

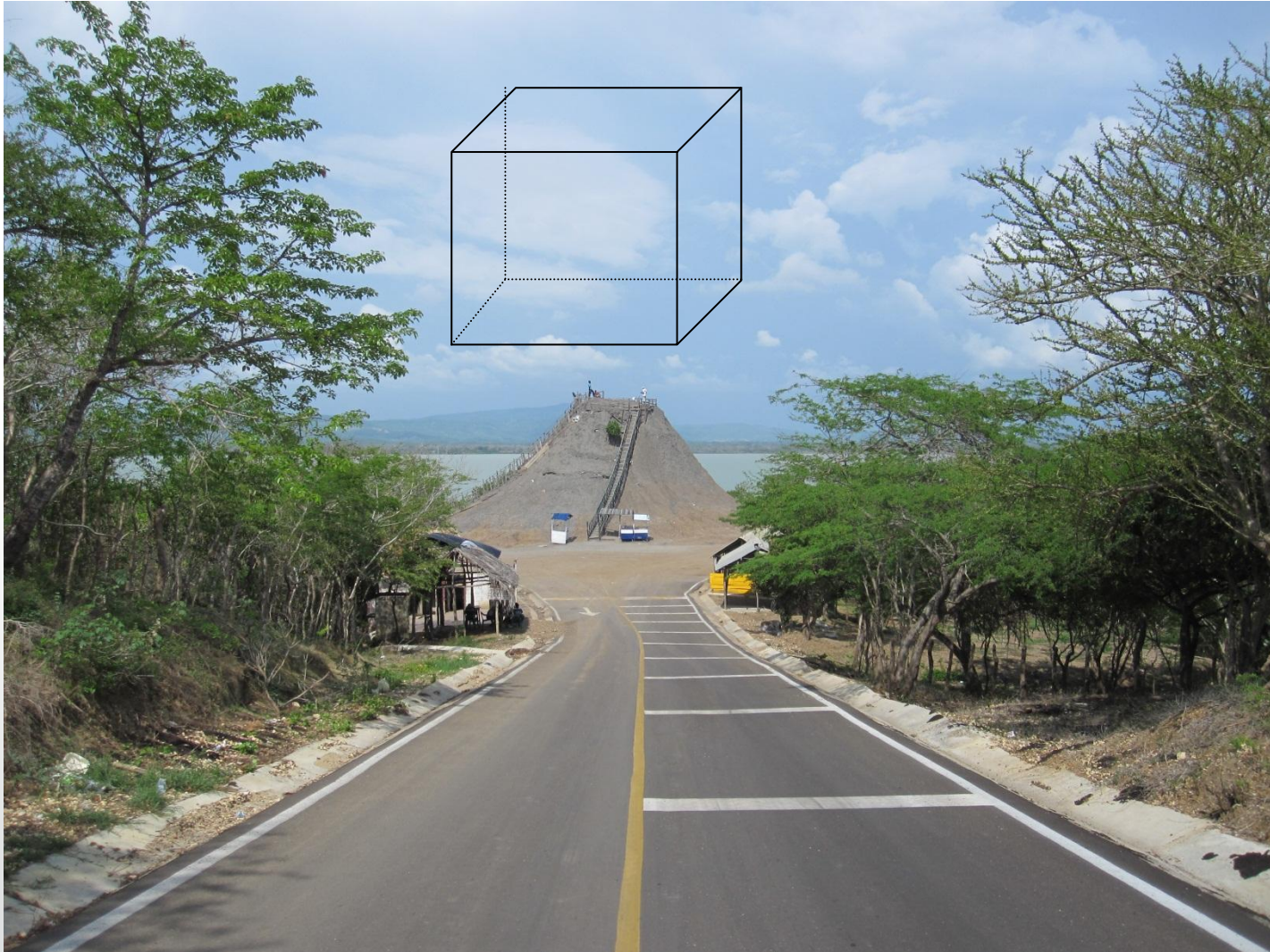
Using the cloud from above the clouds in low cost, high altitude science

Steven Johnston

University of Southampton / PM .NET Gadgeteer, Microsoft Research

Atmospheric Science Through Robotic Aircraft (ASTRA)

