



ROBOTICS

# It's not a bird, it's a drone

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The drone bird is already flying among us. It is a prototype, for now... But its projection is such that even the US Air Force **has** [<http://www.airforce.com/>] become interested in the project to test new military applications. This invention has been created by the director of the company **Vishwa Robotics** [<http://vishwarobotics.com/>] and robotics researcher at MIT, **Bhargav Gajjar**, who from his office in Cambridge (Massachusetts) tells me about the advantages of the device, bird -drone in hand.

At first glance, **it looks like a toy bird**. It's scary to touch it for fear of ruining the invention in front of its creator. Gajjar encourages me to move its wings and tail. **The feathers colored with a marker give it a handmade touch**. "When it's created to scale, it will look different," says the researcher as he removes a piece of *polystyrene* that acts as the animal's body and reveals the wired belly of the device.

The drone has a wingspan of less than a metre with its wings spread out and weighs around 250 grams, which would be the weight of the bird it resembles: the **sparrowhawk**, a species of **falcon** common in North America. The skeleton of the animal is made of carbon fibre "to limit the weight to a minimum" and the wings are made of a type of polyester (mylar) "which is very resistant," says Gajjar. **"All the parts can be bought separately on the market,"** says the scientist.

What moves everything is a mechanical wheel inside the body that activates the flapping of the wings. And, behind, the tail acts as a rudder using two parallel pieces, the one that rises makes the bird turn to the opposite side. **The scientist highlights "the unique design" of the tail that no other vehicle of this type has**. The device is piloted by remote control, "as if it were a remote-controlled car," explains the researcher. **The drone has an autonomy of 30 minutes of flight**. However, anchored to a branch, it can be held for up to four days at a time.

"It's been a year's work, but do you know what's costing me the most?" the researcher asks me. "Mmm... flying against the wind, could it be?" I dare say. The researcher laughs and says: "You'd never guess... **The problem is the other birds. I've flown it outdoors and on a couple of occasions, the drone has been attacked by other birds who see it as a threat**." The conclusion is that "it couldn't be more perfect, it blends totally with nature," he adds with a proud gesture.



It should be added that, as for the anchoring system, it is so perfect that it allows the bird to jump and take flight without the need for human intervention. Likewise, the extendable legs allow the bird to have basic mobility such as turning or walking a few steps.

## Applications

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As for military purposes, the drone is designed for surveillance tasks. **A camera or a low-frequency sensor can be incorporated into the drone to capture enemy movements or communications in war zones** . The scientist adds that it is much more effective to use this type of drone for such missions than current devices that "cost thousands of dollars" or "employ soldiers who put their lives at risk."

On a commercial level, the drone's flights are also for surveillance. "I imagine it to study the **control of car traffic, for example, or to extract information from places hit by a natural disaster** ," says the researcher.

## 'Robotic Hand'

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Gajjar is also currently working on developing a **robotic hand** that faithfully reproduces the movements of a human hand. The idea is to implement this device in devices that operate under the sea to perform underwater research or rescue tasks.

For this project, which the researcher is carrying out in cooperation with the US Navy, the challenge is to make the hand "sufficiently resistant to withstand the pressures of great depths, without compromising the maneuverability of the fingers of the hand."

The researcher claims that the robotic hand is capable of manipulating tools, drills and other accessories.

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