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## NTU and UC Berkeley develop remote-controlled cyborg beetle

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Photo: Nanyang Technological University

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SINGAPORE - An alternative to drone technology has been developed by scientists from the Nanyang Technological University (NTU) and the University of California (UC) Berkeley.

A tiny, electronic backpack that is mounted on top of a giant flower beetle can be wirelessly controlled with a built-in receiver and transmitter, thus minimising human intervention.

In a statement by the university, NTU assistant professor Hirotaka Sato said the technology can be used as an alternative to remote-controlled drones as it could go into inaccessible areas such as search-and-rescue missions.

The joint NTU-UC Berkeley study was also published in *Current Biology*, a peer-reviewed biomedical research journal on Monday.

The giant flower beetle, which is about 6 centimetres in length and about as heavy as two \$1 coins, was found to be able to lift items such as a small microphone and thermal sensor.

The cost of making the high-tech backpack was less than \$10 using mostly off-the-shelf materials, NTU said. It is operated by a microprocessor, which not only combines thousands of transistors onto a 1-cm square chip.

Six electrodes from the microprocessor are connected to the beetle's optic lobes and flight muscles. Signals received wirelessly allow the beetle to take flight, turn left or right, or even hover in mid-flight.

NTU added that the detachable high-tech backpack is "harmless to the beetle" as it will go on to live normally and continue its regular adult lifespan.

Assistant Professor Sato also said that this new finding highlights the potential for further research to improve the precision of the beetles' remote-controlled turns.

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