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Newsletter: Issue 1: Summer 2017

Introduction

Professor Sarah Sharples, Principal Investigator

As Connected Everything approaches the end of its first year, this first newsletter provides a round-up of progress towards answering the question 'how do we support the future of manufacturing in the UK?'. Our approach takes as its starting point the proliferation of connections - between machines, data and people - which characterises the changed context within which UK industries are operating and to which they must respond. Our industries must be supported to take advantage of opportunities arising from rapidly advancing digital technologies. Following widespread recognition of the need for a strategic and co-ordinated effort, and since Connected Everything began, the government has announced its Industrial Strategy. But there is much to be decided upon.

Connected Everything's outputs will contribute by helping strategic choices to be made with respect to future UK research funding. To this end, a series of activities has been initiated; these will inform the debate about our future research priorities. Thus far, Connected Everything has identified seven key thematic areas of UK academic research to survey; the output of this work will be a set of position statements to be released in 2018.

A set of feasibility studies is situated at the heart of the network; these studies are delivering demonstrators of what might, or might not, be possible and, as such, provide fertile grounds for debate. Connected Everything's first year culminated in a collaborative and inclusive first annual conference. A Connected Everything Summer School for PhD students and early career researchers will take place in September at the University of Warwick.

As Connected Everything develops, during its second year, we will have a strong focus in reaching out to, and forge links with, industry. At our second annual conference, to be held at Newcastle University in June 2018, the views of people working within industry will be given a platform and collaboration between academics and industry will be facilitated. In the meantime, our website is being continually developed to help our network of interested parties keep abreast of the latest developments and find out about forthcoming events. Throughout this newsletter links to further details on the website are included. We look forward to continuing to work with the diverse community of network members through our second feasibility studies call, thematic events and preparation for our annual conference over the coming months.

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Thematic areas

'Champions' are co-ordinating work to identify the key areas of excellence and gaps in UK academic research in selected thematic areas. This work will lead to a set of position statements to be released in 2018. Our current definitions of these thematic areas are given at the links below.

Duncan McFarlane, IfM, University of Cambridge Industrial internet of things

David Brown, University of Portsmouth Data analytics and decision making

Roger Maull, University of Surrey Service design and customisation

Fiona Charnley, Cranfield University Design for future manufacturing

Svetan Ratchev, University of Nottingham Cyber-physical systems

Sarah Sharples, University of Nottingham The future industrial worker

A series of events are being planned to support and inform this work. The first of these, including an IoT workshop at the IFM, University of Cambridge, and a joint workshop at the University of Nottingham, will take place in October. When the details of these events have been finalised, they will be publicised on the Connected Everything website.

Feasibility studies

Applications are now invited for a second round of feasibility studies. Details can be found at our second feasibility studies call

Key dates:

28 July 2017 Call for proposals goes live

15 Sept 2017 Virtual Q&A information session

29 Sept 2017 Deadline for submissions

27 Oct 2017 Invitations to Dragons' Den Day issued

27 Oct 2017 Unsuccessful proposals advised

13 Nov 2017 Dragons' Den Day

22 Nov 2017 Successful proposals announced

06 Dec 2017 Kick-off meeting, at the University of Nottingham

Jan 2018 Second round feasibility studies begin

Six feasibility studies are underway. The studies have time frames of between 8 and 18 months. The project teams are multi-disciplinary and include one or more industry partners. Further details of these studies are available at: feasibility studies (round one).

Feasibility study introductory videos

BREWNET: Intelligent Cloud Connected Sensors for Economic Small Scale Process Optimisation

University of Nottingham and University of Leeds

Investigating Spoken Dialogue to Support Manufacturing Processes

University of Sheffield

Towards Additive Manufacturing Process Control using Semi-Supervised Learning

University of Liverpool

Feasibility of Capturing Crafts-based Knowledge in an AI System for Future Autonomous Precision-Surface Manufacturing

University of Huddersfield and University of Nottingham

Circular 4.0: Digital Intelligence to Enable a Circular Economy

Cranfield University

Digitisation of Collaborative Human-Robot Work Spaces

University of Loughborough

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Annual conference

University of Glasgow on 20 and 21 June, 2017.

Keynote presentations were given by:

1. Professor Sarah Sharples, 'Connected Everything: Our Approach'
2. Professor Jorn Mehnen, 'Trends in Industry 4.0'
3. Professor Jing Cheng. 'Challenges and opportunities of customising design and manufacture for the healthcare sector'.