UNIVERSITY OF
Southampton
School of Engineering Sciences



Instruments
lost or beyond
economical
recovery
+
they become
pollutants

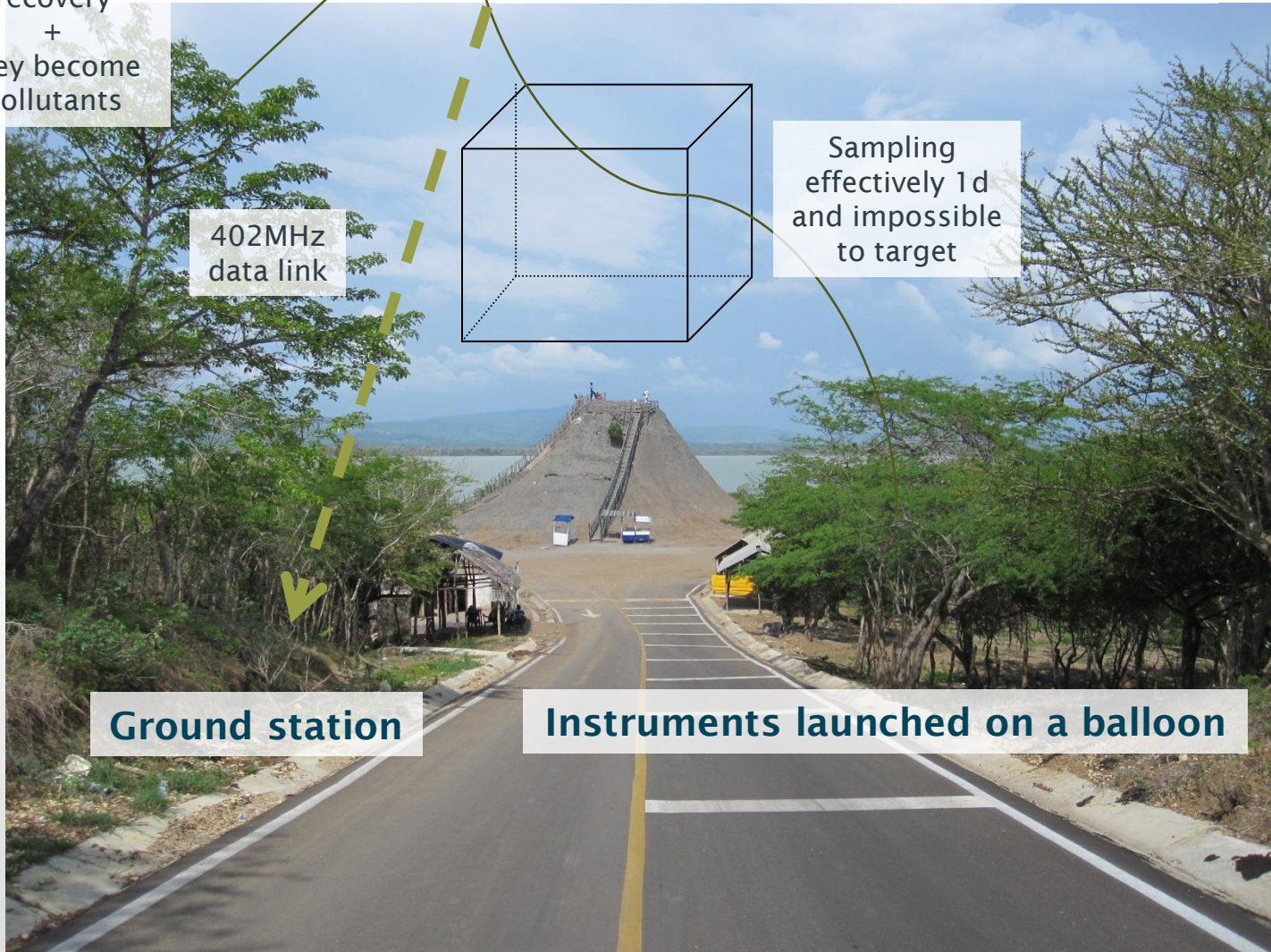
Balloon bursts, Instruments descend on parachute

402MHz
data link

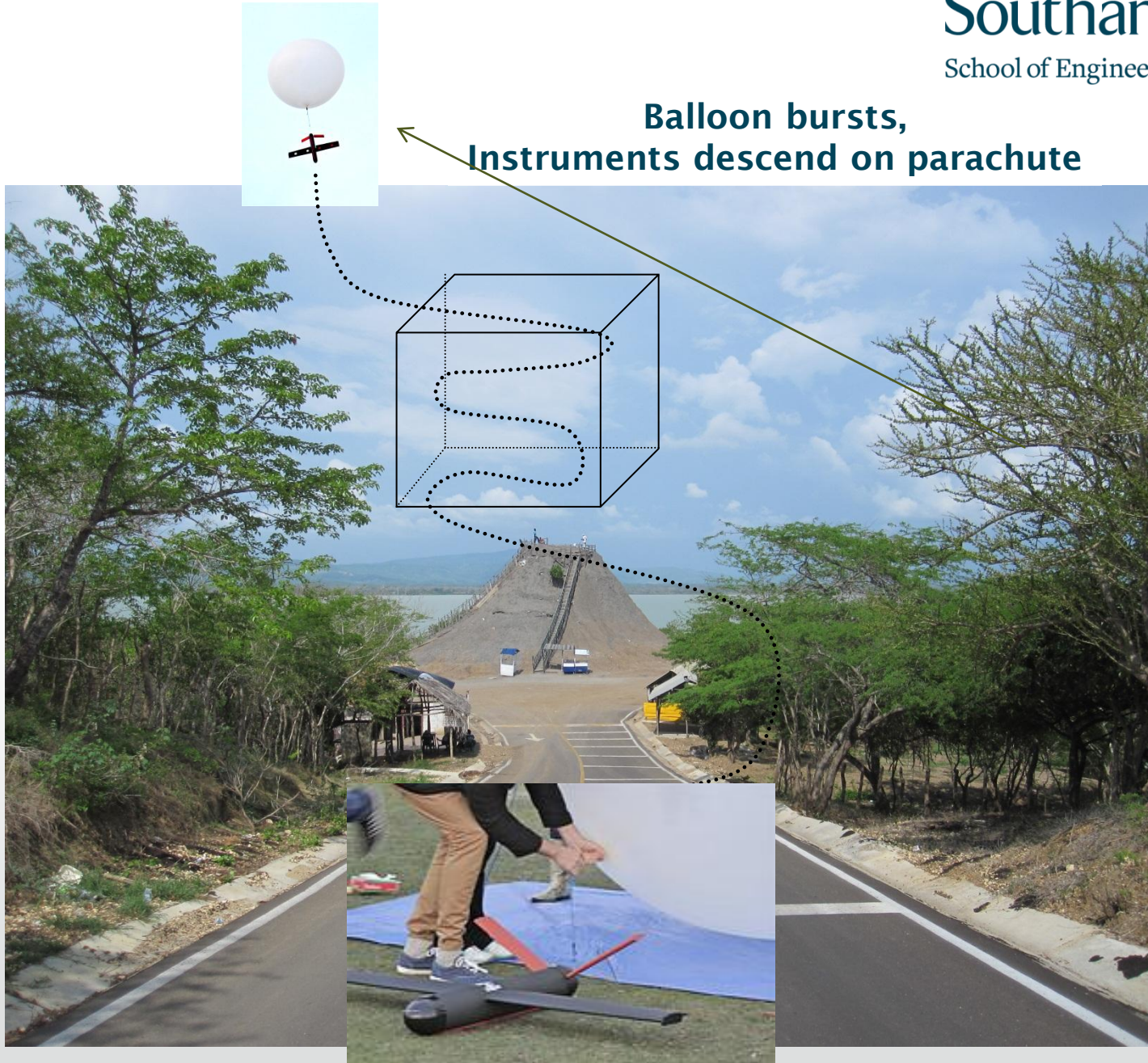
Sampling
effectively 1d
and impossible
to target

