

IAgrE Landwards Conference 2019

Wednesday 30th October 2019
Peterborough Suite, East of England Conference Centre,
Peterborough PE2 6XE

Can Big Data lead to Smarter Farming?

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With thanks to the Douglas Bomford Trust for their support



Conference Programme

0930	Arrival, Registration and Networking – Post Graduate Poster Display
0945	Introductory Remarks – <i>Understanding the Big Data challenge and the opportunities this brings for farmers and the wider supply and support system. Looking at the engineering and technology challenges and opportunities.</i> - Professor Jane Rickson – President IAgrE
1000	The role of Big Data in unlocking unimaginable solutions to feeding the world and environmental protection – <i>Agrimetrics provides, connects and analyses complex data to drive greater productivity for agrifood businesses and deliver food sustainably. This session will explore how big data emerging from engineering/machinery-driven applications is transforming and has transformed other industries and therefore where there may be great potential for Agriculture.</i> Benjamin Turner, Chief Operating Officer, Agrimetrics
1020	How will Big Data Transform Agriculture – Practical Lessons from the Farm – <i>From Agronomist to Grain Merchant, Farm Manager to Machine operator, the role of data in shaping decisions and improving yields has moved on apace. This session will look at the work of agronomists and the emerging role of Precision Technology advisor and integrator. This session will focus on how the agricultural support network will link technology, knowledge and advice to deliver sustainable farming, linking Technology, Knowledge and Advice to Deliver Sustainable Farming.</i> Oliver Wood, Precision Technology Manager, Omnia Precision Agronomy
1040	The next generation CLAAS LEXION Combine Harvester – <i>How data collection can contribute to smarter farming. Optimising machine performance with continuous data access allowing the manufacturer to fine tune the machine “on the move” through simultaneous “access data” and “connectivity” and on board support. In addition, “data delivery” and “data reception” to or from other systems and decision making tools. These tools can be vehicle/fleet related or contribute to the classic precision farming approach enabling an operation to utilise input more effectively - the right amount, at the right place and time.</i> Dr. Joachim Stiegemann – CLAAS Product Management
1100	Coffee Refreshment Break – Post Graduate Poster Display
1130	IoT for Agriculture – <i>The opportunity is now presented for the agricultural industry to take a lead in defining an IoT structure for specific agricultural support that goes beyond the specification of technology and addresses the need for developing a framework for accommodating protocols, standards, the needs for operational governance and open systems infrastructure to assist global application and scalability. This session addresses these challenges and opportunity to realise an industry-lead IoT for Agriculture – an IoAT.</i> Anthony Furness MIAgrE - Visiting Professor, Harper Adams University
1150	Big Data: Changing the paradigm for small farms - <i>The UK is predominantly made up of small mixed farms, which present very different challenges to large arable farms. Luke Halsey of Farm491, the UK’s leading AgriTech incubator, will explore how big data represents an opportunity for smaller farms and how we can create value for farmers by providing valuable insights from data. From Luke’s experience working alongside AgriTech entrepreneurs he will discuss lessons learned and potential opportunities for smaller farms, as well as the importance of the business model to enable equitable farmer adoptions.</i> Luke Halsey – Farm491

Conference Programme

1210	<p>Digitalisation and Service Journey – the steps on the journey at CNH Industrial on the digitalisation of their machines and journeys.</p> <p>Filippo Fassino – Customer Contact Service Director CNH Industrial</p>
1230	<p>Panel Discussion: In light of this morning discussion, will data be the great panacea it is claimed to be? Will “big data” be as revolutionary as the tractor and mechanisation?</p> <p>Chaired by Andy Newbold FIAgrE – IAgrE Past President</p>
1315	Lunch & Networking – Post Graduate Poster Display

