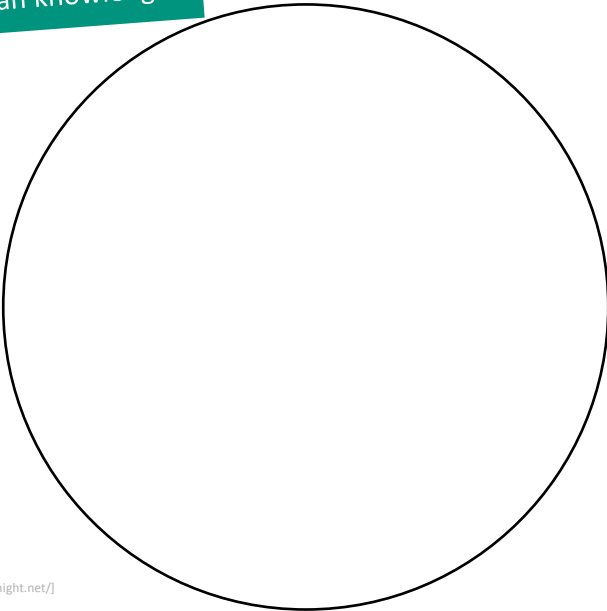


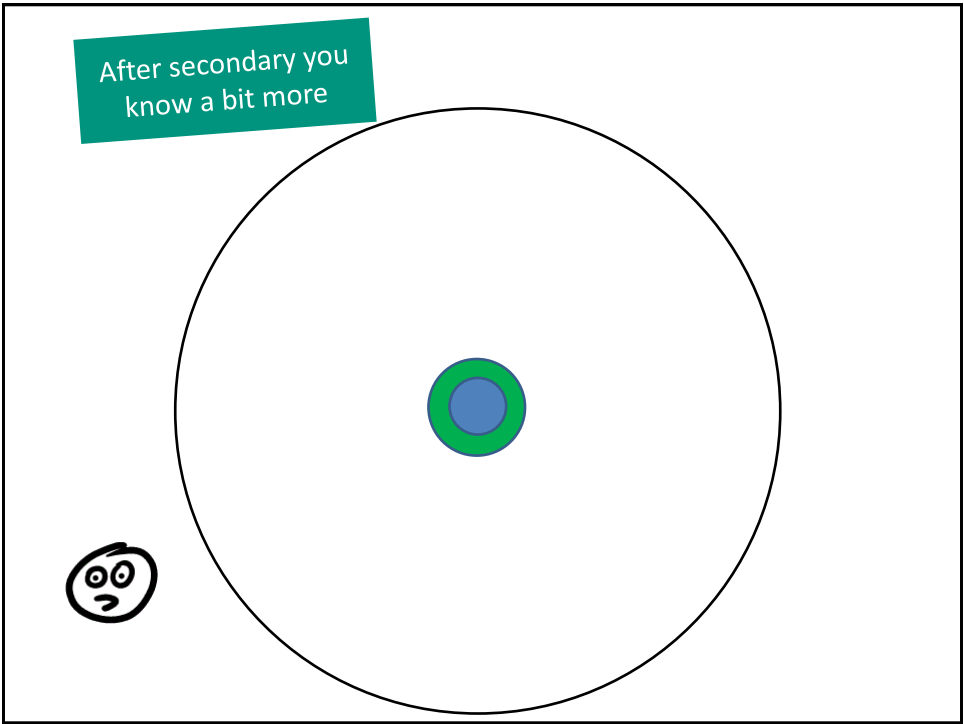
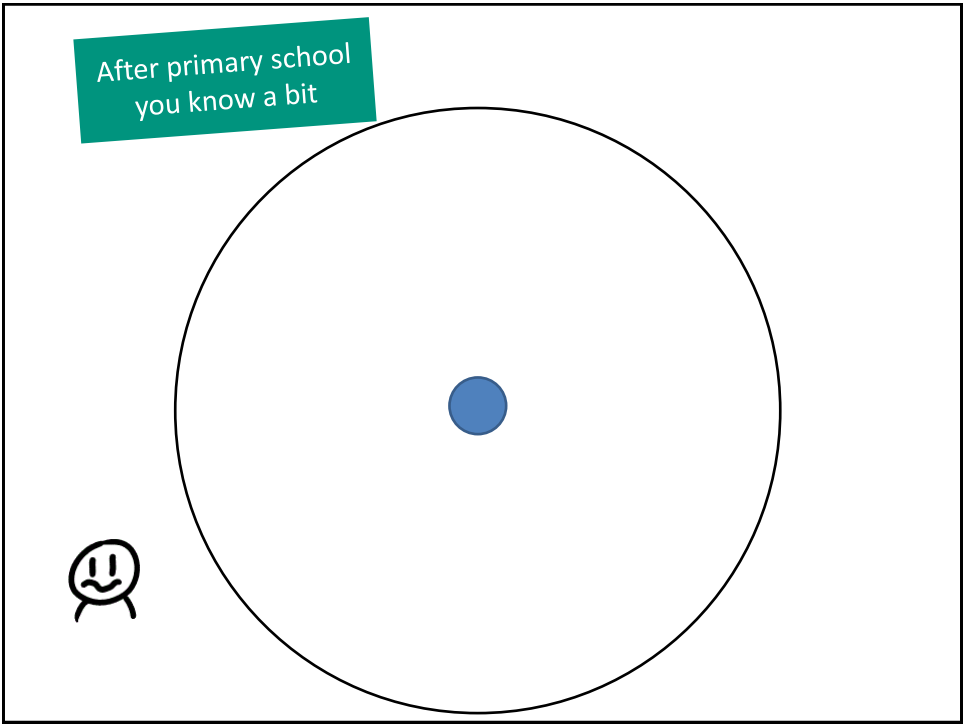
Working Together

