INNOVADORES
DE EL MUNDO
CASTILLA Y LEÓN
NÚMERO 72 / LUNES 10 DE OCTUBRE DE 2011

Defence

# Pirates Intercepted Before Attacking

Arbórea and the University of Salamanca design an aircraft that, in one minute, can fly over a suspicious, incognito ship, capturing images and video of its crew to determine whether they're fishermen or pirates

Its appearance, in person, is intimidating and does justice to its name: the aracnocóptero. The toughness of a spider that could fly, whose webs extend over the sea. Its objective: prevent pirate boarding, which can unfold at a dizzying speed.

By the time the crew realizes what's happened, it could already be too late. The ships that navigate these dangerous waters have little time to react to the enemy. "The small scale boats act speedily, it's difficult to distinguish a friend from an enemy; are they fisherman or pirates?"

The latest kidnappings on the high sea, which made a wave in the media, (the Spanish tuna fisherman Alakrana and Playa de Bakio) have made clear the lack of boats that fish in these waters. Safety agencies all over the world urge them to use protective measures and technological advances that protect the crew.

A Salamancan alliance between the company Arbórea (located in the University of Salamanca's Science Park) and the Bisite group of the same university have happened upon a platform that intends to avoid scares and save lives.

**EVERY LAST DETAIL**

Together they have designed an aircraft that doesn't require piloting, and can be unfolded immediately on the deck when a boat detects an unknown water vehicle. In less than a minute, it takes off and arrives at its target: it stays in the air, above the suspicious floating vehicle.

All this thanks to a combination of sensors (GPS, altitude, gyroscopes and accelerometer), technical measurement equipment, image capture, and video recording in high definition of the occupants of the ship, without them noticing.

The technological cocktail endows it with a high level of stability that softens the vibrations, allowing for silent operation. It can even withstand strong gusts of wind and stay in the same position without shaking.

At that moment (and in real time) in the ship from where it took off, digital images captured by the aircraft are being received. “We can check to see if they have weapons or what their behaviour is like. Thus, crucial time is gained to anticipate and avoid the attack. The appropriate maritime alarms are activated” indicates Carlos Bernabéu, from the Arbórea Environmental Management Company.

“There are international NATO fleets that can’t activate the alarm every time they see unidentified boat because they could just be fisherman, but, with this technology, they’ll be able to act immediately”, he adds. The aircraft is called the aracnocóptero and it’s somewhere in between a spider and an octopus with 8 tentacles and it’s very precise. The resolution is so high that “you could even see the eyelashes of the boat’s occupants” assures Bernabéu.

The technological platform is formed, in addition to the aircraft, of a communication block and control centre that consists of a tablet (a screen with reduced dimensions) and a ‘videogame type’ remote control to handle to aerial device from the boat.

**INCOGNITO**

The aracnocóptero is designed to work incognito in remote areas. It can also carry out preprogramed missions automatically which aids in routine day-time and night-time vigilance. Darkness or intense light won’t be the assailants’ shield any longer. It captures day-time and night-time images in multiple formats.

It’s foldable and light and has a range of up to 100 kilometres. “The long distances aren’t the interesting part, rather the ultraprecise information” says Bernabéu.

The customary vigilance systems are usually carried out by manned aerial means which has “human risks, costly take-off logistics and a geographic dependence on aerial bases”. This list of ‘buts’ will see their end with the arcnocóptero.

One of most important advantages resides in its user friendliness. It can be launched from anywhere with no prior preparation. Its pilot doesn’t need experience in aircraft handling, in comparison to other options that are “very complex, not as light nor as resistant and require expertise”.

Its flight time and communication security gives it the advantage over any other portable, quick-unfold system”, moreover, the expected costs will be, “only half of the sale price of other current equipment.”

One fundamental aspect that influenced the design was the lack of sophisticated landing pads that one faces while in the middle of the sea.

Nevertheless sophisticated programming allows for vertical take-off and landing from the deck. “This is vital to be able to do it from the ship and so that it can be landed automatically”. That’s why its performance is so quick.

The final touch, still in its initial stages, is just as ambitious as it is possible: that the aracnocóptero can’t ‘drown.’ The researchers are working on a device that can land in the sea and intend to achieve that in a few weeks.

That’s why the added specifications are fundamental to the base materials (titanium and high modulus carbon fibre), as well as for inclement weather.

Although the multi-rotor aircraft hasn’t hit the market yet, it’s predicted to come out in a very short period of time and they plan on international expansion. For now, interest is building in Security Agencies in various countries.

The project, piloted by Carlos Bernabéu and Juan Manuel Corchado (Leader of the Bisite Group) was presented at a closed-door congress organized by NATO, the University of Salamanca, and the University of Carlos the III in Madrid, which took place a few days ago in the Salamanca capital.

“An absolute success. They showed clear interest. There is a clear market demand. It’s revolutionary. There’s nothing like it and it’s going to solve a lot of very serious problems” asserts Carlos Bernabéu, to which Juan Manuel Corchado adds, “The pirate problem on the high seas has become very worrisome lately.”