connected everything.
industrial systems in the digital age

Newsletter Issue 2: Autumn 2017

This second newsletter provides an update on the network's activities and news of related events:

- Thematic areas

- Feasibility studies

- Our early career researchers

- Summer schools

- Events (external to the network)

- Made smarter review 2017, Juergen Maier, CEO Siemens

- Connected Everything grows...

Please click on the links given throughout the newsletter for further details.

Thematic areas

Our thematic area champions are delivering several events this month. These events will bring people together in a workshop format to consider key aspects of the following network themes: 1) Internet of things   2) The future industrial worker 3) Data analytics and decision making.

1. [Internet of things for industry, Institute for Manufacturing, University of Cambridge, 23rd November 2017](#)

- What is IoT (Internet of Things) and what does it mean for industrial operations?

- Why should a company consider investing?

- How will IoT increase the data that influences industrial operations?

- What are the best opportunities for IoT?

SPEAKERS

Speakers will include representatives from industry, academia and government/standards agencies in order to give a comprehensive overview of IIoT from service providers and regulators to end-users.

2. [The future industrial worker, University of Nottingham, 23rd November 2017](#)

The workshop will define research priorities of relevance to manufacturing work places in the future. Sessions will address the following questions:

- What are the affects of increased automation and increased use of analytics for decision-making?

- What are the affects of a diminishing need for 'craft-based' skills?

- How will we keep the human worker 'in the loop', with sufficient scope for intervention?

3. [Data analytics and decision making in manufacturing, University of Portsmouth, 30th November 2017](#)

The workshop will address the question "What does Industry really want from Data" ?

Introductory Lecture from Prof David Brown - "The Changing Face of Manufacturing"

Prof Djamila Ouelhadj and Dr Edward Smart will be part of the information gathering team to seek opinions on industrial requirements from machine and operational data.

The event is organised by the South Coast Centre of Excellence in Satellite Applications

[Book by Eventbrite](#)

Feasibility studies

Second funding call for feasibility studies: an update

The second funding call for proposals for feasibility studies closed on 29th September, with 19 submissions received. Following the review process, nine project teams have been invited to pitch their proposals at a Dragons' Den Pitch Day. This will take place on Thursday 23rd November 2017 at the Digital Catapult office in London. We are intending to fund 5 more projects.

Early Career Researchers (ECRs)

Connected Everything's feasibility study funding calls have made the inclusion of Early Career Researchers a priority. We have a high proportion of ECRs in the project teams. Another priority has been to fund proposals which are multi-disciplinary.   Thus, Connected Everything is providing a rich network and community of support to researchers. We hope that our ECRs are making the most of all the opportunities to make contacts for their academic lives, at network events, both with other feasibility study researchers and within the wider digital manufacturing community.

Connected Everything's Early Career Researchers

Early Career Researcher profiles: Dr Peter Green and Dr Kate Black

Peter is leading the feasibility study ["Towards additive manufacturing process control using machine learning."](#) Kate is a co-investigator on the project, together with Professor Chris Sutcliffe. Their study aims to use machine learning to provide additive manufacturers with a way of inexpensively, accurately and automatically identifying faulty parts.

Both Peter and Kate spend only a fraction of their time working on the project. They have other teaching and research commitments within the School of Engineering at the University of Liverpool.

Peter Green read a Masters degree in Mechanical Engineering at the University of Sheffield from 2005 to 2009. He then undertook a PhD, analysing the response of nonlinear energy harvesters to random excitations, which was awarded in 2012. An EPSRC/University of Sheffield fellowship followed, during which time his research became focused on the quantification of uncertainties involved in modelling nonlinear dynamical systems. He continued this research working on the EPSRC Programme Grant 'Engineering Nonlinearity'. In 2015, Peter became a Lecturer in Uncertainty and Engineering at the University of Liverpool.

Kate Black was awarded a PhD in Material Science at the University of Liverpool in 2008. She then joined the Centre for Advance Photonic and Electronics, University of Cambridge, as a Research Associate, where she worked primarily on the development of novel materials for supercapacitors. In 2013, Kate became a Lecturer in the Centre for Materials and Structures at the University of Liverpool, School of Engineering.

Kate's research interests are primarily focused on the development of novel functional materials, using inkjet printing, for the manufacture of electronic and optoelectronic devices. Her main area of expertise is in the development of novel Reactive Organo-Metallic inks (ROM) which are particle-free and can be exploited to produce a wide a variety of functional materials, such as conductors, insulators and semiconductors.

