



# Internet of Food Things Network Plus

## Internet of Food Things Network Plus

Overview of the 3-year EPSRC project

### Summary

The Internet of Food Things project is funded by a £1.14 million grant from the Engineering and Physical Sciences Research Council (EPSRC) to nurture and grow the UK's food manufacturing digital economy. The project will run from May 2018 until May 2021.

The Internet of Food Things (IoFT) Network Plus brings together data and computer scientists, chemists, and economists to investigate how artificial intelligence, data analytics and emerging technologies can enhance the digitalisation of the UK food supply chain. The network, led by the University of Lincoln in partnership with the universities of Southampton, Surrey, University of East Anglia, and the Open University, is examining the application of the IoT in connected homes of the future – for example smart refrigerators which trigger a grocery order when food items run low, or cooking devices which could help us live healthier lives.

We are also examining the traceability of food, and how machine learning and artificial intelligence can be utilised to extract value from the vast amounts of data available across the whole food supply chain, improving efficiency and reducing food waste. The overarching perspective of the multi-disciplinary Network is on the societal impact of all of these transformational technologies.

Professor Simon Pearson, Director of the Lincoln Institute for Agri-food Technology (LIAT) at the University of Lincoln, said: "The food supply chain from farm to consumer generates £112bn GVA per year and employs 3.9 million people, but it is operating against a backdrop of an increasingly competitive environment. It has never been more vital that we find ways to work more efficiently, saving money for producers, manufacturers, retailers, and consumers.

The inclusion of food retailers like Tesco within the consortium provides access to unrivalled data sets demonstrating behaviours. Alongside academic expertise, the project will involve industry specialists from a range of areas, such as global engineering giant Siemens, machine management firm IMS-Evolve, supermarket chain Tesco, the rural agricultural consultancy Collison and Associates, and the High Value Manufacturing Catapult. Regulators such as the Food Standards Agency and GS1, an international agency that sets data standards for bar codes will also have input, and consumers will be engaged through representative bodies.

### Challenges

The "Internet of Food Things" will create an interdisciplinary network that defragments and expands the UK's food digital economy. Food and drink is the largest manufacturing sector of the UK economy. The food supply chain from farm to consumer generates £108bn GVA per year and employs 3.9m people. In addition, food has highly significant social and environmental impacts. Obesity alone, including downstream health impacts such as diabetes,



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heart disease etc, costs the UK economy £49bn per annum. There are still c. 1,000,000 cases of food poisoning per year costing £1.5bn p.a.. Food generates up to 30% of the UK's road freight, but 10MT of food, generating 20MTCO<sub>2e</sub> of GHG emissions, are wasted each year.

Digital technology has the potential to transform the food chain, for example, opportunities (that map onto the EPSRC DE Network strategy) include but are not limited to:

- New business models via distributed ledger technology (DLT) to underpin the traceability of food. The recent Holmes report identified food as one of the key seven UK industry sectors most likely to benefit from DLTs.
- The creation of a "data trust" for the food sector to underpin data sharing, trust and interoperability within complex supply chains.
- Wide scale application of the internet of things (IoT) for the service community, for example, the use of IoT by domestic users (refrigerators, cooking devices etc) to improve health outcomes and reduce waste.
- The development of new digital labelling protocols that assist with consumer use of food as well as supply chain optimisation,
- The use of novel digital technologies (e.g. artificial intelligence) to reduce food waste by optimising whole supply chains from manufacturer to consumer.

Hitherto these opportunities have not or are only partially realised. There is an urgent need to defragment the digitally inspired academic community and connect it to food industry practitioners.

## Team

The academic leadership team is responsible for setting the direction of the investigative compass of the Network and ensuring that activities remain relevant and compelling.

### **Academic leadership team:**

- Professor Simon Pearson, University of Lincoln (Principal Investigator)
- Professor Jeremy Frey, University of Southampton
- Professor Roger Maull, University of Surrey
- Professor Gerard Parr, University of East Anglia
- Professor Andrea Zisman, The Open University
- Professor Luc Bidaut, University of Lincoln

The project's operations team are responsible for the organisational and communication aspects of the Network Plus. This includes organising and facilitating workshops and meetings, organising and promoting conferences and other engagement and communication duties.