Parallel Workshops – Lessons from the Land

Time	Emerging Research and Policy Themes	On Farm Developments
1415	<p>Nick Starkey, Royal Academy of Engineering</p> <p>The role of the Royal Academy of Engineering in developing research and policy themes around emerging technologies which rely on the collection and application of “Big Data” in areas such as autonomous vehicles, drone technologies, data ethics and where the government should invest in digital technologies.</p>	<p>Arthur Soames, Hummingbird Technologies</p> <p>Developments in the use of Artificial Intelligence, imagery and data analytics from satellite, drone, plane, and robot technology, to provide farmers with high-resolution maps of their crops at critical decision-making junctions in the season. Using advanced machine learning and computer vision techniques, delivering actionable insights on crop health directly to the field.</p>
1445	<p>Ron Corstanje MIAgrE, Cranfield University</p> <p>The role of the UK Government Digital Champion. Developments in Agri-Informatics. The application of big data and data sciences to support grower decision making. Insights into research with multi-national Information Technology and Food manufacturers.</p>	<p>Mark Rutter, Harper Adams University</p> <p>Big Data and the Livestock Sector. How can Big Data be collected from the livestock sector? Sensor technologies and the animal including developments at Harper Adams. Thoughts on the ethical dilemmas of collecting data directly from animals.</p>
1515	<p>Rob Simmons MIAgrE, Cranfield University</p> <p>Development of a Soil Management Information System for Horticulture.</p> <p>The Climate Corporation and Gamaya already offer data-driven agricultural insights that take soil type, seed suitability and local weather patterns into account.</p>	<p>Simon Pearson FIAgrE, Lincoln University</p> <p>The use of Big Data to support autonomous systems and agri-robots. Overview of developments with the Universities of East Anglia and Cambridge.</p>
1545	<p>Conference Review</p> <ul style="list-style-type: none"> <i>Review of Conference and Next Steps</i> 	
1600	End of Conference	

Can *Big Data* lead to Smarter Farming?

How is Big Data improving agricultural practices

IAgrE President 2018-20

Professor Jane Rickson CEnv FIAgrE



Jane Rickson is Professor of Soil Erosion and Conservation in the Cranfield Soil and AgriFood Institute, School of Water, Energy and Environment at Cranfield University. She holds qualifications in agricultural and biosystems engineering at MSc and PhD level. She has over 30 years' experience of research, consultancy and teaching in soil and water engineering, with focus on sustainable land management practices. She is a Fellow of the Institution of Agricultural Engineers, a Chartered Environmentalist, Fellow of the Higher Education Academy and member of the Institute of Professional Soil Scientists.

Agriculture has gone through many revolutions in the past: hunter gatherers becoming settled farmers, the introduction of mechanisation (horses replacing tractors) and improvements in crop breeding ("The Green Revolution")....Many people say we are on the verge of the 4th Revolution, where data drives decisions on agricultural production and processes. Our Annual Conference will explore whether the Revolution is imminent and what are the implications of 'big data' for future farming and land based industries?"

Welcome to the Institution of Agricultural Engineers Annual Conference 2019. This year our theme is all about whether 'big data' can address challenges faced by agriculture and other land based industries today and into the future. For example, food security: can we use big data techniques to increase agricultural productivity to meet the ever growing demands for food, fodder, fuel and fibre, without damaging our precious resources of soil, water and air? What benefits can big data bring to farmers, the wider supply chain and agricultural support services? Our ability to collect, collate, analyse and interrogate data collected from 'field to fork' is growing rapidly, thanks to new technologies such as environmental sensors, hardware and software developments, and better IT skills. But are we making the most of these innovations? Are we learning from other industries? What needs to be done to realise the potential of big data in agriculture and the land based industries?

I hope you enjoy the conference and that you find it informative and even inspiring!



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Benjamin Turner Chief Operating Officer, Agrimetrics



Benjamin leads data and operations for Agrimetrics, one of the UK's four AgriTech Centres. Agrimetrics's mission is to catalyse the UK agrifood sector through the power of big data and advanced analytics. Benjamin's team is creating a platform business upon which anyone can create data products and services for the market.