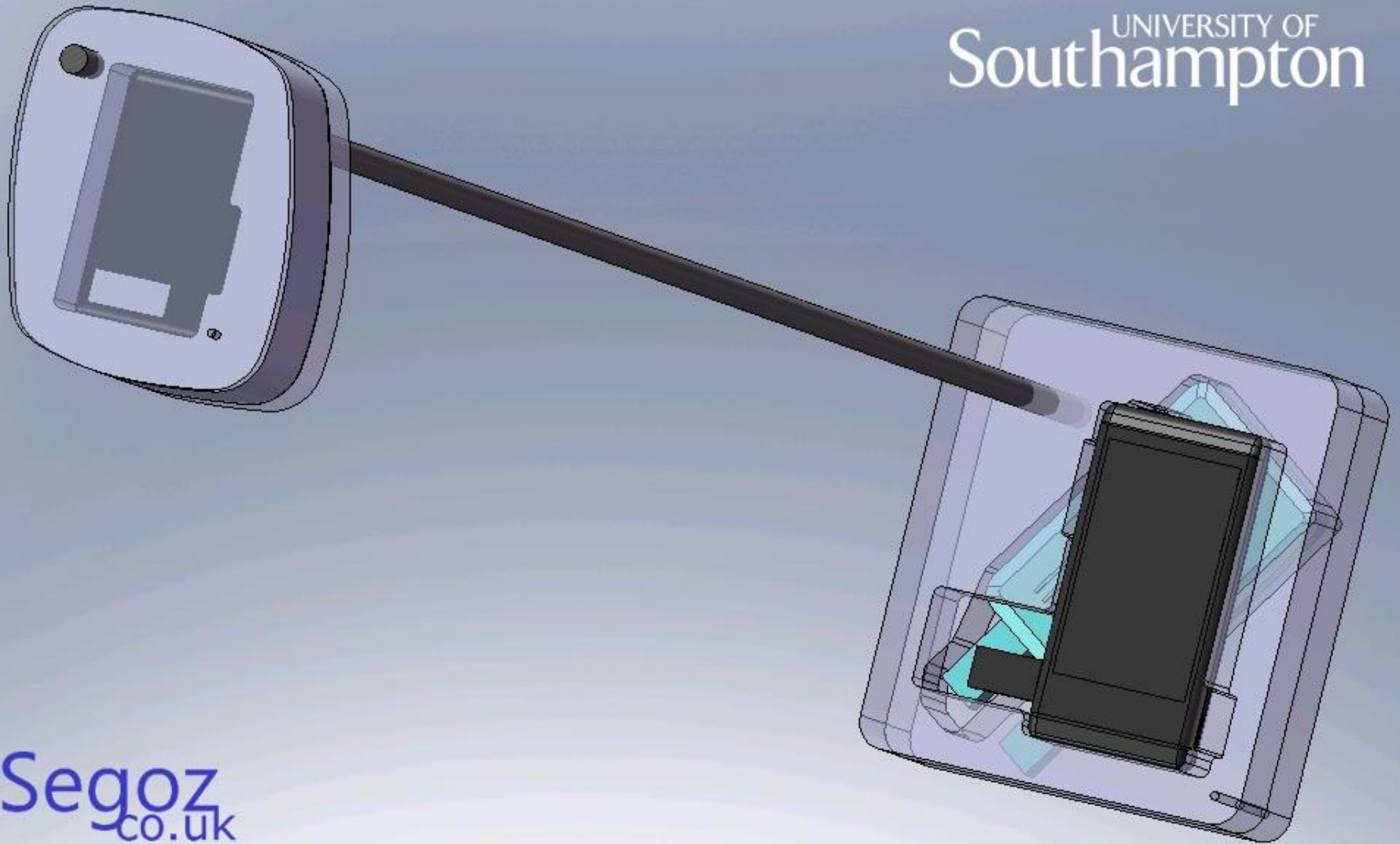
Ground station

Instruments launched on a balloon



Balloon bursts, Instruments descend on parachute







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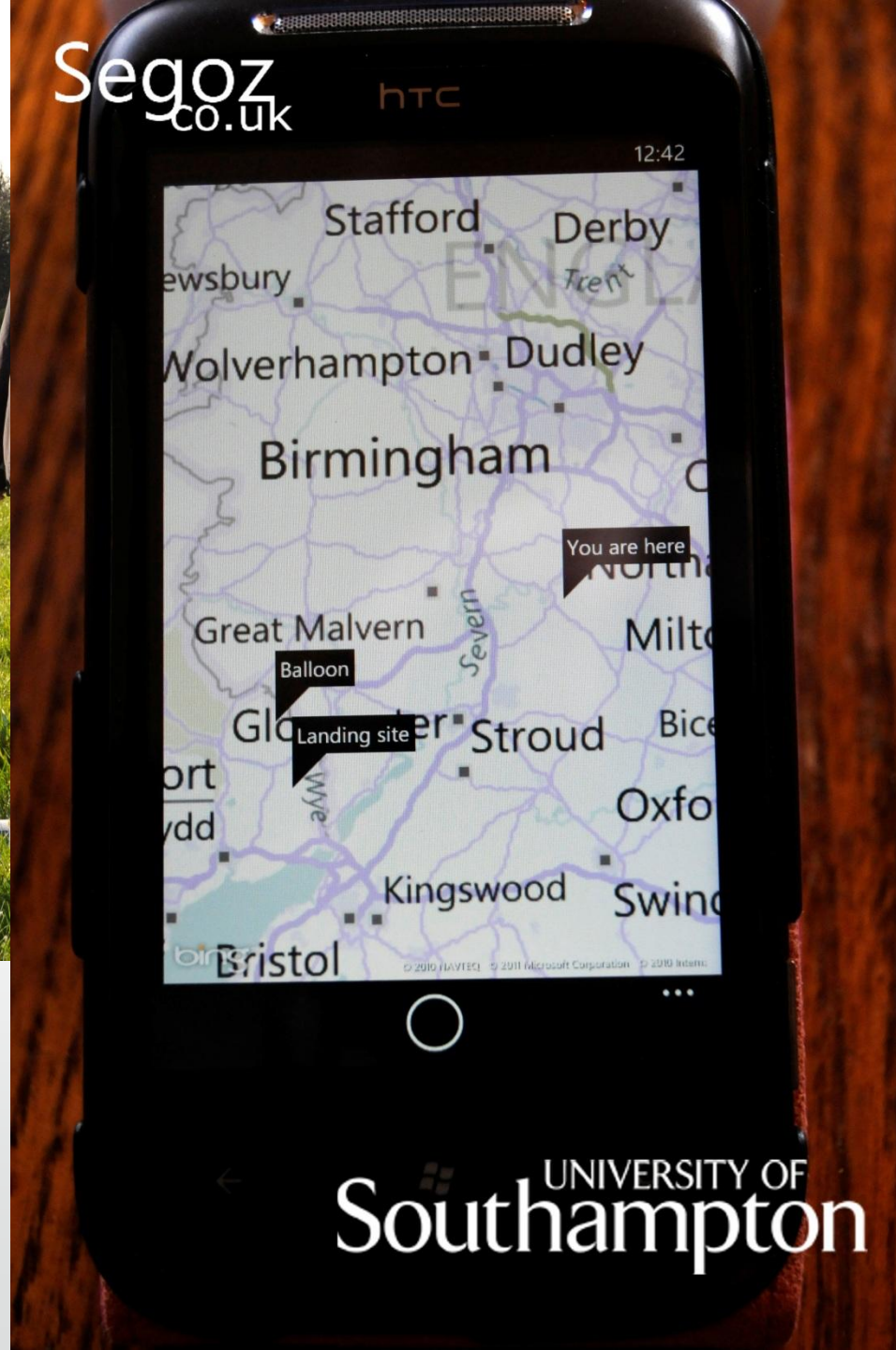