Oral presentations sessions covered:

- Feasibility studies
- Industry perspectives
- Smart design
- Digital manufacturing
- Digital industrial systems

Poster presentations

There were 21 posters displayed, most of which can be viewed at conference posters

Prizes were awarded to the best of these with respect to 1. Education, 2. Application and 3. Research

1. View the best 'Education' poster

'A Review of Data-Driven Approaches for Circular Economy in Manufacturing for Digital Technologies', O. Okorie, A. Tiwari, F. Charnley, M. Moreno, J. Oyekan, W. Hutabarat, Cranfield University.

2. View the best 'Application' poster

'In-process monitoring and quality control of hot forging processes towards Industry 4.0', C. Onyeiwu (1), E. Yang (1), W Ion (1), X-T. Yan (1), T. Rodden (2) and R. Zantel (2). (1) University of Strathclyde, (2) Advanced Forming Research Centre

3. View the best 'Research' poster

'Methods for predicting material removal energy consumption in turning', Y. Liu (1), J. Lv (2) and R. Tang (3). (1) University of Glasgow, (2) Northwestern Polytechnical University, (3) Zhejiang University.

Conference proceedings

Full details of the schedule can be found at conference programme

Full details of the presentations, including abstracts and contributor's details, can be found at conference booklet

Summer School for PhD students

University of Warwick, 12 - 15 September 2017

Following a competitive process, we are proud to announce that the ***2017 Connected Everything Summer School*** will be hosted by Swansea University and the University of Warwick, in collaboration with the Natural Computing and Applications Forum and the Neural Computing and Applications Journal.

The Summer School "Machine Learning in Manufacturing: Addressing the Challenges of Industry 4.0", will take place between 12th and 15th September 2017 at the University of Warwick.

Aim: Industry 4.0, Digital Manufacturing, Big Data Analytics have created new opportunities for cross fertilisation of machine learning and manufacturing streams. The objective of this summer school is to bring together research students and early career researchers in statistics, machine learning and data mining community with interest in manufacturing as well as manufacturing researchers who want to see how information technology and artificial intelligence can help them. The summer school wants to bring these interdisciplinary teams together to look at machine learning opportunities offered by, but not limited to, the following themes.

- Predictive Analytics and Data Visualisation in Manufacturing
- Supply Chain Management and Connected Enterprise
- Automated Inspection and Image Processing
- Human-Robot and Robot-Robot Interactions

Leading experts from manufacturing industries will speak on the current challenges they are facing in their journey towards Industry 4.0. They will identify expectations from machine learning community and present number of inspiring and thought provoking case studies. In addition, there will be group discussions, hands on examples of industrially relevant problems and a mock EPSRC style panel review meeting.

Full details, including a list of speakers and details of how to apply for a place, can be found at Machine Learning in Manufacturing Summer School

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Connected Everything at the International Robotics Showcase, 30th June 2017

The EPSRC-funded UK-RAS Network recently held a week of events, culminating in the International Robotics Showcase on Friday 30th June 2017, at the IET, Savoy Place in London. At this showcase, the UK-RAS Network launched a series of white papers covering the current research landscape in 'Artificial Intelligence and Robotics Robotics in Social Care Extreme Environments Robotics Robotics and Autonomous Systems for Resilient Infrastructure'.

Connected Everything had a stand at the Showcase, to encourage colleagues to find out more about our work and how it links with other EPSRC-funded networks, as well as the wider policy context. Some very interesting links were made and it was clear from discussions and presentations that our feasibility studies are directly related to the challenges identified in the work of the UK-RAS Network.

Join Connected Everything at connectedeverything.ac.uk

- Visit our website
- Find out about forthcoming events and activities
- Let us know what would be useful to you
- Promote an event through Connected Everything

Connected Everything's membership now exceeds 150 people. Almost 60 institutions and organisations are represented. We continue to grow and are keen to include everyone with an interest or contribution to make.

Connected Everything is led by **Professor Sarah Sharples, University of Nottingham,** and an **Executive Group,** with members from **18** organisations. The Executive Group provides guidance to the Network and links to other key strategic funded initiatives.

Two new people have been invited to join the Executive Group; we are happy to welcome Dr Andrea Johnston of CMAC, University of Strathclyde and Professor Mike Chantler of Heriot Watt University.

Full details of the current membership of the Executive Group can be found at Connected Everything Executive Group