3D-Printed Military Drone Takes Flight

Nicholas West | Activist Post

3D printing offers a range of potential benefits and open-source solutions to free humanity from centralized corporate and police state shackles. Naturally, the good elements are being fought tooth-and-nail, while the aberrant forms are brought to us by the military-industrial complex as an essential security solution.

3D-printed military drones are now being explored, with some successes already being reported. In May of last year, Robo Raven (discussed below) was announced which incorporates 3D-printed components to produce independently flapping wings.

Now the Department of Defense has provided funding to the University of Virginia to develop the first fully 3D-printed UAV called the The Razor that can be created in less than a day with off-the-shelf parts and a smartphone running a customized flight-control app.

> *The latest (third) prototype is made of nine printed parts that click together like LEGO. The center of the plane is all one piece, with a removable hatch that offers access the inner cargo bay. All of the electronics live in there, including a Google Nexus 5 smartphone running a custom-designed avionics app that controls the plane, and an RC-plane autopilot that manages the control surfaces with input from the phone. The Razor's wing structure is one piece, with an aileron, winglets, and mount for the small jet engine that clip on.*

> *"This program was really tasked with showing what is possible."*
>
> *The aircraft, with a four-foot wingspan, weighs just 1.8 pounds. Loaded with all the electronics gear, it comes in at just under 6 pounds. That lets it fly at 40 mph for as long as 45 minutes, though the team's working to get that up to an hour. An earlier prototype could top 100 mph, and the team believes the plane could hit 120 mph, at the cost of a very quickly drained battery.*

As described, it could be used for almost continuous surveillance ecameras and sensors.

> *It can carry 1.5 pounds, so attaching a camera to it would be no problem. The batteries take two hours to fully charge and are easily swapped out, so if you've got three or four packs on hand, the Razor can be in the air nearly continuously. The plane can be controlled from up to a mile away, or fly on its own using preloaded GPS waypoints to navigate.*

> *Here's where the 3-D printing really comes in handy: The design can be modified—and reprinted—easily, to be bigger or smaller, carry a sensor or a camera, or fly slower or faster. The plane can be made in 31 hours, with materials that cost $800. Electronics (like the tablet-based ground station) push the price to about $2,500. That's so cheap, it's effectively disposable, especially since you can make another one anywhere you can put a 3-D printer. If one version is flawed or destroyed, you can just crank out another.*

And crank them out, they will. As we also recently learned, drones with facial recognition are all set to go. And tiny A.I. humanoids are even being prepared to fly them. As time goes on, all of these technologies will merge into smaller and smaller applications, eventually hiding in plain

sight. Meanwhile, the military is exploring other 3D-printing applications – from battlefield food supply to bombs to medicine.

End of update

New 3D-Printed Drone Mimics Nature

The march toward developing drones that mimic nature continues unabated. Robobee has received a lot of attention lately for taking flight as a possible replacement pollinator for the declining natural bee population, while also offering the dual-use swarm surveillance and weapons' capabilities sought after by the military.

The latest drone to come out of development utilizes 3D-printed components to produce a first of its kind: independently flapping wings. So effective is its mimicry, that product developers documented Robo Raven being attacked by a real hawk in the promo video below from Maryland Robotics Center:

It is the independently flapping wings enabled by 3D fabrication of its overall structure that offer this stunning level of drone evolution:

> *What enables Robo Raven's impressive aerobatics? Independently flapping wings. It took the team eight years and a number of failed prototypes to arrive at this stage. Wing independence requires a heavier microcontroller and battery. To trim the robot's total weight, the team turned to modern fabrication techniques to 3D print and laser cut light polymer parts. As for those tricky moves, with their independently flapping wings the team can now program and run any wing motion they like. (Source)*

The market in miniturized drones is exhibiting the same

parallel growth as the larger drone market which has seen countries and states within the U.S. rush to become drone testing sites. The mimicking of nature is the latest element that heralds a range of science fiction nightmare scenarios including increased miniturization that extends right down to the nano-scale. This will go beyond what we currently call drones – that which we can at least see – and creates a level of unseen and pervasive surveillance and detection.

Here are some surveillance and detection concepts already in operation or under development beyond the newly announced Robobee and the Robo Raven seen above.

- A group of smaller surveillance drones called NAV (nano air vehicles) or MAV (micro air vehicles) already have been commissioned: mapleseed drones; sparrow drones by 2015, dragonfly drones to fly in swarms by 2030, and eventually a housefly drone. And if the reconstruction of nature doesn't pan out, nature itself can be hijacked using electrical impulses to create cyborg surveillance insects being studied at major universities.
- Nano sensors for use in agriculture that measure crops and environmental conditions.
- Bomb-sniffing plants using rewired DNA to detect explosives and biological agents.
- "Smart Dust" motes that wirelessly transmit data on temperature, light, and movement (this can also be used in currency to track cash).
- Nano-based RFID barcodes that can be embedded into any material for tracking of all products . . . and people.
- Devices to detect molecules, enzymes, proteins and genetic markers – opening up the door for race-specific bioweapons, as mentioned in the Project For a New American Century's policy paper Rebuilding America's Defenses.

As with all technology, there are two sides. We would be wise to promote the many open-source benefits so that we can keep

control over a useful technology, rather than permit the military to once again monopolize it and only allow citizens to receive whatever trickle-down crumbs they throw our way.

Sources:

- https://unorthodoxideas.blogspot.com/2013/04/robo-raven-step-towards-bird-inspired.html
- https://www.wired.com/2014/09/military-grade-drone-can-printed-anywhere

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