

Quadcopter sees the woods and the trees

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Steve Cinderby surveys the arboretum. Credit: Howard Cambridge

Academics at the Stockholm Environment Institute (SEI) at the University of York are capitalising on the opportunities offered by the development of low-cost unmanned aerial vehicles (UAV) to monitor, map and explore our cities, countryside and changing environments.

A new project led by Steve Cinderby, deputy director of SEI at York's Environment Department, is using a "quadcopter" equipped with a camera to capture images and create a digital map of the trees in the Yorkshire Arboretum at Castle Howard, North Yorkshire.

The 120-acre arboretum has species from temperate regions from Chile, to Europe, to Australasia. Steve Cinderby was tasked with finding a low-cost way to map the tree locations. He chose a DJi Phantom quadcopter

and mounted a GoPro camera on it that records video and stills, linking to a Wi-Fi tablet that can control and view the images.

He said the quadcopter works well because of its accurate sensing platforms, reasonable cost and accessibility. "This is an off-the-shelf solution that is designed to be simple and easy to use – but it is definitely not a toy and is a very capable piece of equipment. We can add a direct live feed to a screen or goggles to view images being captured in real-time, and the Phantom can also be upgraded to fly pre-specified transects using its on-board GPS. At the moment we aren't doing this and fly the quadcopter manually so we are always in direct control," he added.

The project will provide staff with a detailed digital map of the site that is editable and updateable for research purposes.

"To accurately locate the images on the ground we have collected control points using a differential GPS surveying system," Steve Cinderby said. "This is highly accurate down to a few centimetres – as opposed to handheld GPS that are accurate to within a few metres. Once we have the images we will ask volunteers to collect the tree tag information and link it to a photograph by doing field surveys."

Similar technology could be used for many different kinds of environmental research, Cinderby said. "By putting different sensors on the platform there is the possibility to gather data for a wide range of environmental issues – air pollution, land cover surveying, wildlife recording, heat mapping... I think the potential for low-cost UAVs for [environmental research](#) is quite large."

But he acknowledged that as UAVs become more common, the potential for their misuse – and consequent public and legislator backlash – could increase.

At the arboretum, however, the public response was generally positive: "Most people are fascinated and want to learn how it works, how much it costs, and where they can buy one. A few people were more cautious and suspicious until I explained the purpose of what we were doing. The only slight criticisms have been over the noise when it is flying at low level in the arboretum, since people come here for tranquillity."

Provided by University of York

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