Segoz
co.uk

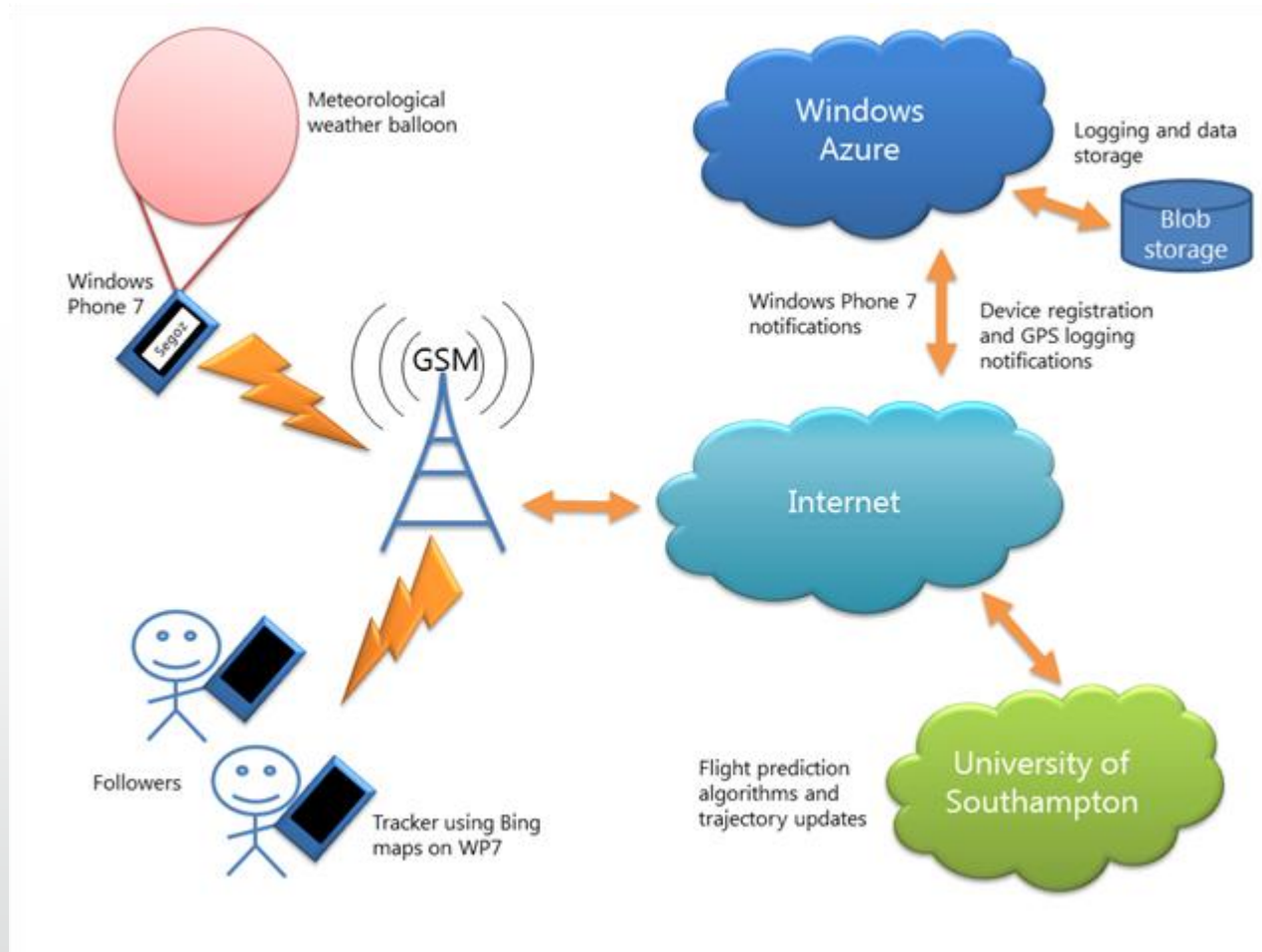
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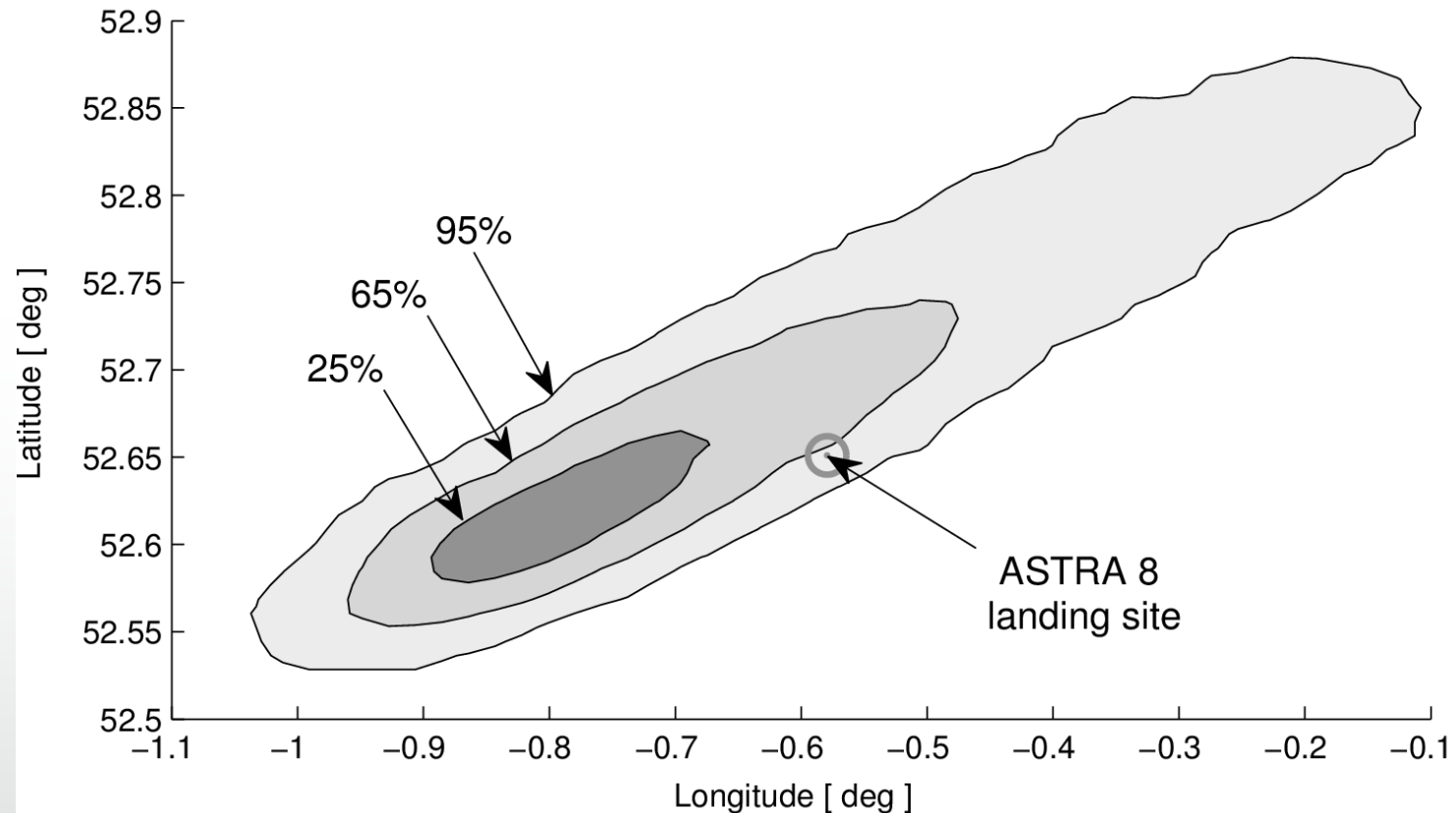
