, Planet says--floating above earth. The San Francisco-based company previously told *Inc*. that when the satellites are all online later this year, they'll be capable of collectively photographing the entire surface of the earth in a 24-hour period.

Another client, Virginia-based OneWeb, is looking to launch hundreds of internet-beaming satellites sometime next year.

Virgin Orbit is specifically targeting as customers the mini-satellite companies that have begun springing up in recent years. While traditional satellites can be about the size of a bus, new technological advances. Instead of using a large rocket capable of launching a traditional satellite, Orbit will equip a 747 jet with a rocket attached underneath its wing. The jet will fly to high altitudes, then fire off the rocket with the package of satellites enclosed. https://www.inc.com/kevin-j-ryan/richard-branson-virgin-orbit-billion-dollar-space-race.html

FAA Investigating UAV Sighting Near Charlotte Douglas Runway.

The Charlotte (NC) Observer (6/14) reports that the FAA said that "the crew of PSA Airlines flight 5123...reported seeing a drone about 1.5 miles from Charlotte Douglas International Airport as the plane prepared to land Friday afternoon."

The FAA is investigating the incident.
http://www.charlotteobserver.com/news/local/article156057004.html

Drone technology has made huge strides

Originally a military technology, drones are now benefiting from rapid advances in consumer electronics

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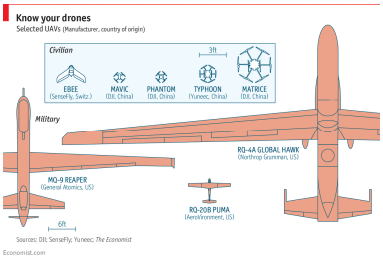
THE first drones were military. The use of pilotless flying machines as weapons dates back to the siege of Venice in 1849, when Austrian forces launched balloons laden with explosives against the city. But the origin of military drones is usually dated to the development of uncrewed, remote-

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

controlled aircraft for use as targets by anti-aircraft gunners after the first world war. The first truly successful example was the de Havilland DH82B Queen Bee, which entered service in Britain in 1935 and seems to have been the inspiration for calling such aircraft “drones” (after stingless male bees); Germany’s V-1 flying bomb was another early drone.

At one end of the spectrum are small, hand-launched fixed-wing surveillance drones such as the Raven, Wasp and Puma, all made by AeroVironment, which fly either autonomously or under short-range remote control. The Raven, used by many countries’ armed forces, is the world’s most widely used military UAV, with around 20,000 units deployed; it can fly for up to 90 minutes. Larger drones like the Predator and Reaper can typically stay aloft for 12-20 hours and carry weapons. Biggest of all are long-endurance, high-altitude reconnaissance drones such as the Northrop Grumman Global Hawk, which can loiter over an area for 32 hours, longer than any human pilot.



Perhaps surprisingly, the recent rise of consumer drones owes little to military systems. Instead, it springs from two completely different technologies: hobbyists’ radio-controlled (RC) aircraft on the one hand and smartphones on the other. Many people working in the drone industry started out flying smal RC aircraft powered by tiny petrol engines, which were “annoying, messy and super-finicky”, says Adam Bry of Skydio. The combination of brushless electric motors and lithium-polymer batteries, used in laptops and smartphones, allowed RC aircraft to be electrically powered, making them lighter, quieter and more reliable.

Military and consumer drones alike are being transformed by rapid progress in two cutting-edge areas of drone research: autonomy and swarming. If you automate away the need for a skilled operator, drones suddenly become much more useful. Military ones that do not require the oversight of a human operator can be radio silent and stealthier. Consumer ones can follow runners, skiers or cyclists and film them from above. Commercial ones can fly a specific, pre-planned path over a field, building site or quarry, avoiding obstacles as they gather data. Improved flight-control algorithms, more on-board processing power and progress in machine vision will allow drones to handle more decisions themselves, rather than relying on fallible or inexpert humans. Most existing drones simply move the pilot from the vehicle to the ground. The next generation of drones will not need pilots at all–just orders. http://www.economist.com/news/technology-quarterly/21723001-originally-military-technology-drones-are-now-benefiting-rapid-advances

16June17

The future of drones depends on regulation, not just technology

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

Engineers and regulators will have to work together to ensure safety as drones take to the sky

