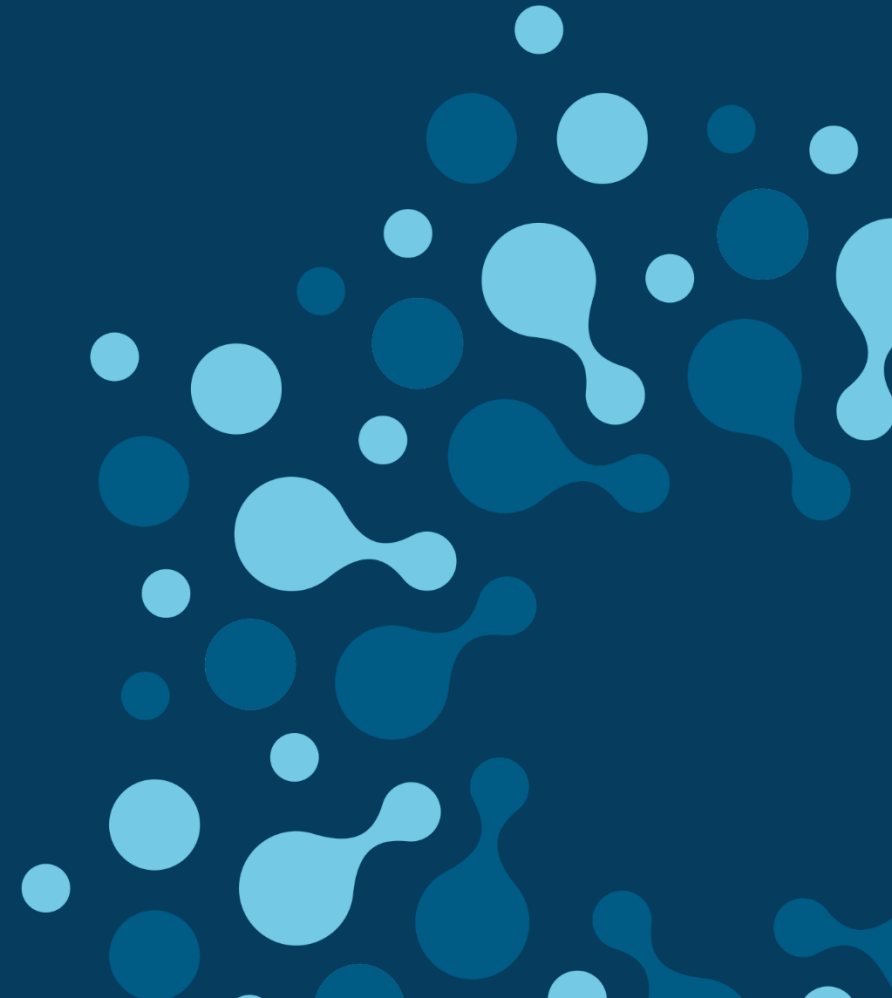


An Afternoon on... IoT for Smart Cities

Dr Geoff Merrett, Head of C-IoT

06 March 2019



PEOPLE

C-IoT Management Group

- Agents, Interaction and Complexity, [Dr Sebastian Stein](#)
- Biomedical Electronics, [Prof Koushik Maharatna](#)
- Cyber Physical Systems, [Dr Thai Son Hoang](#), [Dr Gary Wills](#), [Dr Geoff Merrett](#)
- Cyber Security, [Dr Leonardo Aniello](#)
- Electrical Power Engineering, [Dr Thomas Andritsch](#)
- Machine Intelligence, [Dr Thanassis Tiropanis](#)
- Next Generation Wireless, [Dr Mohammed El-Hajjar](#)
- Outreach, [Dr Reena Pau](#)
- Smart Electronic Materials and Systems, [Dr Alex Weddell](#), [Dr Nick Harris](#)
- Sustainable Electronic Technologies, [Prof Mark Zwolinski](#)
- Vision, Learning and Control, [Dr Bing Chu](#)
- Web and Internet Science, [Dr Thanassis Tiropanis](#), [Prof Kirk Martinez](#)