Previously Benjamin has created the data strategy and led the building of data capabilities in various industries including FMCG, professional services, media and hospitality. Benjamin is a chemical engineer by training and is a Chartered Engineer.

***Big Data: Hype or Reality?** Agrimetrics provides, connects and analyses complex data to drive greater productivity for agrifood businesses and deliver food sustainably. This session will explore how big data emerging from engineering/machinery-driven applications is transforming and has transformed other industries and therefore where there may be great potential for Agriculture. Benjamin will discuss breaking down the barriers to sharing and using data across the industry.*



Oliver Wood, Precision Technology Manager Omnia Precision Agronomy

Oliver joined H L Hutchinson Ltd as Precision Technology Manager, where his role is to manage the company's precision agronomy services. His main area of responsibility is the on-farm delivery and continual development of our in-house Omnia precision agronomy platform. Alongside this, he has responsibility for the development of complementary services, like the iPad variable rate control system Connect, and the soil scanning service TerraMap.

Oliver graduated in 2005 from Harper Adams with a 2:1 honours degree in Agriculture with Mechanisation and then joined John Deere as a precision farming specialist and then moved to other roles within the business. This then led to a role with a precision farming services company for a number of years. He then took a break from precision farming and worked abroad for two years managing an oil palm plantation in Papua New Guinea before returning to the UK to join Hutchinsons in 2014.

***How will Big Data Transform Agriculture – Practical Lessons from the Farm** – Farmers have an abundance of data around them, whether that is being generated from their machinery, paid for services like soil mapping, or the wealth of knowledge that is in their own heads. But there is a lack of clarity about how to use all of this information and they are increasingly turning to their agronomist to advise them on what it all means and how to leverage it to increase on-farm profitability in a sustainable way. Omnia, which is the precision farming platform offered by Hutchinsons, allows farmers and agronomists the ability to bring all of spatial data together into one place, irrespective of its origin, and then use it in practical and tangible ways.*



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Dr Joachim Stiegemann Product Manager, CLAAS

Dr Joachim Stiegemann was brought up on a farm in Northern Germany, and in 1980 decided to study agriculture sciences at the University of Goettingen, Germany. He graduated in 1986 with a postgraduate scholarship at the Institute of Soil Science/Division Soil Physics, and in 1990 was awarded a PhD in Soil Science and employment as an academic councillor at the University of Goettingen.



In 1991 he changed direction, joining TMI Training and Consulting in Stuttgart and Munich, and in 1996 was employed by RWTÜV Systems Engineering/Certification. He has worked for CLAAS in various positions since 1997 at the headquarters in Harsewinkel/Germany and then Omaha, NE. Between 2015-2018 he was Head of Product Management CLAAS E-Systems, and since October 2018 Head of Product Management PU A LEXION combines.

The next generation CLAAS LEXION Combine Harvester - How data collection can contribute to smarter farming. Optimising machine performance with continuous data access allowing the manufacturer to fine tune the machine "on the move" through simultaneous "access data" and "connectivity" and on board support. In addition, "data delivery" and "data reception" to or from other systems and decision making tools. These tools can be vehicle/fleet related or contribute to the classic precision farming approach enabling an operation to utilise input more effectively - the right amount, at the right place and time.



Anthony Furness, Visiting Professor, Harper Adams University

A Consultant Practitioner and Chartered Engineer with academic and business interests in automatic identification and data capture (AIDC), object-connected ICT and engineering applied to agriculture, food security, climate change and planetary boundaries. Current activities in automatic identification focus on the Internet of Things (IoT) applied to agriculture, based on over twenty years' experience in the AIDC technologies.

He has been involved, often in a lead role, in specifying and delivering numerous AIDC-related national and European projects, including Technical Coordinator in two EU projects concerning object-connected technologies and the Internet of Things. Current interests in engineering are concerned with Research into electromagnetic interaction with biological systems in relation to agriculture, food security and planetary boundaries. These interests are currently being pursued through a Visiting Professorship with Harper Adams University (HAU), Engineering Department, and the National Centre for Precision Farming (NCPF) hosted by HAU.