Segoz
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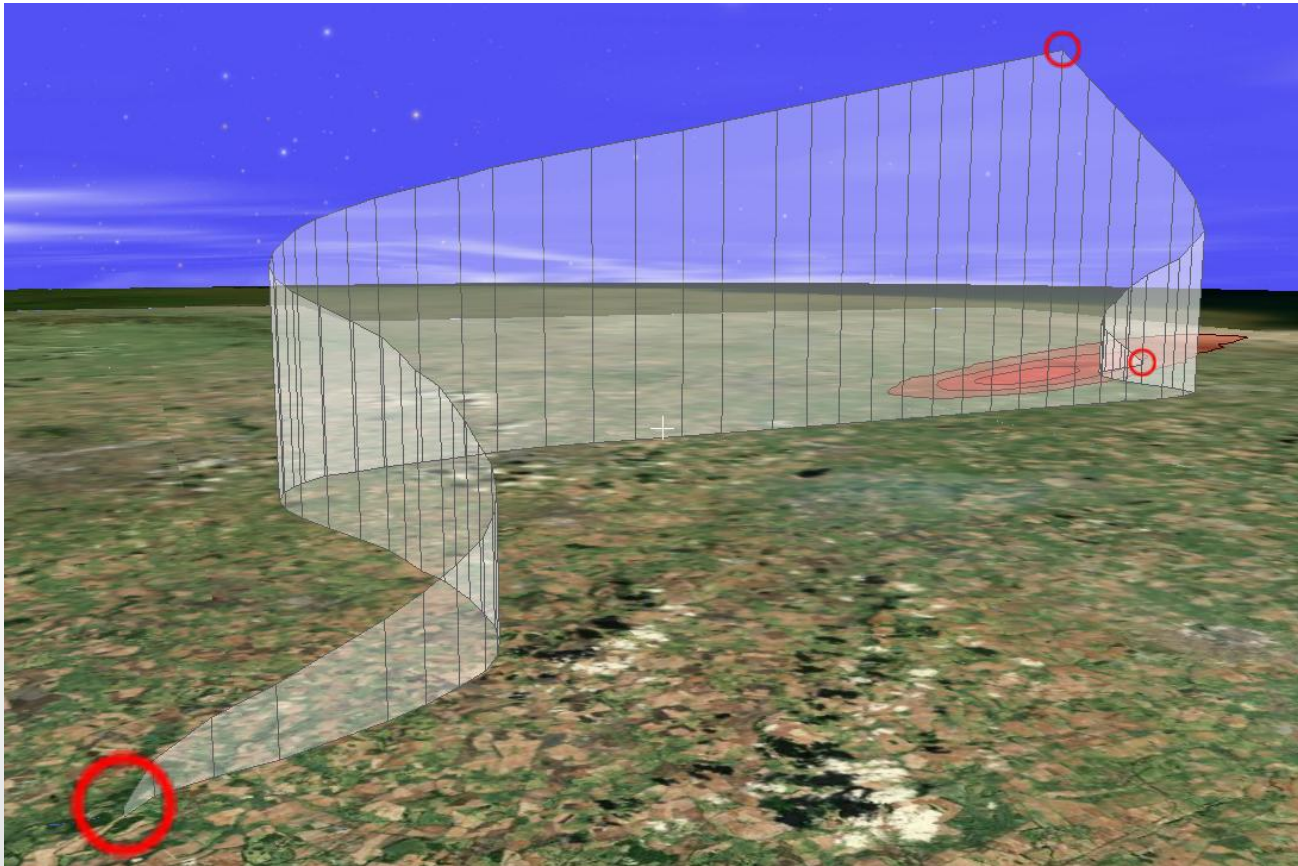
Cloud computing infrastructure



