

2015 年臺灣國際科學展覽會 優勝作品專輯

作品編號	100035
參展科別	工程學
作品名稱	Androcopter, using smartphones as flightcontrollers for Quadrocopters
得獎獎項	三等獎

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Summary

This project proposes that smartphones are capable of steering a quadcopter, doubling as a flight controller unit. This means that sensor results from the smartphone's IMU (inertial measurement unit) are compared with steering commands from the pilot received over Wi-Fi or a RC-transmitter. The idea behind this project was to build a cheap flight control for a quadcopter. Smartphones seemed to be the perfect device because of their dominance in the market. The first step was constructing the quadcopter's frame. I first designed the frame on AutoCAD and then built a prototype out of aluminium. My search for a possibility to connect the engines or low level peripherals to a smartphone led to the «IOIO-Board». After collecting sufficient information about sensor fusion and control theory I started working on my own controller.

Due to the frame's large size the quadcopter is very stable and best suited for aerial photography. Engine control by smartphone using an «IOIO-Board» is fast enough for flight.

A smartphone possesses everything needed to control a quadcopter. The disadvantage of using a smartphone is that the processor has to calculate multiple applications simultaneously. This makes it more difficult to guarantee the correct timing of operations. Nevertheless, external influences such as phone calls do not influence the flight behavior of the quadcopter. As work in progress I have experimented with the implementation of GPS and an onboard camera.

【評語】 100035

1. 利用智慧型手機以及微控制器以控制直升機，具有創意值得鼓勵。
2. 建議可以針對系統穩定的評估與量測作進一步探討。