IOT for Agriculture – The opportunity is now presented for the agricultural industry to take a lead in defining an IoT structure for specific agricultural support that goes beyond the specification of technology and addresses the need for developing a framework for accommodating protocols, standards, the needs for operational governance and open systems infrastructure to assist global application and scalability. This session addresses these challenges and opportunity to realise an industry-lead IoT for Agriculture – an IoT.



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Can *Big Data* lead to Smarter Farming?

IoT for Agriculture – Presentation Summary

Despite twenty years of technological progress, Internet developments, a plethora of IoT studies, governmental reports, white papers, commercial enterprise, and some 8 billion objects being connected to the Internet, the Internet of Things (IoT) still remains a nebulous, poorly-defined structure in real terms, far from realising the potential that the concept offers. Ambiguity, confusion and hype still emerges in discourse on the IoT concept and its realisation as a platform for addressing regional, national and global challenges. A 2019 invitation by UK government for consultation on proposals for the regulation of the Internet of Things (IoT)¹, clearly suggests that such a network exists, but does it? Elements most certainly. Internet-supported applications pervade, largely characterised by computer-to-computer communications and access to services provided within the application layer of the Internet protocol stack.

Morphing of the IoT concept into many forms and interpretations, with foci on specific areas of interaction, such as Internet of People, Industrial Internet of Things, Internet of Agri-Things and Internet of Food Things have sought to give greater definition to IoT capability. An increasing number of major IT companies contributing to the technologies, IoT architecture and systems, has extended the building blocks for structuring the IoT initiatives. Identifiers, sensors, actuators, data structures, communication and connectivity technologies, with associated protocols and standards are there to realise effective solutions and realise the promise that the concepts of IoT provide for ubiquitous object identifiers, connectivity and innovative functionality. Unfortunately, there appears to be a general lack of collective motivation to take the IoT concepts and meld them into operational infrastructures that can serve global needs and address global challenges. A possible exception here can be seen in social media developments and smart phone connectivity. However, with regard to agriculture and food, the realisation of IoT potential is far from optimal, especially with regard to the very significant challenges of food security, the environment, climate change and the related planetary boundaries², and moves to a circular economy. Network definition and governance, coupled with authoritative representation, are arguably required to realise structures that can address these specific global challenges. A UK governmental review (Blackett Review) in 2014 on the IoT, with evidence from the agriculture sector, followed by a workshop to develop proposals for an ‘Internet of Agri-Things’ as yet to yield a practical realisation of those proposals, yet the need is now even greater.

Governance can be seen to be particularly significant in progressing these IoT-specific developments³, but sadly deficient in the process of realisation. Governance, considered in terms of the framework and tools it can provide for facilitating defined goals, focused upon exploiting physical world connectivity and communications, provides the guiding principles for consolidating, managing and delivering structures that can, through local, regional, national and international routes, address global challenges. Advantage may also be seen in accepting the need for a legal framework based upon ‘soft law’ formulations derived essentially through self-regulation. Considerations for governance can benefit from the multidisciplinary approach provided by Internet governance bodies,

¹ <https://www.technologylawdispatch.com/2019/05/regulatory/uk-government-consultation-on-the-internet-of-things/>

² The planetary boundaries² include, *climate change, land-system changes, fresh water usage, bio-geochemical flows, biosphere-integrity, ocean acidification, stratospheric ozone depletion, atmospheric aerosol loading and the introduction of novel entities.*

³ Furness, A (2012) Foundations for IoT Governance, The Internet of Things 2012 – New Horizons, IERC – Internet of Things European Research Cluster Book (3rd Edition), 204-248. ISBN 978-0-9553707-9-3.

wherein technical, policy, economic, institutional and legal issues can be addressed. The range of stakeholder interests need to be accommodated in an appropriate model or framework.