Kate makes contributions in several committees:

- Membership of the EPSRC Early Career Forum in Manufacturing Research (EPSRC 2014)

- Chairman for Liverpool Women in Science and Engineering (LivWiSE)

- Board member for the Young Academy of Europe

- EPSRC member of the Strategic advisory team for the theme Manufacturing the Future.

Connected Everything summer schools

Call for a 2018 summer school host institution

Connected Everything is looking for an institution or group of institutions to host our 2018 Summer School. The Summer School is to be a multi-day event, open to PhD students in any of the disciplines relevant to digital manufacturing.

Our summer school, 2017

Machine learning in manufacturing: Addressing the challenges of Industry 4.0, 12th to 15th September 2017

The Machine Learning in Manufacturing Summer School: Addressing the Challenges of Industry 4.0 took place in September 2017 at Warwick Manufacturing Group, University of Warwick. It was a collaboration between Professor Darek Ceglarek from Warwick Manufacturing Group and Dr Rajesh Ransing from Swansea University. The Summer School was funded by the EPSRC Network Plus *Connected Everything: Industrial Systems in the Digital Age* and kindly sponsored by Natural Computing Applications Forum (NCAF) and Neural Computing and Applications (NC&A) Journal.

Industry 4.0, Digital Manufacturing and Big Data Analytics have created new opportunities for cross-fertilisation of machine learning and manufacturing streams. The objective of the Summer School was to bring together research students and early career researchers in statistics, the machine learning and data mining communities with interests in manufacturing, as well as manufacturing researchers who wanted to see how information technology and artificial intelligence could help them.

Among the topics explored were: Predictive Analytics and Data Visualisation in Manufacturing, Supply Chain Management and Connected Enterprise, Automated Inspection and Image Processing and Human-Robot and Robot-Robot Interactions. Leading experts from manufacturing industries spoke on the current challenges they were facing in their journeys towards Industry 4.0. They identified expectations from the machine learning community and presented a number of inspiring and thought-provoking case studies. In addition, there were group discussions, hands-on examples of industry-relevant problems and a mock EPSRC-style panel review meeting.

Students were asked to bring a poster of their current work and prepare a reflective presentation starting with their machine learning problem and sharing their experience of what worked best, what could have been done better, what did not work as expected and any topics that they wanted to suggest for group discussions. The purpose of the presentation was to facilitate peer discussions and Q&A in order to gain feedback. Time was also allocated to group discussions on topics of the delegates' choice. Students received the chance to take part in the Summer School Competition, with a £1000 prize for the winner, on the Uni-pol Challenge on data analytics and machine learning. This was sponsored by the Neural Computing and Applications Journal. It

was an opportunity for machine learning experts to make a difference. A special issue of the Neural Computing and Applications Journal is being prepared.

Events

Disruptive Innovation Festival: Circular 4.0 and the role of data to enable remanufacturing.

Session on *24th November 2017, 10:00am GMT*

The online festival of ideas that asks:- what if we could redesign everything?

In this session, Windo Hutabarat and Mariale Moreno will discuss how data captured through sensors could help to diagnose the integrity of vehicle components to enhance remanufacturing processes.

Knowledge Transfer Network workshop: Embedded Artificial Intelligence, *23rd November 2017*

The event is being organised by the KTN in cooperation with the *EPSRC efutures network*, and the *Robotics & AI Special Interest Group*

Artificial Intelligence (AI), Neural Networks or Machine Learning technologies are being

adopted in many circumstances, but usually all of the data has to be sent to a server for processing before being acted upon.

There would be many advantages of being able to do this analysis on the embedded system itself - faster decision making and the ability to implement AI in situations where the data link is not possible. The problem is that traditional embedded compute platforms cannot handle the processing power required. The solution is not just faster silicon but also new architectures and ways to implement systems.

The Knowledge Transfer Network (www.ktn-uk.org) is organising a workshop "Embedded AI Part 1- Smart Silicon" on the 23rd November in London that will bring together technology suppliers and technology users to discuss the opportunities and barriers to the deployment of next generation systems.

At the event experts (industry and academic) will give presentations covering this topic to promote discussion and share learning.

Registration site: https://embedded-ai-part1-smart-silicon.eventbrite.co.uk

For further details contact nigel.rix@ktn-uk.org

Industry 4.0 Summit, *28th February and 1st March 2018*

The UK's first dedicated Industry 4.0 conference and exhibition was held on the 4th and 5th April 2017 and attracted over 270 conference delegates, 70 exhibitors and 1,500 trade attendees.

You can get involved in the next edition of the Industry 4.0 Summit to be held at the Manchester Convention Centre, UK.