C-IOT RESEARCH AREAS



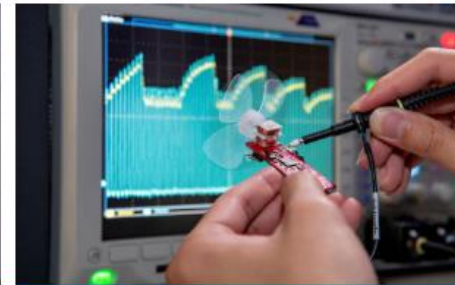
Sensor Technologies

Research into new and novel sensor devices to enable new innovative applications



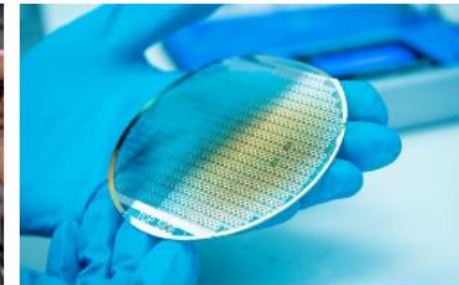
Data Management and Analysis

Accessing and making sense of the wealth of data obtained from the IoT.



Power and Energy

Increasing the lifetime or autonomy of IoT devices through improved management and efficiency and/or self-powered approaches.



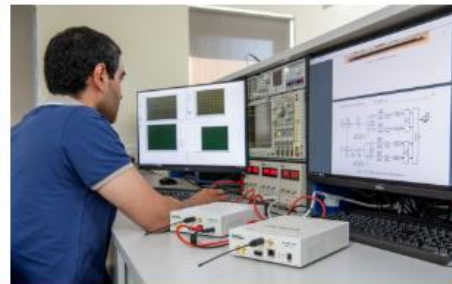
Nanotechnology and Transistor Devices

Enabling faster, cheaper and/or lower-power computation.



Security, Safety and Privacy

Enabling a secure and trusted IoT, from hardware through to software.



Communications and Networking

5G communication and efficient networking to support future systems.



Information Processing and Machine Intelligence*

Processing data and inferring information

C-IOT APPLICATION DOMAINS



Health and Well-being*

Improving quality of life through effective technologies for health care and well-being.



Earth Science

Improving our understanding of the environment around us through remote monitoring.



Smart Energy Systems

IoT systems to enable more effective and efficient generation, delivery, consumption and sharing of energy.



Smart Cities

Increasing connectivity and intelligence in towns and cities to improve services, sustainability, and quality of life.



Agricultural Management

Improving agricultural processes through improved awareness, intelligence and connectivity.



Smart Homes

Intelligent systems, connecting devices to simplify and automate everyday life.