With regard to authoritative representation, and in the absence of direct governmental control, some inroads may be seen in the collaborative efforts to establish an Internet of Food Things (IoFT), supported by the EPSRC-funded Internet of Food Things Network Plus. In considering inhibitors to greater digital collaboration, governance is seen as central in terms of collaboration on technological and social issues. In recognising the capability of a governance framework and tools (co-operation, policy co-ordination, standards, regulations, law) it can be seen as an effective platform for addressing both collaboration and the identified grand challenges and the wider food security challenges. Bringing governance to the fore may also be seen as the key to realising an Internet of Agri-Things that suitably specifies the necessary networks, network interactions and associated infrastructure to meet challenge needs – specified by the agricultural stakeholders.

With data volume now gaining such prominence in agricultural developments, the accommodation of Big Data concepts and their implementation, almost demands a governance attribution to fully understand and control big data issues, including the major shifts in mind-set to appreciate the differences in conventional and big-data approaches and the economic, commercial, regulatory and operational implications of big data applications.

The opportunity is now presented for the agricultural industry to take a lead in defining an IoT infrastructure for specific agricultural support that goes beyond the specification of technology and addresses the need for developing a framework for accommodating protocols, standards, the needs for operational governance and open systems infrastructure to assist global application and scalability. Moreover, the opportunity is presented for developing a stakeholder platform for influencing the collective issues and decisions that decide the future of IoT technologies in agriculture and its associated sectors of primary food production and protection of the environment.

This session addresses these challenges and opportunity to realise an industry-lead IoT for Agriculture – an IoAT.

Anthony Furness - Visiting Professor, Harper Adams University

The views expressed are those of the author alone and do not necessarily reflect the views of Harper Adams University or other institutions.

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Luke Halsey Head of Farm491

Luke leads Farm491's incubation work, supporting companies in the agri-food tech space to achieve their full growth potential as well as building partnerships and research initiatives to help grow the UK's AgriTech ecosystem. Luke is also Investment Director for California based fund AiiM Partners.



Luke has over 10 years' experience with environmental and social impact orientated businesses. This includes deep investment experience having worked in California on high impact portfolios around climate change solutions across agrifood, energy and oceans. He has also been involved in numerous research projects focused on breaking down barriers to adoption of innovation in the UK and U.S. to solve some of the biggest global social and environmental problems.

Big Data: Changing the paradigm for small farms – *The UK is predominantly made up of small mixed farms, which present very different challenges to large arable farms. Luke Halsey of Farm491, the UK's leading AgriTech incubator, will explore how big data represents an opportunity for smaller farms and how we can create value for farmers by providing valuable insights from data. From Luke's experience working alongside AgriTech entrepreneurs he will discuss lessons learned and potential opportunities for smaller farms, as well as the importance of the business model to enable equitable farmer adoptions.*

Filippo Fassino

Customer Service Director, CNH Industrial



Filippo Fassino is the Global Customer Contact Centre – AG Service Contracts Director for CNH Industrial. Mr. Fassino's primary responsibilities encompass leading the Customer Contact Centres for all CNH Industrial Brands, and managing Maintenance Contracts and Extended Warranty Services for the Agricultural Segment of CNH Industrial. He also coordinates the implementation of the aftermarket digital stream for the Agricultural Segment. Since joining the company in 2006, Filippo Fassino has held positions of increasing responsibility in the Aftersales business in the Commercial Vehicles and Agricultural Equipment segments. Mr. Fassino holds a degree in Automotive Engineering from the University of Turin, Italy.

Digitalisation and Service Journey – *the steps on the journey at CNH Industrial on the digitalisation of their machines and journeys*



Can *Big Data* lead to Smarter Farming?

Panel Discussion chaired by

IAgrE Past President

Andy Newbold CEng FIAgrE

Andy publishes *Precise* magazine, focused on practical implementation of technology in agriculture, he is a Chartered Agricultural Engineer, a Fellow of the Institution of Agricultural Engineers and a former president of the Institution.



