

N8 AgriFood Doctoral Seminar

Precision Agriculture, Remote Sensing and Autonomous Robotics for Agriculture & Food



University of Manchester
D45B, Sackville Street Building, University of Manchester

Friday 15 February 2019

A unique series of informal, interdisciplinary workshops across the **N8 universities (Durham, Lancaster, Leeds, Liverpool, Manchester, Newcastle, Sheffield and York)** for PhD students from both the natural and social sciences. Join us in Manchester for the third in the series and gain new insights into the latest developments in precision agriculture and robotics.

10:00	Registration and Coffee	
10:30	Introduction	Professor Bruce Grieve , University of Manchester
10:45	Keynote - Electrodyn: Precision delivery ahead of its time?	Phil Wege , Syngenta In the early 1980's ICI developed a novel agrochemical spray delivery system. The Electrodyn sprayer used an electric field effect to generate charged spray droplets which were effectively deposited onto both exposed and hidden surfaces of the target plant, providing excellent control of insect pests or plant pathogens. The sprayer had many advantages over conventional hydraulic or other ULV spray systems: It had a very low energy consumption, used ultra-low application volumes, had no moving parts, avoided the need for product dilution and gave excellent efficacy from reduced application rates of products. Despite these significant advantages over the other agrochemical delivery technologies of the time, Electrodyn was ultimately unsuccessful. The presentation discusses the novel technology and examines the reasons for its lack of success
11:15	Robotic Solutions for Soft Fruit Production	Dr Greg Cielniak, Dr Nicola Bellotto , University of Lincoln The RASberry funding programme (Robotics and Autonomous Systems for Berry Production) aims to develop autonomous fleets of robots for the horticultural industry which is facing many challenges due to its reliance on manual labour. The first major objective is to support in-field transportation operations to aid and complement human fruit pickers, followed by applications such as plant treatment, yield forecasting and fruit picking. To achieve this goal, the project bridges several current technological gaps including the development of a mobile platform suitable for strawberry fields, software components for fleet management, in-field navigation and mapping, fruit perception and dexterous picking, long-term operation, and safe human-robot collaboration. RASberry is a collaboration between academia, robotics industry, and strawberry growers to cover multidisciplinary competencies required for a successful delivery of the project. In this talk, we will focus on the robotic technical capabilities required for soft fruit production with a special focus on human perception illustrated by early results achieved by our team.
12:00	1-1 targeted networking and colleague introductions	
13:20	Lunch (including demonstrations)	

AGENDA continues on next page

FIND OUT MORE!

- **Reflect on your practice as a researcher and develop research impact**
- **See some of the latest agri-robotics technology in action**
- **Find out the speakers' career paths and learn from their experiences**
- **Hone the transferable skills that will enable you to develop your career during and beyond the PhD, in both academic and other professional contexts**

The event is **FREE** to attend. But space is limited so be sure to register as soon as possible.

AGENDA *continued*

13:20	Lunch (including demonstrations)	
14:00	From cosmology to crops	<p>Sarah Bridle, Manchester / STFC</p> <p>What does astronomy have in common with agriculture? A surprisingly large amount, as exemplified by some of the projects coming out of the new STFC Food Network+ (led by members of N8 AgriFood). I will briefly overview my background in cosmology and the capabilities of the Science and Technology Facilities Council (STFC), and present some of the results from the first round of scoping studies funded by the STFC Food Network+.</p>
14:20	Translating biosensors from pharma to farm	<p>Chris Blanford, University of Manchester</p> <p>Biosensors, analytical devices that use biological materials to selectively recognise a target molecule, are a lucrative segment of the diagnostics sector. The archetype biosensor are blood glucose sensors. The University of Oxford start-up that developed these sold their work for about \$800M in the 1990s. There are technological and economic hurdles to applying the underlying principles to agritech sensing. Compared to the homeostatic regulation of pH, temperature and ionic strength of human blood, biosensors in agriculture face many more potential interferences. Compared to single-use test strips, agricultural biosensors need to be robust and long-lived. And compared to medical diagnostics, costs must be minimised in the production of commodity foods. This short talk will cover some recent highlights in agritech biosensor research, will provide some tips for spotting the best work among the deluge of scientific research in this area, and will include some personal perspectives of how a materials chemist made a foray into agrifood.</p>
14:40	Broad-leaf weed detection in pasture	<p>Dr Wenhao Zhang, Bristol</p> <p>Pasture is increasingly seen as crop, which when managed effectively can provide a healthy diet for livestock throughout the year. The presence of weeds lessens the nutrition within the crop, and if left unchecked will out-compete the grass. Weed control in pasture is a challenging problem that can be expensive and environmentally unfriendly. The Centre for Machine Vision at the Bristol Robotics Laboratory, in collaboration with SoilEssentials and Aralia Systems Ltd, proposed a computer vision and deep learning based method for recognition of broad-leaf weeds in pasture such that precision weed control can be achieved with reduced herbicide use.</p>
15:00	Coffee	
15:15	Becoming a Professional Engineer or Environmentalist with IAgrE	<p>Alastair Taylor, The Institution of Agricultural Engineers (IAgrE)</p> <p>Alastair Taylor MIAgrE, CEnv, IEng is the CEO of IAgrE, the professional body for engineers, technologists, and scientists working across agriculture, landbased industries and the environmental sectors.</p> <p>Alastair will talk about the multi-disciplinary nature of the industries served by IAgrE and look at the role of professional bodies. He will explain how IAgrE seeks to support your professional life through your knowledge, your standing and your network.</p> <p>In a world where knowledge is king, and professional bodies act as learned societies, the main focus is on bringing professional standing to people working in industry, research and academia. Alastair will explain how to become a registered professional with the Engineering Council and the Society for the Environment and cover the benefits of this status and the approach IAgrE uses to assess you as a professional</p>
15:45	Robots for Extreme Environments & Swarm Robotics (Demonstrations/ Visuals)	<p>Dr Simon Watson, University of Manchester</p> <p>Dr Farshad Arvin, University of Manchester</p>
16:30	Close	

REGISTRATION

Please register via EventBrite
<https://manchesterdoctoralseminar.eventbrite.co.uk>

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MORE INFORMATION

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