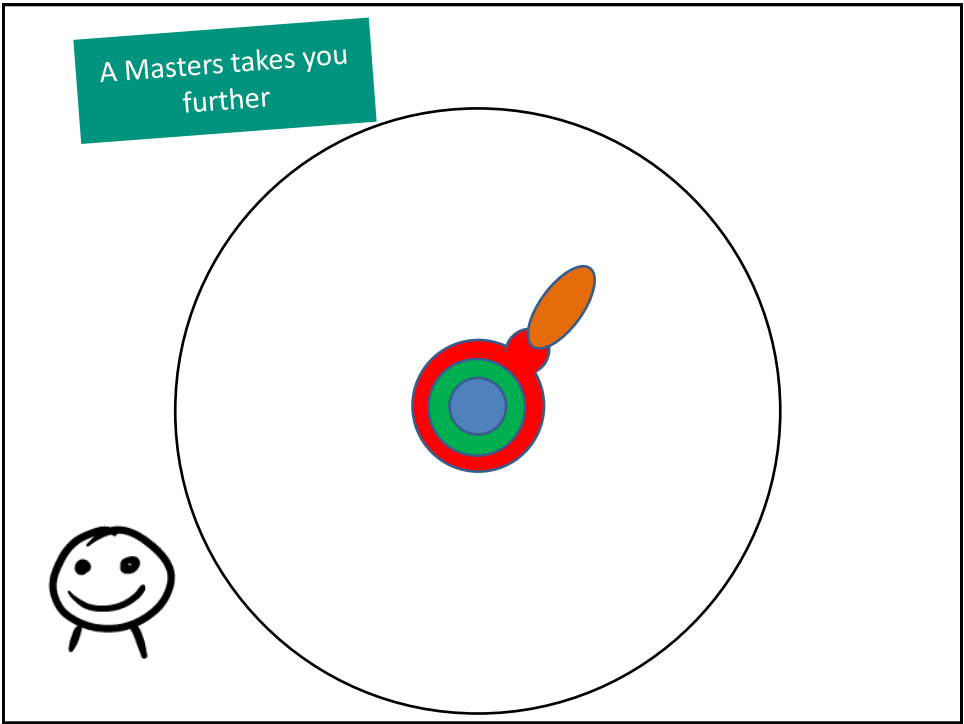
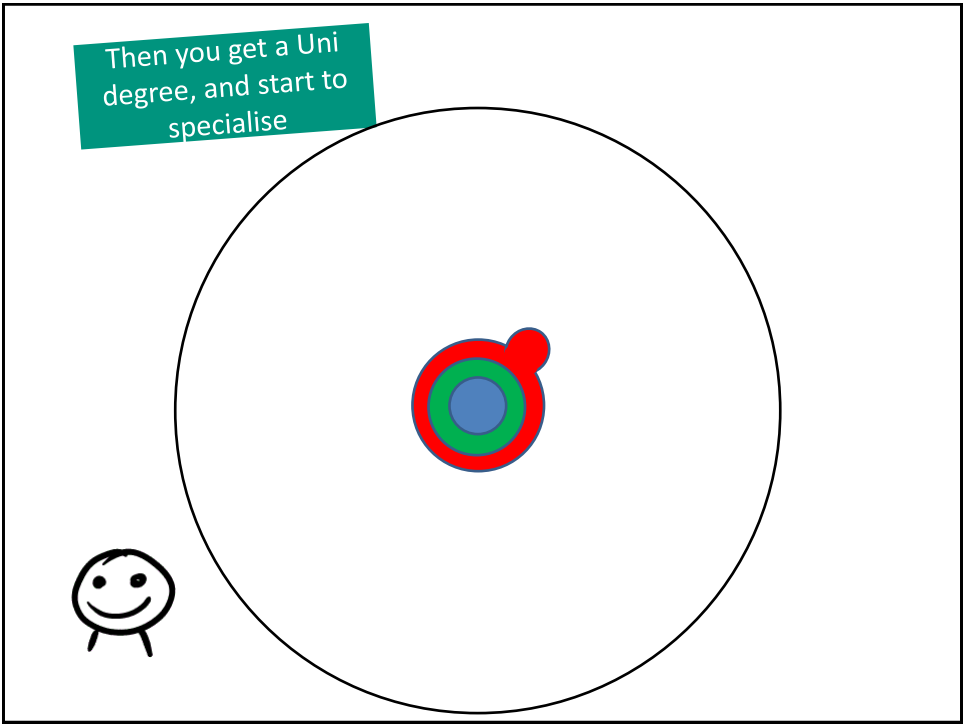
25 Feb 2014, Glasgow
Mike Chantler, Heriot-Watt, Edinburgh