If you have a question that you feel will stimulate discussion please do make a note and hand it to Andy prior to the forum.

Speakers taking part in the discussion:

Jane Rickson, President IAgrE

Benjamin Turner, COO, Agrimetrics

Oliver Wood, Precision Technology Manager, Omnia Precision Agronomy

Joachim Stiegemann – Product Management, CLAAS

Anthony Furness, Visiting Professor, Harper Adams University

Luke Halsey, Head of Farm491, Royal Agricultural University

Filippo Fassino, Customer Contact Service Director, CNH Industrial



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Lessons from the Land: Emerging Research & Policy Workshop

Nick Starkey, RAEng Director of Policy



Engineering, Policy Food & Data - The need for engineering expertise to inform policy making has never been more acute. Almost all of the issues facing policy makers today from climate change to housing, cyber security to health care, are complex systems problems often with a technical edge. Engineers are natural systems thinkers, with an ability to define a problem, marshal evidence, trial solutions and make connections, and they have a huge amount to contribute to the design and delivery of policy for the public good.

It is for this reason that the Royal Academy of Engineering has collaborated with the other 38 major professional engineering institutes to form the National Engineering Policy Centre. The Centre is a vehicle through which we can reach across organisational and professional silos to take a systems approach to policy issues with an engineering element.

IAgrE is an important and influential part of that alliance. Through the Policy Centre we are together informing the consultation on a National Food Strategy. We have a digital topic group which keeps abreast of the developments in data and digital – itself a branch of engineering - and their implications for other parts of engineering. And we are currently undertaking a major project on the Safety and Ethics of Autonomous Systems, learning specifically from the different early experiences of autonomy in agriculture, air and marine contexts and in other applications such as social media and healthcare. The discussion will explore these topics and the role of the engineering in public policy.



Ron Corstanje Professor of Environmental Data Cranfield University

Ron's research programme embraces the development and application of modelling, informatics and statistical methods to current problems in soil science, agriculture and the environmental sciences, ranging from fundamental methodological developments, to their application in these fields.

His current research programme at Cranfield University integrates spatial temporal models with environmental and ecological data, from climate-driven modelling, hydrological modelling, to ecological modelling. A recurrent theme throughout is scale, scale effects and scaling of processes and process model understanding, developing and integrating measures of uncertainty and its communication. His work is policy relevant, as to which statistical techniques are developed and considered for soil quality health monitoring, the resilience of natural systems and the importance of natural capital in agriculture, the development of infrastructure and in urban ecology.

Please turn over ...



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Emerging Research & Policy Themes continued

Professor Corstanje is currently programme Champion for the NERC programme Constructing an Digital Environment; championing a £10.5 M program on developing digital solutions for the natural environment.

Ron also leads the Centre for Environmental and Agricultural Informatics (CAEI). CAEI specialises in the development of transformational informatics technology, integrating data gathering and monitoring technologies (sensor tech), data manipulation and interpretation (informatics and data sciences). CAEI includes research on air quality and climate change, soil quality, crop growth and monitoring, natural capital, ecosystem goods and services and on urban systems. In this way, CAEI articulates the benefits and findings from the data collected, providing a whole system approach to agricultural and environmental informatics.

Rob Simmons

Reader in Sustainable Soil Management Cranfield University

Dr Rob Simmons is a Reader in sustainable soil management. Rob is an applied soil scientist with >25 years' experience of sustainable soil management founded on a robust understanding of the associated processes.



Rob has an extensive research portfolio and has been PI or Col on >14 BBSRC, NERC, Innovate UK, Environment Agency, WRAP and AHDB funded projects with funding totalling over £3 million in the last 7 years. This portfolio has focused on mitigating diffuse pollution through applied soil conservation options (grassed water way design, filtersocks, companion crops, mulches), optimizing whole farm 'big data' use, controlling splash detachment and structural sealing through polymer-based solutions and increasing understanding of soil management challenges in high value horticultural crops.