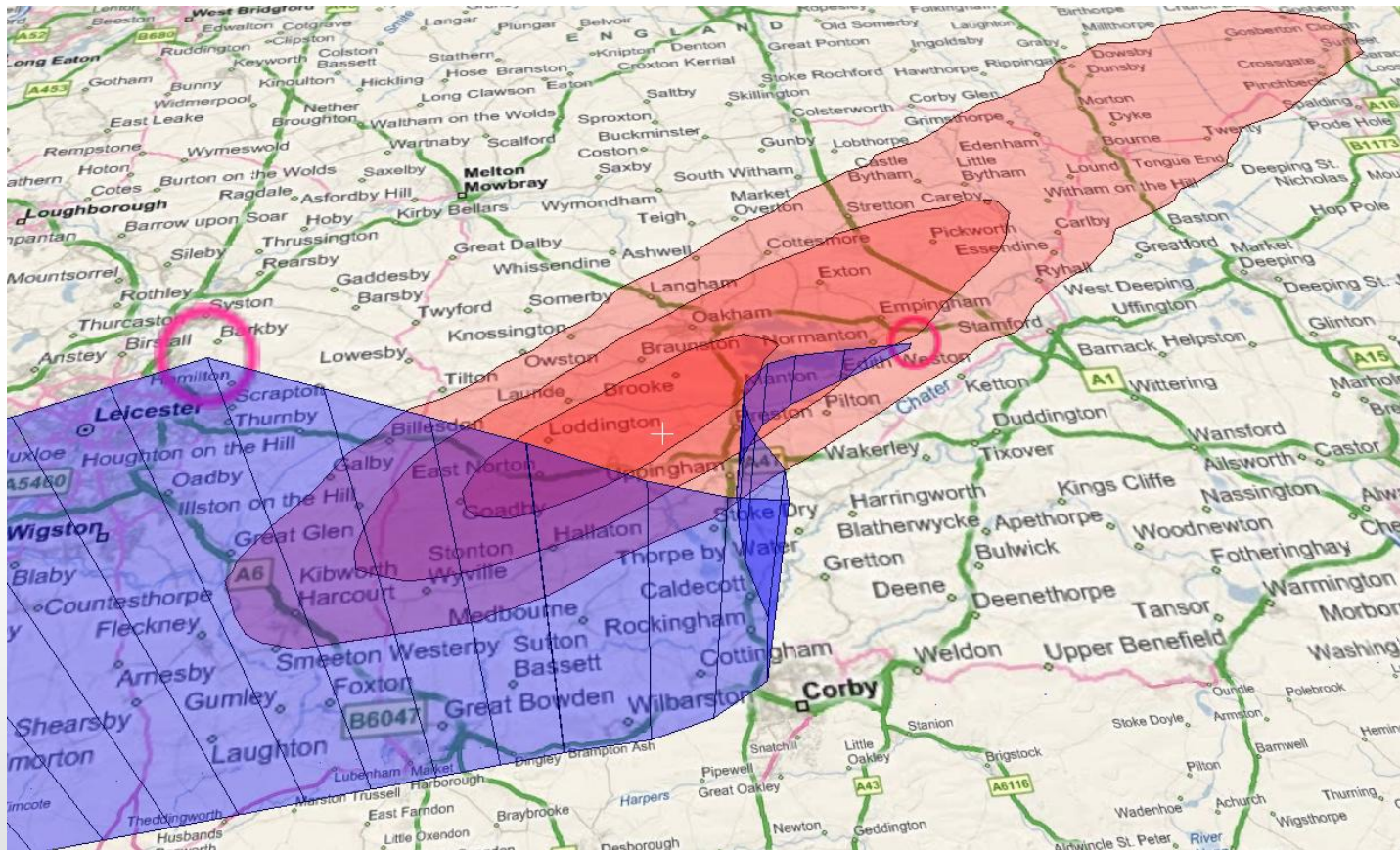
Landing 'ellipses'