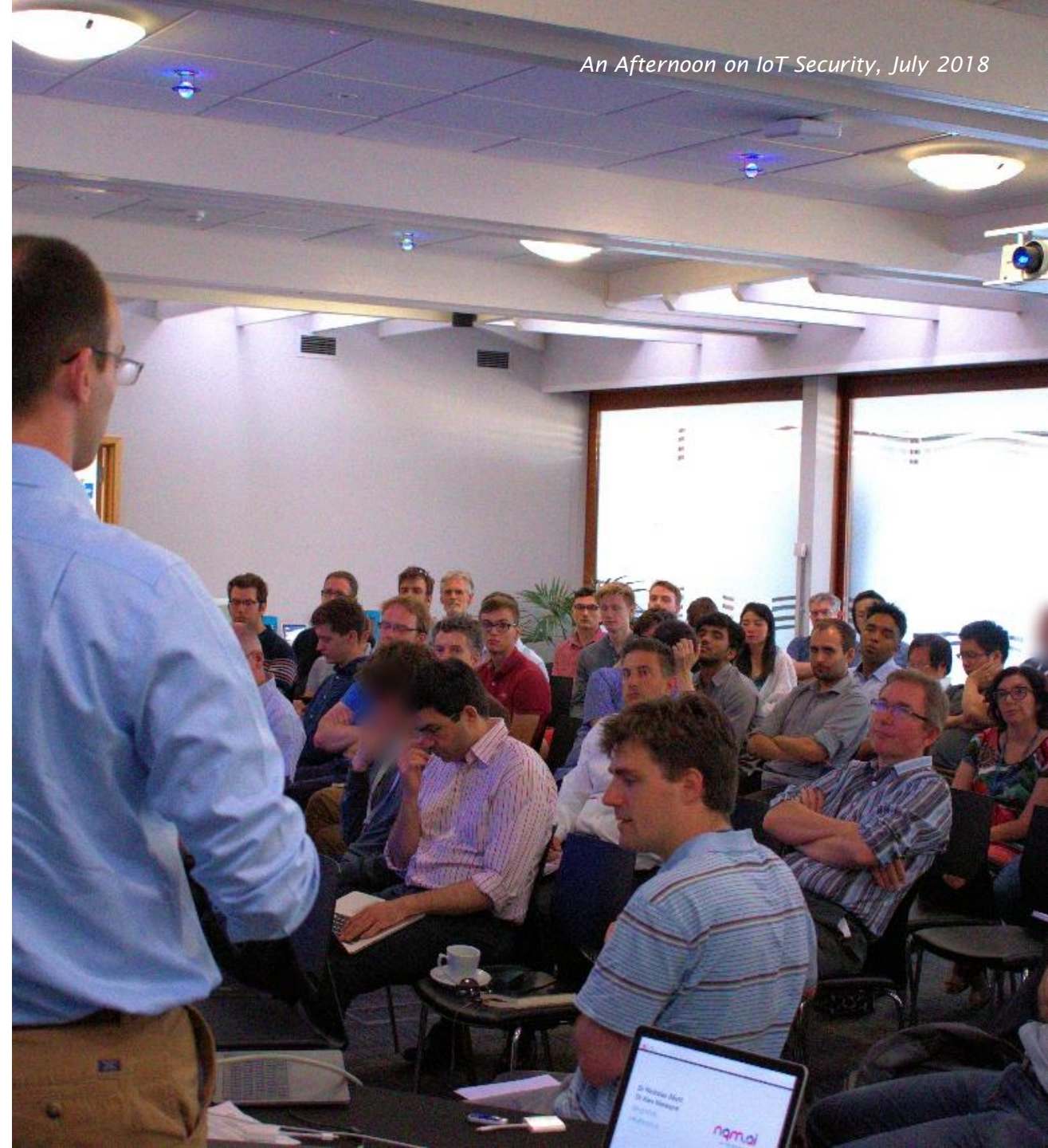
EVENTS

Afternoon on IoT Security, July 2018

- External 'launch' event
- 11x 10-min presentations
 - 6 from companies/organisations
 - 5 from academics (4 from ECS)
- >70 attendees

Afternoon on IoT for Smart Cities

- 9x 10-/20-min presentations
 - 4 from companies/organisations
 - 5 from academics (3 from ECS)
- ~100 registrations



EVENTS

Networking Event, June 2018

- Internal 'launch' event to showcase IoT research in ECS
- 24 IoT posters presented
- >50 attendees

Hackathon, September 2018

- Hands-on researcher-led collaboration event

IoT in FEPS Poster Event, 05 Apr 2019

- Details to be announced



Our Past Seminars

Details of our [past seminars](#) are listed below:



The Paradigm of Smart Circular Economy, 20/Feb/2019

Dr Marios Angelopoulos, Bournemouth University: "The Paradigm of Smart Circular Economy" (organised by the WAIS group)



Seminars on Hardware Security, 01/Feb/2019

Prof Yier Jin, University of Florida; Yildiran Yilmaz and Haibo Su: Presentations on topics in Hardware Security (organised by the SET group)



Multicast Forwarding in 6LoWPANs with Contiki-NG, 23/Jan/2019

Dr George Oikonomou, Bristol University: "Multicast forwarding in 6LoWPANs with Contiki-NG"



Low Power Wireless Sensing using LoRaWAN, 29/Nov/2018

Dr Nick Harris and Josh Curry: "Low Power Wireless Sensing: Design Decisions, Trade-Offs, and using LoRaWAN". Click to review a recording of the seminar.