Rob's recent research has investigated the effect of rainfall-induced structural sealing on the hydrological response of the soil surface. He also has 10 years practical experience of soil management in Southeast and South Asia with 7 years at the International Water Management Institute (IWMI). Rob's research overseas included modelling the off-site impacts of Cd-contaminated sediments on paddy systems and impacts on human health, phytoremediation of Cd, and assessment and mitigation of diffuse pollution in South and Southeast Asia.

The Soil Management Information System (SMIS) developed under AHDB project CP107D is an intuitive, relatively easy to use, web-based tool that was developed to improve the productivity and competitiveness of UK horticulture. SMIS outputs support data-driven decisions on sustainable soil management. The database covers over 80 crop types, over multiple years within a cross rotational context, from a range of geographical locations across the UK. By including whole farm rotations, crops from other AHDB sectors are adventitiously included too such as cereals, oilseeds and potatoes. Currently there are over 325,000 grower data records that can be interrogated within SMIS. Novel agri-informatics approaches have been used to create, develop, operate and interrogate SMIS. The project has demonstrated that the principles of 'big data' can be applied to the diverse and dispersed sources of soil management data, knowledge and information in the UK horticultural sector.



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Lessons from the Land: On Farm Developments Workshop

Arthur Soames Head of UK Sales, Hummingbird Technologies



Hummingbird Technologies was a finalist in Agri-Innovation Den in 2017 and as business development director Arthur Soames says, the process helped build relationships with key industry experts.

He says: "Our mission as a business is to harness the power of artificial intelligence and machine learning techniques to help farmers make more informed decisions. This involves helping them target their inputs, maximise their yields and minimise their ecological impact. For example, on a macro level we use satellite imagery to assess how much nitrogen oilseed rape crops need and if they require plant growth regulators. We diagnose fields remotely and provide a recommendation, which can be a flat or variable rate applications map."

Hummingbird Technologies are working on early disease detection which requires ultra-high-resolution imagery and hyper spectral imagery to detect disease markers which are present before the disease is visible to the naked eye.



Mark Rutter Professor of Applied Animal Behaviour Harper Adams University

Mark's current research is focussed on how an understanding of the natural behaviour of domestic cattle can help improve their production efficiency as well as their welfare. This includes an interest in domestication and the evolutionary basis of behaviour. He is also interested in the role that precision livestock technologies can play in promoting sustainable livestock production.

Although the increasing use of livestock sensors on commercial farms is generating ever larger amounts of data, the full potential of these is not yet being realised. This presentation considers the challenges and opportunities associated with making better use of livestock 'big data' for a number of key stakeholders, including farmers, processors, retailers and consumers. Better data integration has the potential to improve production efficiency, reduce the environmental impact as well as enhance animal welfare in livestock production systems. Data sharing has the potential to add value to livestock products, share this more equitably through the supply chain, and help provide more robust assurances to the consumer.

Please turn over ...



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On Farm Developments Workshop continued

Simon Pearson

Director of LIAT, University of Lincoln

Professor Simon Pearson is the Director of the Lincoln Institute of Agri-Food Technology (LIAT), which sits within the College of Science at the University of Lincoln.



As Director of LIAT Simon helps develop and run cross disciplinary research projects on behalf of the agri-food sector. This includes a large focus on the use and deployment of agri-food robotic systems, including robotic crop harvesting and food processing systems, use of autonomous vehicles in the agri-food sector, the application of actuators within agri-food robotic systems.

Simon's research interests include; a diverse range of agri technology applications including robotic systems, automation, energy control and management, food safety systems and novel crop development. The environmental physiology of fresh produce and ornamental crops, including impacts on crop quality and development. Post-harvest physiology of vegetables, fruits and cut flowers, including the use of modified atmosphere packaging. The effects of light manipulation on crop growth and development, including the development and application of greenhouse spectral filters and LED lighting systems. The development of on farm decision support systems from remote sensing information. The development of pre and post farm gate supply and demand forecasting systems.