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MOVING bits around the internet is one thing; moving atoms around in the real world is something else entirely. In the two decades of the internet era, many world-changing technologies—web-publishing, file-sharing, online auctions, internet telephony, virtual currencies, ride-hailing—have raised new legal and regulatory questions. In each case, regulators had to work out the rules after the event: figuring out how libel law applies to the web, banning the sale of Nazi memorabilia, deciding whether Bitcoin is a currency, determining whether Uber drivers are employees or contractors, and so on. But drones are a different matter, because of the danger that flying robots pose to life and limb, and the existence of strict rules that govern the use of physical airspace. Their future will depend as much on decisions made by regulators as it does on technological advances. How will it play out?

It is clear that the complexities of operating drones in large numbers have barely begun to be understood. As the first widely deployed mobile robots, drones already offer many exciting possibilities today, and no doubt other, as yet undreamed-of uses will follow in the future. Frank Wang, the founder of DJI, pictures people being followed around by tiny personal drones, like fairy sidekicks. Astro Teller of Google foresees delivery drones that can come up with any item on demand. And passenger drones might some day act as magic carpets, whisking people across cities from rooftop to rooftop.

Drones make the extraordinary power of digital technologies physically incarnate. But because they operate in the physical rather than the virtual world, exploiting the many opportunities they offer will depend just as much on sensible regulation as on technological progress.
http://www.economist.com/news/technology-quarterly/21723000-engineers-and-regulators-will-have-work-together-ensure-safety-drones-take

An Alphabet executive now leads an influential U.S. drone policy association

Laura Ponto is the new chairman of the board of the Commercial Drone Alliance.

BY APRIL GLASER@APRILASER JUN 13, 2017

Laura Ponto is the new chairman of the board of the Commercial Drone Alliance, a leading industry association that advocates for U.S. drone policy. Ponto is currently the head of public policy at Project Wing, the drone project under Alphabet's moonshot lab, X.

Ponto joined X in March. Previously she served for more than 10 years as a senior attorney at the

Federal Aviation Administration, helping to craft drone policies for part of that time. Before the FAA, Ponto also held positions at the Department of Justice, the Senate and the Department of Transportation, according to her LinkedInprofile.

Ponto joins the board of the CDA at a time of regulatory uncertainty for the industry.
https://www.recode.net/2017/6/13/15794388/alphabet-executive-project-wing-drone-delivery-association-policy-faa-air-traffic-control

Google makes it easier for businesses to fly fleets of drones with new flight management tool from Project Wing

On Tuesday, Project Wing conducted a series of tests developed by NASA and the FAA to demonstrate whether unmanned aerial vehicles can safely navigate around obstacles. Here are the results. By Hope Reese | June 8, 2017

On Tuesday, Google's Project Wing, which is working on developing an unmanned aircraft delivery system, made steps to ensure drone safety via a new flight management tool. At the FAA test site, run by the Virginia Tech Mid-Atlantic Aviation Partnership (MAAP), Project Wing set off unmanned aircraft in a series of tests developed by NASA and the FAA, meant to see how well its UTM (UAS Air Traffic Management) platform would perform.

In order to test whether drones can handle complex pathways, navigating around obstacles, three aircraft from the company Wing, operated by a single person, performed pickup and delivery of a package at the same time as two Intel Aero Ready to Fly Drones (operated by Intel directly over LTE) and a DJI Inspire, operated by MAAP, were involved in automated search and rescue missions, according to a blog post on Wednesday by James Ryan Burgess, co-lead of Project Wing.

While traditional navigation usually involves manually steering around obstacles, the UTM platform successfully circumvented objects by forging new pathways. The tests, wrote Burgess, demonstrated that the UTM could manage multiple drone flights simultaneously.
http://www.techrepublic.com/article/google-makes-it-easier-for-businesses-to-fly-fleets-of-drones-with-new-flight-management-tool-from/

Incredible drone race footage will give you extreme adrenaline rush as pilots battle it out for top spot Adam Starkey for Metro.co.uk 13 Jun 2017

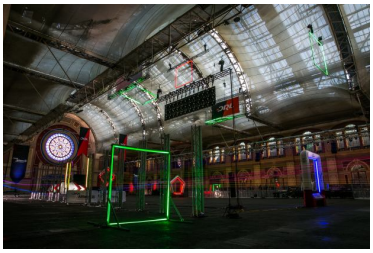
Ever wondered what the next advancement in sport racing would be after Formula One? You need to

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

feast your eyes on the futuristic wonders of drone racing.