The event will showcase, provide opportunities for discussion and demonstrate hundreds of innovations to help manufacturers digitise and upgrade operations. Over two days there will be presentations from 40 leading experts on industry 4.0, Industrial Internet of Things (IIoT) and smart manufacturing, with plenty of case studies of industry 4.0 in action.

The Summit is supported by Innovate UK, Knowledge Transfer Network, GAMBICA & EEF.

Factories of the Future Expo

Running parallel to the Summit, the Factories of the Future Expo will showcase the latest products and services for Industry 4.0, IIoT, smart factories and advanced manufacturing. Over 2,000 manufacturing & supply chain professionals from across UK and Europe will attend to see the latest advances in automation, robotics, software, sensors, virtual reality, 3D printing, Big Data, predictive maintenance, human-machine interfaces and many other related areas.

Industry 4.0 Academia

Manufacturing experts Professor Paulo Bartolo and Dr Carl Diver, from The University of Manchester, have jointly announced Industry 4.0 Academia, which will run in collaboration with the Industry 4.0 Summit in Manchester next year.

Dr Carl Diver, from Manchester's School of Mechanical, Aerospace and Civil Engineering said...

"...we are announcing a unique academic conference on Industry 4.0 that will be held in the birthplace of the first Industrial Revolution - this conference will bring together the leading academic and industry experts under one roof in Manchester. It will be an opportunity for deeper engagement around the direction that Industry 4.0 is taking and a chance for industrialists and academics to get together and identify areas that offer opportunities for cutting edge research – including commercialisation. We will have renowned keynote academic speakers coming to Manchester to discuss their vision of Industry 4.0."

Call for Abstracts

Redistributed Manufacturing in Healthcare (RiHN) Network: Launch of White Paper, *6th December*

The Redistributed Manufacturing in Healthcare (RiHN) Network is pleased to announce the launch of RiHN White Paper "Redistributed Manufacturing in Healthcare: Creating New Value through Disruptive Innovation" in London on 6th December at 1830.

Please contact info@rihn.org.uk to book a place.

Their twitter feed is @epsrcrihn and website is www.rihn.org.uk.

MADE SMARTER REVIEW 2017, Professor Juergen Maier, CEO Siemens UK

The MADE SMARTER REVIEW 2017, formerly referred to as the Industrial Digitalisation Review, was released at the end of October 2017.

The Industrial Digitalisation Review was announced on the 23rd January 2017, as part of the Government's new Industrial Strategy. It was an independent review, chaired by Juergen Maier, CEO Siemens UK and Ireland, and has received active contributions from more than 200 organisations. The task was to assess how the UK can benefit from the accelerated adoption of digital technology across advanced manufacturing. It aimed to identify how Britain can lead the fourth industrial revolution.

Read Juergen Maier's commentary, in his personal blog, on "Why Britain must lead the fourth industrial revolution".
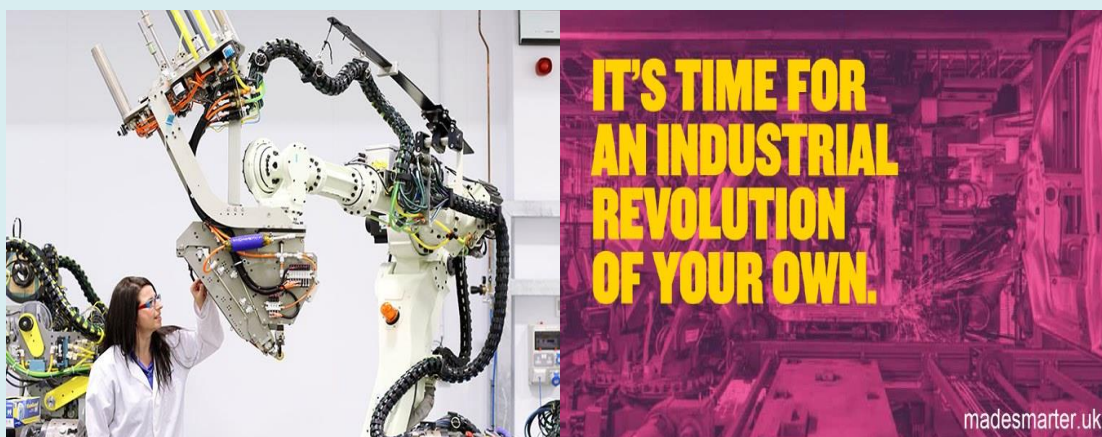
Connected Everything's expected contribution is recognised within the review.

Connected Everything grows...

Connected Everything's membership now exceeds 170 people. More than 80 institutions and organisations are represented. We continue to grow and are keen to include everyone with an interest or contribution to make.

Join Connected Everything

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 Executive Group

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 initiatives.