Prior to joining Lincoln, he was the CEO of a large UK farming company, worked for Marks and Spencer plc in a technical role and as a scientist at the University of Reading.



Are you a Member of IAgrE?

If not then we are looking for people just like you.

Agricultural Engineering is a very diverse profession and we have members representing every aspect of the industry, which makes IAgrE such an exciting professional Institution.

We run Conferences, Technical Talks, Branch Meetings and visits and are represented at industry events throughout the year. We ensure our members are represented across the industry and that their interests are at the forefront of government policy.

Join the Institution of Agricultural Engineers and enjoy all the benefits of networking across our fascinating and innovative industry.

Membership starts from £50 per annum and Students join for FREE (DBT Trust Sponsored)

To find out more contact Alison, our Membership Secretary membership@iagre.org or visit iagre.org to see how you can get involved.



IAgrE Landwards Conference 2019

Wednesday 30th October 2019
Peterborough



Delegate Feedback Form

We would like to thank you for attending our Conference today:

Can *Big Data* lead to Smarter Farming?

To assist us in maintaining or improving the quality and content of our events, the organising committee would be grateful if you could spend a few minutes to provide feedback on the points listed below by rating the event from 1 (poor) to 5 (excellent).

Any additional comments that you may like to make, or suggestions for future topics, can be added in the space provided below.

*Member/non-Member *please delete as appropriate

Please circle below as appropriate 1 = Poor to 5 = Excellent

- | | | | | | |
|---|---|---|---|---|---|
| 1. Did the conference meet your expectations? | 1 | 2 | 3 | 4 | 5 |
| 2. Level of technical content | 1 | 2 | 3 | 4 | 5 |
| 3. Quality of presentation (inc. audio/visual aids) | 1 | 2 | 3 | 4 | 5 |
| 4. Did the Conference increase your knowledge of the subject? | 1 | 2 | 3 | 4 | 5 |
| 5. Question & Answer and interaction | 1 | 2 | 3 | 4 | 5 |
| 6. Suitability of venue (inc. location, amenities etc.) | 1 | 2 | 3 | 4 | 5 |

Additional Comments:

On completion please leave at the desk on your way out or return by email to: secretary@iagre.org

Or mail to: Sarah McLeod, Conference Secretary
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Delegates & Speakers

Gbemisola	Alegbeleye	Cranfield University
Alex	Ansell	Cranfield University
Ruth	Bailey	AEA
Adrian	Baker	Parrish Farms
James	Bennett	Warwick University
Chris	Biddle	Editor Landwards Journal
Clive	Blacker	Precision Decisions
Malcolm	Carr-West	
Xin	Chen	Harper Adams University
Charles	Cooper	
Nicolas	Corker	
Ron	Corstanje	Cranfield University
Andrew	Court	
Hugh	Crabtree	Farmex Ltd
Linsey	Cresswell	Chap Solutions
Anna	Crockford	BASF
Frederick	Davies	Harper Adams University
Nikeshia	Davis-Shanks	City Farm Systems
Ian	Duff	
John	Elliott	JCB
Craig	Erskine	
Bob	Evans	Anglia Ruskin University
James	Evans	John Deere
Filippo	Fassino	CNH Industrial
Matthew	Foster	CNH Industrial
Adam	Fryer	Farm Electronics
Anthony	Furness	Harper Adams University
Philip	Griffiths	
Sam	Grimsdell	Syngenta
Luke	Halsey	Farm 491
Ed	Hansom	CEO IAgrE
Adam	Hayward	CLAAS UK
Paul	Hemingway	Lawn Farm
Harry	Henderson	AHDB
Ed	Hodson	Grimme UK Ltd
Godwin	Idoje	London South Bank University
Bharath	Jayakumar	Robert Bosch Ltd
Alex	Keen	
Brian	Knight	Willow House
Richard	Larke	Vantage England & Wales
James	Lee	Produce Solutions
Rob	Merrall	Merralls Consulting

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