ASTRA 8



ASTRA 8: Apogee and Descent

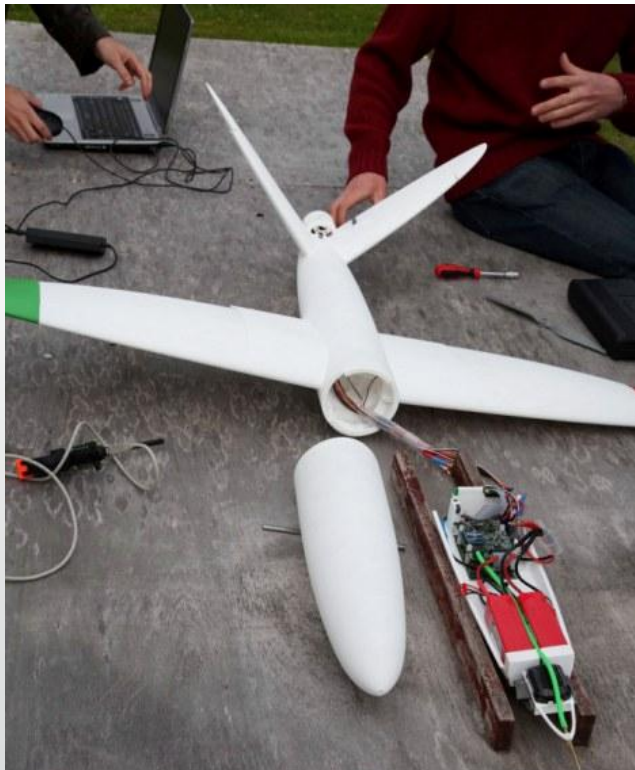


Rapid prototyping techniques for customized vehicle development



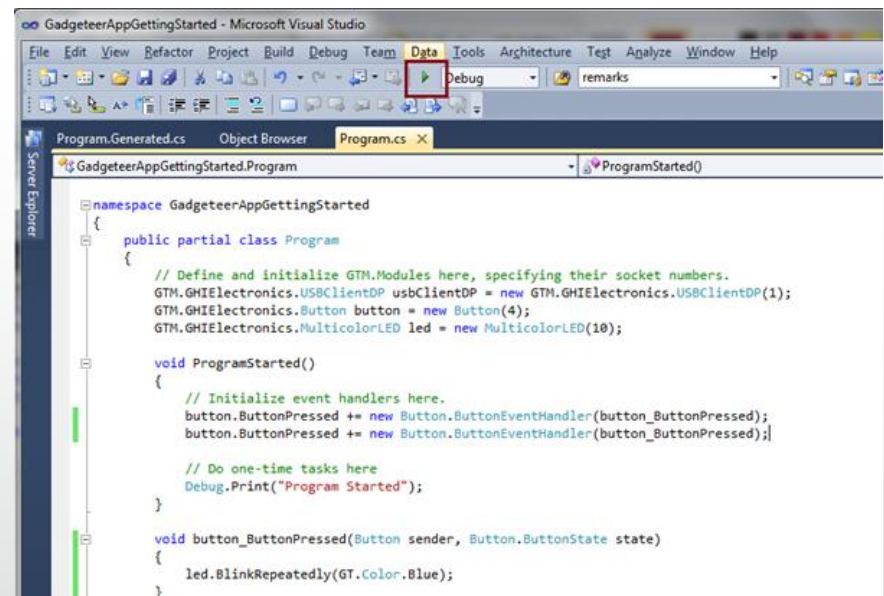
Rapid prototyping techniques for customized vehicle development