Crowdsourced Air Pollution Monitoring using Low Cost Mobile Sensors, 21/Nov/2018

Dr Long Tran-Thanh: "Crowdsourced Air Pollution Monitoring in Ho Chi Minh City-Vietnam with Low Cost Mobile Sensors". Click to view presentation slides.



Automatic Aggregation of IoT Sensor Data, 31/Oct/2018

Dr Paolo Paretì: "Automatic Aggregation of IoT Sensor Data for Health and Safety Monitoring"



Energy Driven Design of Self-Powered IoT Devices, 10/Oct/2018

Samuel Wong: "Energy Driven Design of Self-Powered IoT Devices: Applications in Cycling Performance Monitoring"



Hardware-Based Security Solutions for IoT, 23/July/2018

Dr Basel Halak: "Hardware-Based Security Solutions for the Internet of Things".



Our Reading Groups

The Centre hosts a number of interdisciplinary reading groups, cutting across ECS' research groups. These meet regularly to discuss papers, new research and ideas, and potential opportunities for collaboration. If you are a researcher in ECS and would like to join one of the reading groups, please follow the links below to find out more.

Self-Powered Compute

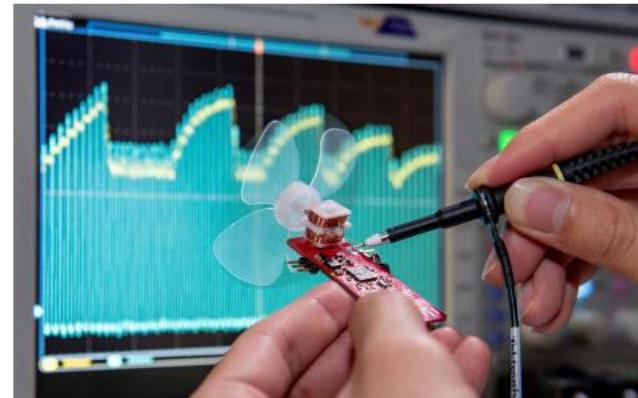
IoT Security

Smart Energy Systems

This reading group, for interested PhD students and postdocs, explores the challenges surrounding performing compute on IoT systems powered from environmental or scavenged energy.

This C-IoT reading group is coordinated by [Dr Domenico Balsamo](#). You can visit www.transient.ecs.soton.ac.uk to find out more about the research field.

If you are a member of the University of Southampton, click the link below to visit the reading group website to find out more (you will need to login with your University credentials).



Self-powered computing research



Self-Powered Compute Reading Group

FIND OUT MORE

- Keep an eye on our website
www.c-iot.ecs.soton.ac.uk
- Register an interest to find out about:
 - Future events
 - Opportunities for collaboration (targeted)

www.c-iot.ecs.soton.ac.uk/find-out-more

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Our Upcoming Events

The Centre for Internet of Things and Pervasive Systems organises a wide range of events for both internal and external audiences. Details of our upcoming events, including information on how to register for them, is provided here.

An Afternoon on IoT Security, 03/July/2018

The Centre is organising an afternoon event on the topic of IoT Security. The programme includes presentations from both academics and industry, along with supporting posters and demonstrations to showcase the work.