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## Project operations team at the University of Lincoln

- Simon Pearson (Principal Investigator)
- Steve Brewer (Network Coordinator)
- Jill Duarte (Network Administration)

Although the digital focus of our activities is in within EPSRC's remit (IoT, blockchain, data trusts, interoperability issues), the Network will multiply impact by including interdisciplinary contributions from food science and technology practitioners, policy makers, engineers, management specialists and colleagues in social and behavioural sciences. The Network will include academia, industry and consumer interests. The industry interest covers the whole food and digital innovation chain including food manufacturers (e.g. Food and Drink Federation, EPSRC Food CIM), IoT and digital specialists (Siemens and IMS Evolve), the HVM Catapult and regulators such as the Food Standards Agency and GS1 the international agency that sets data standards (bar codes) for retail. Consumers will be represented throughout, but the inclusion of food retailers within the consortium provides access to unrivalled data sets demonstrating behaviours.

## Activities

The Internet of Food Things Network Plus will facilitate a number of key activities, including a marketing, social media, workshop and conference campaign that yields a large scale community network who have mutual interests within the food digital domain. We will host one main conference per year and in addition 3 facilitated workshops each year to deep dive key questions within the digital food domain. Pilot studies and detailed reviews will be commissioned to underpin horizon scanning perspectives.

## Launch

The launch event will kick-start the activities of the Network by bringing the founding academic and partners together, with many others from across academia, business and various policy-making bodies including Government departments, all with a common shared awareness of the pressing challenges surrounding the food manufacturing chain and the role that new technologies can play in addressing them.

**Launch:** EPSRC-funded Internet of Food Things Network Plus

**Date:** 21st September 2018

**Location:** The IET's Global Engineering Hub, Savoy Place, London

**Programme:** 11:00 – 15:30 (for the main talks and discussions)

The full programme will include:

- Introduction to the EPSRC-funded Internet of Food Things Network Plus: Professor Simon Pearson, University of Lincoln, Network Lead for the IoFT Network Plus
- Keynote talks from sector experts from industry, government and academia



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- Panel discussions on key issues with Q&A
- Release of new funding opportunities from across the sector including from the Network itself. These will include: pilot projects, white papers and other related initiatives
- Innovation case studies from industry and the research community will be presented
- Networking opportunities throughout the day
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Tea, coffee and pastries will be available on arrival from 10:30, a light buffet lunch will be served and refreshments will be available at the end of the day (15:30). All of which should contribute to a productive networking environment amongst attendees.

**Tickets:** free (places limited to 120)

Attendance is free of charge but by ticket. If you would like to attend please get in touch with the Network via the following email address and we will get back to you to confirm your place and supply a ticket. Early booking recommended!

<https://www.eventbrite.com/e/internet-of-food-things-network-plus-launch-event-tickets-48868030595>

## Who should attend?

- Academics interested in food manufacturing, security and supply chain innovation
- Food manufacturers, processors, and related organisations
- Technologists with innovative solutions for the sector (SMEs and larger organisations)
- Trade organisations, Regulators and policy makers

## About the IoFT Network

The Internet of Food Things (IoFT) Network Plus brings together data and computer scientists, chemists, and economists to investigate how artificial intelligence, data analytics and emerging technologies can enhance the digitalisation of the UK food supply chain. IoFT will examine the application of the IoT in connected homes of the future – for example smart refrigerators which trigger a grocery order when food items run low, or cooking devices which could help us live healthier lives.

It will also examine the traceability of food, and how machine learning and artificial intelligence could be utilised to extract value from the vast amounts of data available across the whole food supply chain, improving efficiency and reducing food waste.

## Venue:

The Institute of Engineering and Technology (IET) has been selected as the venue for our launch to celebrate the UK's heritage of creative innovation in the field of engineering and technology and the close relationship with this and the manufacturing sector of which food is the largest component. The IET sits in a commanding location on the North bank of the Thames and is therefore easily accessible from many directions.



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## Opportunities

We will be funding a range of pilot studies and detailed reviews to underpin horizon scanning. These will be published as white papers. All the research challenges will be co-designed and co-created with industry. The network will facilitate onward research funding and also catalyse interest in the food digital economy. In addition to network activities, we will deliver a comprehensive pathway to impact that engages professional practitioners as well as the general public and schools.

We will publish calls to the Network community, and beyond, throughout the 3-year lifetime of the Network. We have found with previous Networks that workshop and conference attendee are better attuned to the calls, and can deliver deeply relevant proposals, and projects, that in turn help build the Network as a whole and grow the community.

## Get involved

The Internet of Food Things Network Plus is an open network that anyone can join who has an interest in the topics described above. The thrust of the activities and discussions will be led by the project's academic leadership with a strong steer provided by the Advisory Board, a collection of business and policy specialists from the field.

The Network mailing list can be joined here:

<https://www.jiscmail.ac.uk/lists/FOODCHAIN.html>

Essentially signing up to the mailing list makes you a member of the Network, sub-groups and specialist working groups may be established over the course of the project, but the mailing list group will be the place where all key ideas and opportunities are shared.

Contact:

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23 August 2018