- Laser-sintered airframes



Rapid prototyping techniques for customized vehicle development

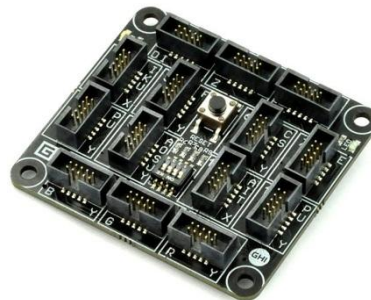
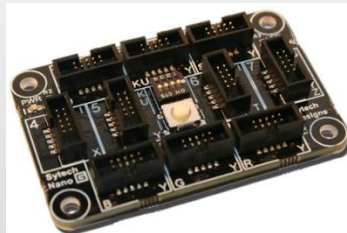
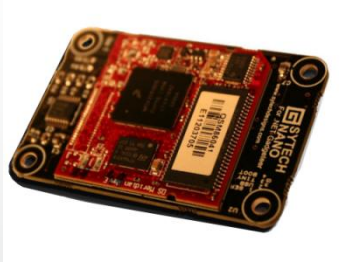
- Rapid sensor integration - .net Gadgeteer



The .NET Gadgeteer Hardware

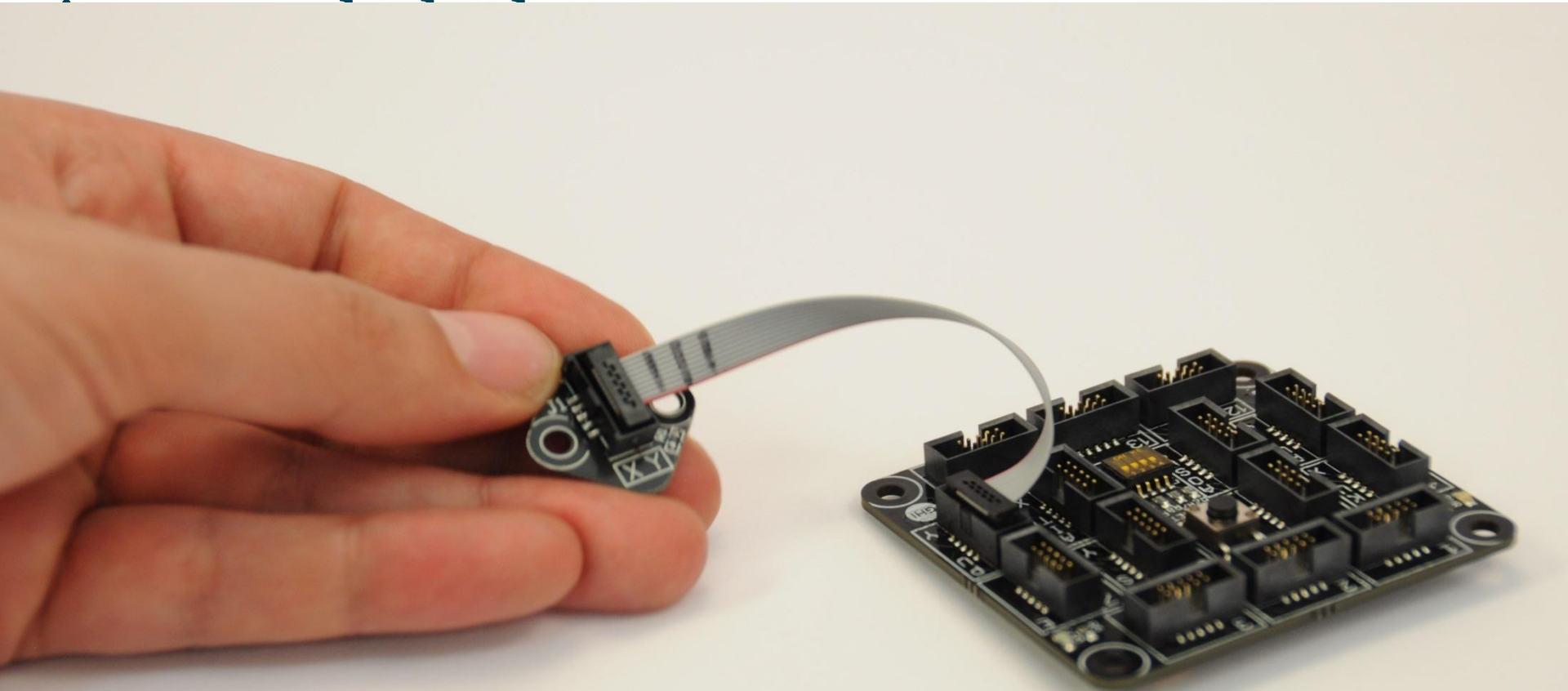
At the heart of every Gadgeteer project is a **mainboard**.

A mainboard is made up of a programmable processor, and a number of **sockets** that Gadgeteer **modules** can plug into.





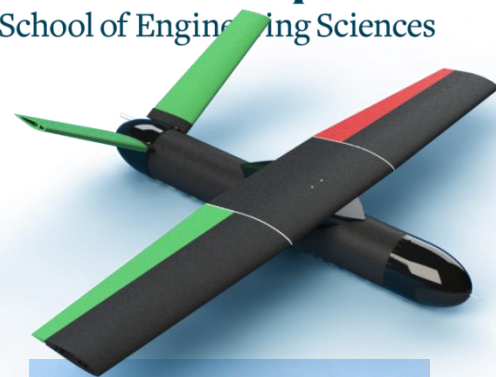
Connecting mainboards and modules:



e: The hardware will **not** be damaged if the wrong socket is us

BALUGA / ASTRA Cube

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Summary

- University of Southampton & Microsoft
 - ASTRA
 - Bizspark
 - .NET Gadgeteer
- Phone + Cloud + Rapid prototyping (3d/Electronic) for Science

Acknowledgments



See also...
www.soton.ac.uk/~astra

