#TECHNOLOGY

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ROBOTICS MAKES A BEELINE FOR NATURE'S BLUEPRINTS

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Robots are cool. They roll, beep, buzz – and when you ask them profound philosophical questions, their heads explode. Or so Hollywood would have you believe. But whereas fiction prides itself on the weird and wacky, the reality is that nature got it right first time.

Inspired by the biology of a bee, Harvard University's 'RoboBee' neatly demonstrates the value of nature's original blueprints. Not much bigger than a pound coin or nickel, RoboBee is a triumph of microrobotics, and sports some staggeringly ingenious features borne out of its necessarily small size.

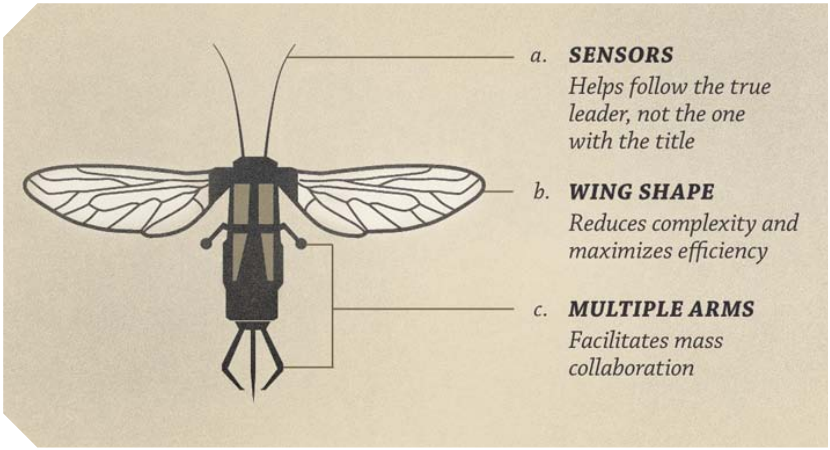
Unlike other robots, RoboBees are not built, but printed. Their 3D structure (including a motor) is machine-produced onto a metal sheet and then 'popped' into shape, making it possible to produce swarms of the tiny machines breath-takingly quickly. RoboBee also uses some groundbreaking flying technology, making use of something called a 'hybrid power control actuator'. This allows the tiny airfoil wings to drive the vehicle as well as steer it, unlike in conventional aircraft such as airplanes, where the turbines and rudders are separate entities.

But why bother going to so much effort to mimic Mother Nature? Don't we already have perfectly adequate solutions to the problem of flight? Well, not quite. RoboBee has more maneuverability than other similar-sized air vehicles that use propellers, and is also less likely to break (as rotating parts have a tendency to get jammed).

But Harvard is not the only lab currently being guided by nature: there are spider-bots for navigating uneven terrain, handling devices that are modeled on an elephant's trunk, and (laughably) floating penguins that swim through the air. These machines have the potential to become as tailored to their surroundings as their biological counterparts, and could therefore have important uses – RoboBee, for example, has major implications for search and rescue.

It isn't merely about developing exciting new technologies: these bio-inspired robots can also enhance our understanding of the creatures they mimic. The better a machine is able to imitate the behavior of an animal, the more likely it is to go unnoticed by the animal itself, making it possible to better observe organisms in their natural habitat. This principle could even have implications in the military sphere: a robot that can convince an animal it is one of them is more likely to convince a radar dish of the same thing.

The one thing that RoboBee still needs to be able to fly out of the lab is a power source small enough to carry onboard. Even the most compact of today's batteries are too heavy, leaving the latest robots tethered to a fine power cable. It seems we still have a bit more to learn from Mother Nature.



Reference:

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Ross Harper *recently graduated from Cambridge University having studied Biological Natural Sciences. He spent the last year running his somewhat unconventional advertising business,* ***BuyMyFace.com****, and is now trying his hand at app development with his new company,* ***Wriggle Ltd****. Ross is living proof that you can take the boy out of the lab, but you can't take the lab out of the boy - no matter what crazy scheme he's currently working on, he makes sure to devote a bit of time to keeping with the latest in science news. Feel free to say 'hi' to Ross on Twitter (****@refharper****).*

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