Flight of the RoboBee

The latest buzz in robots is a mechanical bee modeled after a real insect

BY TYRUS CUKAVAC | FOR SCIENCE WORLD MAGAZINE

Honeybees, bumblebees, and wasps may need to look out for some new flying critters. Scientists at Harvard University in Massachusetts have created a new kind of mechanical “insect,” called RoboBees. RoboBees fly through the air by remote control. They are about as big as a quarter and weigh less than a tenth of a gram.

“This is the first demonstration that you can make insect-like robots and control them in flight,” says Robert Wood, one of the Harvard professors who helped create the robots.

But what’s the use of tiny flying robots?

PROGRAMMED TO PROTECT

RoboBees are currently controlled remotely, like a toy helicopter. But the scientists are working on building small brains for them. That will allow the robots to carry out important tasks without needing humans to control them. One of those tasks is assisting with search-and-rescue operations. For example, the RoboBees could help get cameras inside a collapsed building.

The robot bees could also be programmed to monitor, or keep track of, environmental conditions. Dozens of them could fan out over a wide area and detect dangerous chemicals that could harm wildlife.

And RoboBees might just be able to help real bees with an important job. Bees play a key role in agriculture, or farming. They pollinate plants, which helps the plants produce seeds and fruit. For the last few years, many bees have been mysteriously disappearing, which could mean trouble for farming in the future. RoboBees may be able to pick up the slack if there are not enough real bees available.

MIMICKING ANIMALS

These tiny robots may someday help with search-and-rescue operations in dangerous areas.

Kevin Ma and Pakpong Chirarattananon

JULY 24, 2013
Despite their name, the RoboBees' flight was patterned after that of a fly. The robots' wings beat about 120 times per second. But RoboBees are not the only robots that people are basing on animals. Scientists around the world are borrowing designs from the animal kingdom. In the works are robots that mimic mules, snakes, salamanders, rats, and hummingbirds—among others.

Scientists want to use these robots to help solve problems. The robotic mule, currently called LS3, is designed to carry equipment for soldiers in battle. And like the RoboBee, a robotic snake is being developed for search-and-rescue missions in hard-to-reach places.

Kevin Ma, another scientist working on the project, says the prospect of a robotic bee colony remains years away. Developing RoboBee brains is a necessity. The RoboBees also need a power source small enough to carry. But the ability to mimic the flight of insects is a huge step forward for robotics. "It is a demonstration of how far human engineering ingenuity has reached," he says.