

It works without a pilot, has great precision and can be used for military purposes

## «Aracnocóptero»: the eight-legged aircraft and Spanish manufacturing

The Bisite research group of the University of Salamanca and the company Arbórea have developed the 'aracnocóptero', a device that allows flight without a pilot and receives this name because, like spiders, it has eight limbs.



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Two and a half years of work have allowed the creation of a unique system due to its carrying capacity and the distances to which it can be communicated, in addition to having many potential military and civil uses, since it can take images and other types of data.

"The platform consists of the aircraft, a communications block and a control base composed of a very resistant tablet computer and a commanding such as videogames", explains Carlos Bernabéu, founder of Arbórea, a company located in the Science Park from the University of Salamanca.

The Bisite research group of this university and the company have just created an 'aracnocóptero'. The operation is very simple and can be used to supervise military operations or to carry out digital mapping work.

In the market there are many similar systems, called UAV (unmanned aerial vehicle), but the 'aracnocóptero' has much more advanced features, since it allows a vertical take-off and carry a load of up to 3 kilograms (the device weighs 3'5), is removable, is transported in small suitcases. It also allows flights with extraordinary stability compared to other devices of this type, which vibrate too much to take accurate images.

In other systems, analog radio communications are close to 1.000 meters, but "our communications protocols are digital, with a theoretical range of 100 kilometers in optimal

conditions. With digital radio waves, we have all the information in real time in the tablet, where we see the video and the position of the device on a map", says Bernabéu.

The 'aracnocóptero', made of titanium and carbon, is very resistant, it has a camera that films its own flight and multiple sensors: pressure to control its height, a sonar to facilitate automatic landings and automatic take-offs, gyroscopes, magnetometers and accelerometers to win stability. In addition, with GPS it is given automatic flight patterns for it to execute and the information is displayed on the user interface.

In addition, you can add all the instruments needed for the type of work to be performed and the only limit is the load capacity, so you could transport day, night and thermal cameras or laser measurement and scanning systems to make topographic profiles.

The sensors are getting thinner and lighter, the electronics of the flight system are getting smaller and more efficient and the batteries, which currently hold up to 40 minutes, evolve very quickly to increase the duration of the flight.

### **Fly over a Somali pirate ship**

Currently, "we have operational prototypes and there are interested companies", said the head of Arbórea, which is currently based in the Incubator of technology-based companies of the Science Park of the University of Salamanca. Flying over a Somali pirate ship can be a military use, but in the civil field it serves to analyze from the air a monument that must be restored or to study the state of power lines with great savings.

The researchers work in an artificial intelligence system with the aim of imitating the communication model of social species such as birds or swarms of bees to establish intelligent flight patterns with groups of these devices. For example, "if we look for radioactivity, we deploy several devices and they communicate with each other through this digital protocol, each one knows where the others are and act to cover areas without overlapping. If one detects radioactivity, the others come to perform the measurements timely". This multi-agent system mimics gregarious animal models, since "the logical schemes are the same".

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