[Find out more](#)



Our Upcoming Seminars

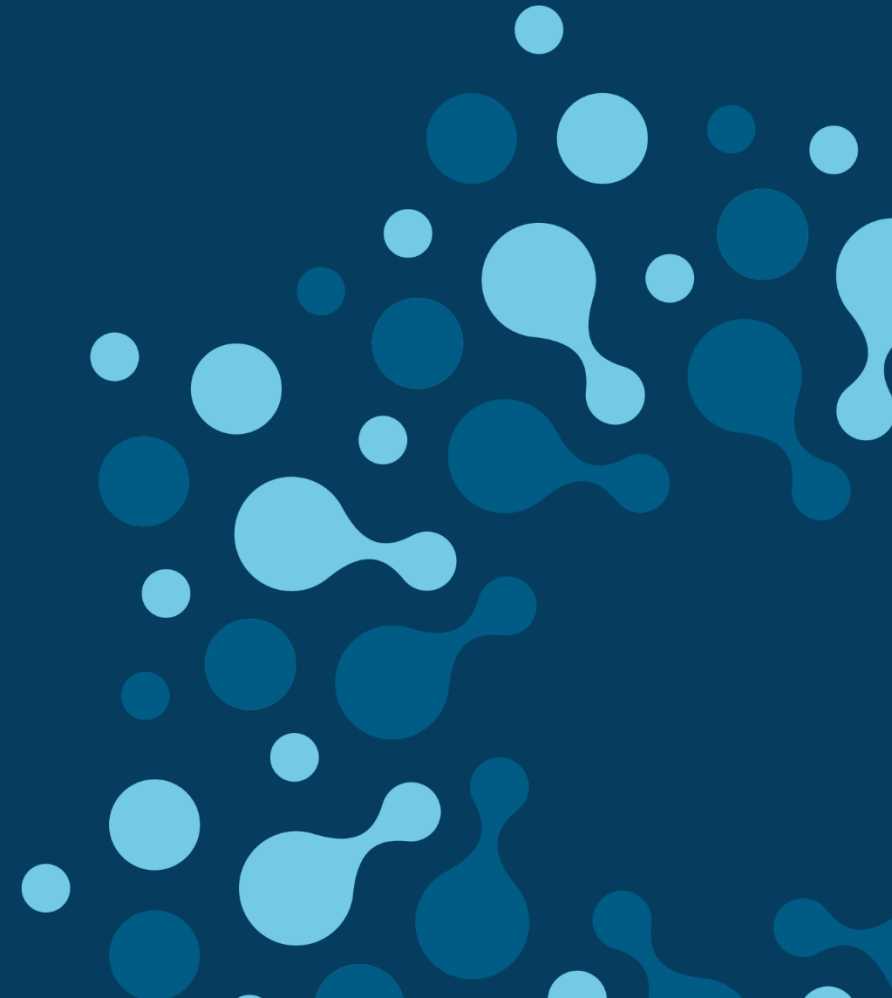
The Centre organises a regular seminar programme of research talks.

There are no forthcoming events currently listed.