The current season of the drone racing league is set to reach a climax at London's Alexandra Palace on June 13, where world-class pilots race drones through a sequence of rings at speeds over 130 KPH.

This isn't just people with remote controls and a wonky aerial either, they're equipped with special goggles which enables pilots to see through the eyes of the drone as they fly around the palace.



The Drone Racing League custom drones, the Racer3, in action at Alexandra Palace for the World Championship (Picture: Paston/PA Wire)

See the video at http://metro.co.uk/2017/06/13/incredible-drone-race-footage-will-give-you-extreme-adrenaline-rush-as-pilots-battle-it-out-for-top-spot-6705707/

China launches record-breaking drone swarm 11 Jun 2017

China has launched a record breaking swarm of 119 fixed-wing unmanned aerial vehicles, authorities said. The feat broke the previous record of a swarm of 67 drones, the China Electronics Technology Group Corporation (CETC) said.

The 119 drones performed catapult-assisted take-offs and formations in the sky.According to the CETC, "swarm intelligence" is regarded as the core of artificial intelligence of unmanned systems and the future of intelligent unmanned systems. Zhao Yanjie, an engineer with CETC, said that since drones were invented in 1917, intelligent swarms have become a disruptive force to "change rules of the game".

Reports in the Chinese official media in the recent past said Chinese military is also testing to launch mass armed drones as a new technique in battle conditions. China is currently the largest maker of drones. http://www.dnaindia.com/science/report-china-launches-record-breaking-drone-swarm-2468680

These Six Luxury Underwater Drones Are Disrupting Fishing and Fun

Zara Stone

PowerVision's underwater drone

It's a great time to be in the drone business, with the likelihood of aerial pizza and Amazon packages being delivered by air getting closer and closer.

However, in the case of drones, the sky is definitely not the limit as they're also invading the deep. The military has had their hand in this for some time now, with over 255 configurations according to The Bard College Center for the Study Of the Drone, but the consumer market has been lagging behind. Until now.

Enter the underwater drones, consumer submersibles that are emerging as playthings for serious hobbyists and recreational users alike. These waterproof semi-autonomous drones serve a number of purposes, from perfecting those underwater selfies to fish seeking sonar devices. Those waterways may get crowded... https://www.forbes.com/sites/zarastone/2017/06/15/these-six-luxury-underwater-drones-are-disrupting-fishing-and-fun/#2669e953d978

Nvidia's autonomous drone keeps on track without GPS

Paul Ridden June 14, 2017


The Nvidia drone uses camera and deep learning to understand and navigate its way down a forest trail (Credit: Nvidia)

Researchers from GPU maker Nvidia are currently working on a navigation system that relies on visual recognition and computer learning to make sure drones don't get lost in the woods.

Rather than build a flying bot from scratch, Nvidia's researchers opted to use an off-the-shelf drone. The navigation system has the company's Jetson TX1 machine learning module at its heart, which is fed visual data from two cameras.

Still at the experimental stage of development, it was initially designed to make its way through forest trails on rescue missions – looking out for fallen hikers or storm damage, for example. But the team believes the low-flying drone could broaden its scope to anywhere GPS would prove less than reliable

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com

or not available at all, including canyons, crowded city landscapes or checking stock in a warehouse. The system could even be adapted to search for damaged cables underwater.

"This works when GPS doesn't," said the team's technical lead Nikolai Smolyanskiy. "All you need is a path the drone can recognize visually." http://newatlas.com/nvidia-camera-based-learning-navigation/50036/

Boeing To Offer UAV Inspection Services To International Market.

Shephard Media (6/15) reports that Boeing's Insitu "plans to offer its full-service UAV infrastructure inspection system internationally." The company has been using ScanEagle UAVs to inspect "well heads, pipelines and processing facilities in Australia" for more than a year. Boeing plans to offer its ScanEagle for a US Coast Guard requirement "for a UAV to operate from its national security cutters." Another "major competitor for the requirement is likely to be Textron's Aerosonde UAV."

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.com