Today's Programme

Dr Seb Stein

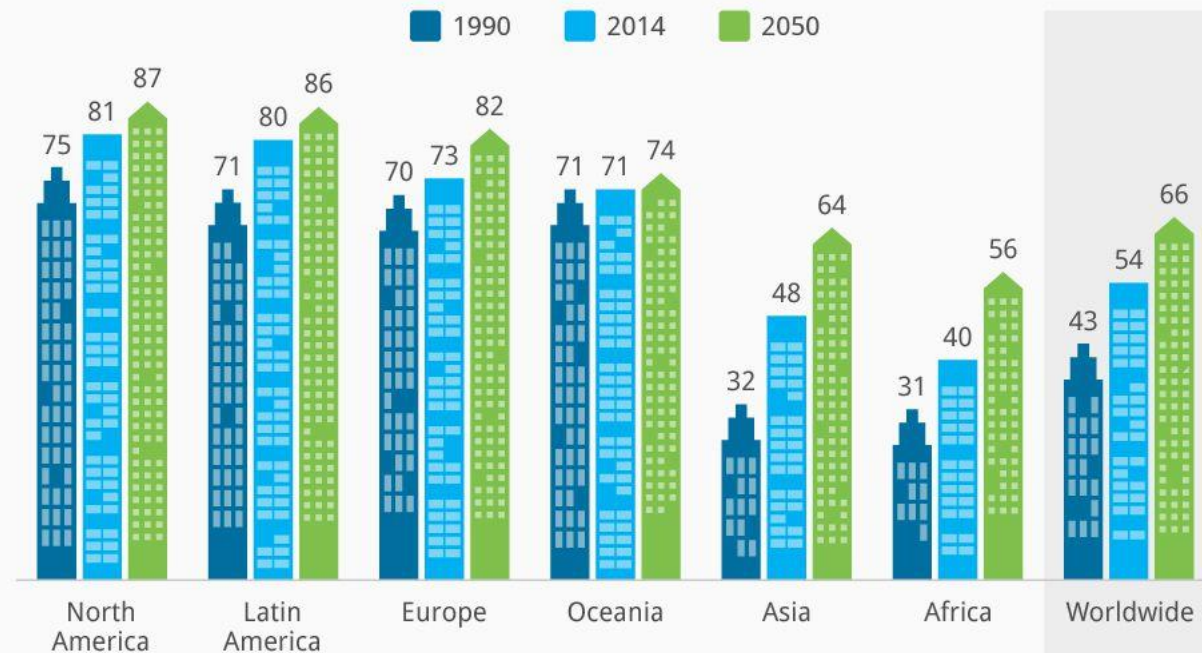
06 March 2019



Smart Cities

54% of the World's Population Now Lives in Cities

% of the population living in urban areas



Source: United Nations

Mashable statista

Many Challenges:

- Pollution
- Transportation
- Safety
- ...

Smart Cities

Opportunities for IoT:

- Sensing to help understanding
- AI for prediction and decision making
- Intelligent, decentralised infrastructure
- Intelligent transportation
- Information sharing for empowering citizens
- ...



Session 1		
14:10	Machine Intelligence for Smart Cities	<u>Prof Gopal Ramchurn</u> Head of Centre for Machine Intelligence ECS, University of Southampton
14:30	Bicycle-Based Air-Pollution Monitoring	<u>Dr Alex Weddell</u> ECS, University of Southampton
14:40	LoRaWAN – City Wide Air Quality, A Use Case	<u>Dr Steven Johnston</u> Engineering, University of Southampton
15:00	Making it Easy to Implement Secure Communications to enable Smart Cities	Andrew Poulter DSTL and University of Southampton
15:10	Smart City Testbeds for IoT Experimentation Challenges of Decentralised 5G Infrastructures and Data Interoperability	<u>Prof Michael Boniface</u> Head of the IT Innovation Centre ECS, University of Southampton
15:20	Posters, Networking, and Refreshments	

Session 2

15:50	BIM, IoT and Emerging Technology	Kevin Brown Master Inventor IBM Hursley
16:10	Opportunities for Web Science: From Local to Global	Tom Barnett Southampton Connect
16:20	Smart Cities and Transportation	John Preston Head of Transportation Research Group Engineering, University of Southampton
16:40	<title to be confirmed>	Alex Barter Barter for Things
16:50	Closing Remarks	Dr Geoff Merrett Head of the C-IoT ECS, University of Southampton
17:00	End of Event	

POSTERS

- Smart data driven cities: private harm for public good?
[Jacqueline Ayling](#)
- Efficient Networking for Intermittent and Heterogeneous IoT Sensing Devices
[Edward Longman](#)
- QROWD – Fostering data driven innovation in European cities
[Eddy Maddalena](#)
- Zero Power Water Metering
[Obaid Malik](#)
- A blockchain-based infrastructure for reliable & cost-effective IoT-aided smart grids
[Andrea Margheri](#)
- High-performance communications for smart cities – a hardware approach
[Ben Rowlinson](#)
- Textile power modules for powering wearable IoT devices in smart cities
[Sheng Yong](#)

YOUR QUESTIONS

Dr Geoff Merrett, Head of Centre

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w: www.c-iot.ecs.soton.ac.uk