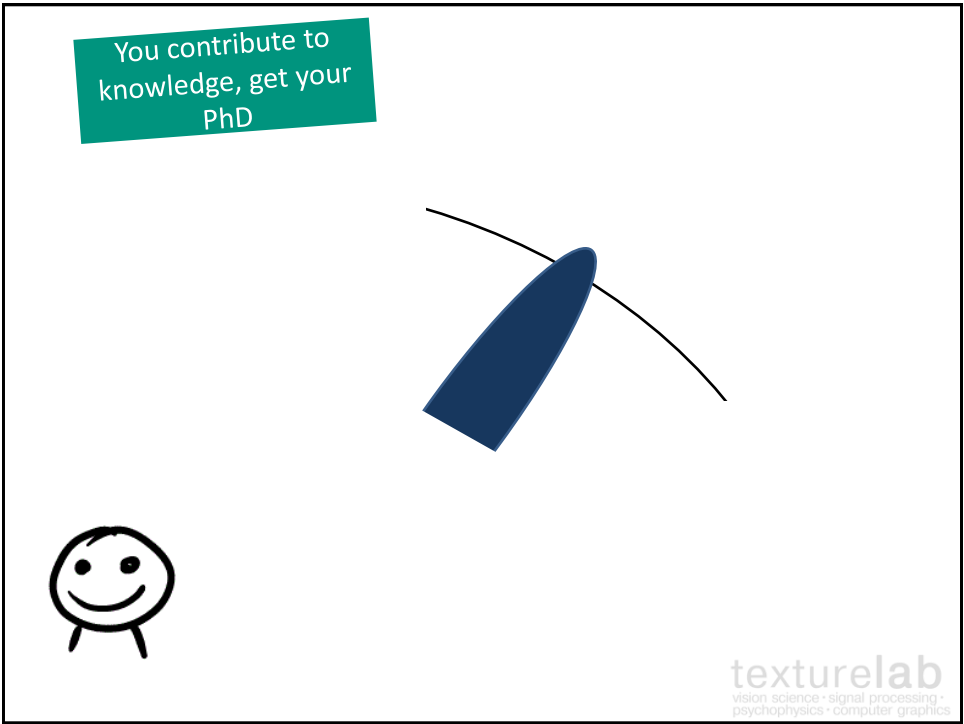
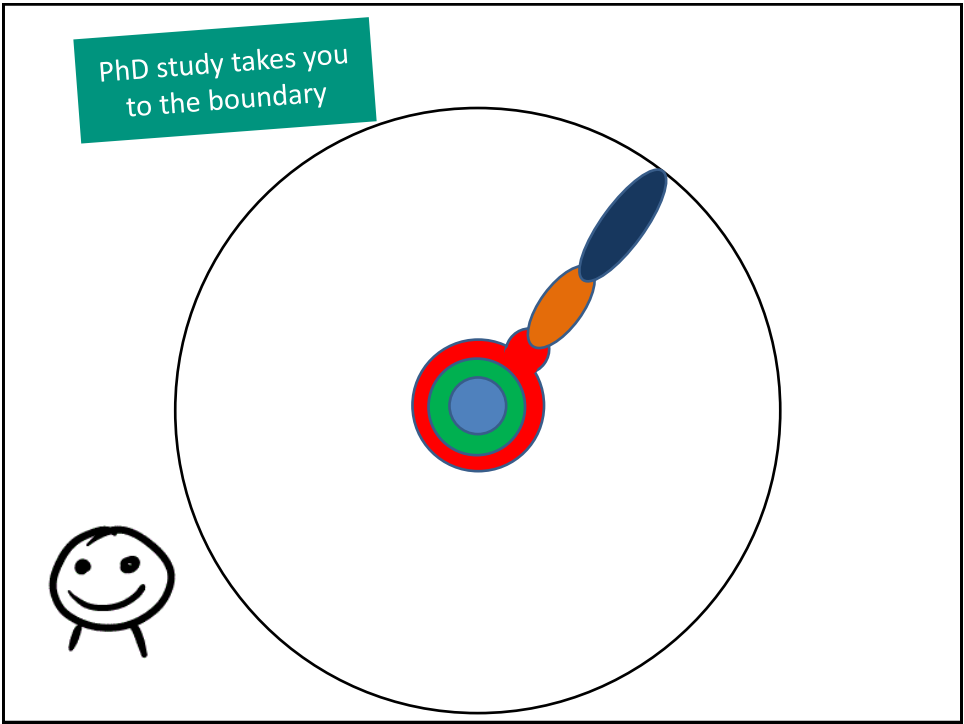
Imagine this is all
human knowledge

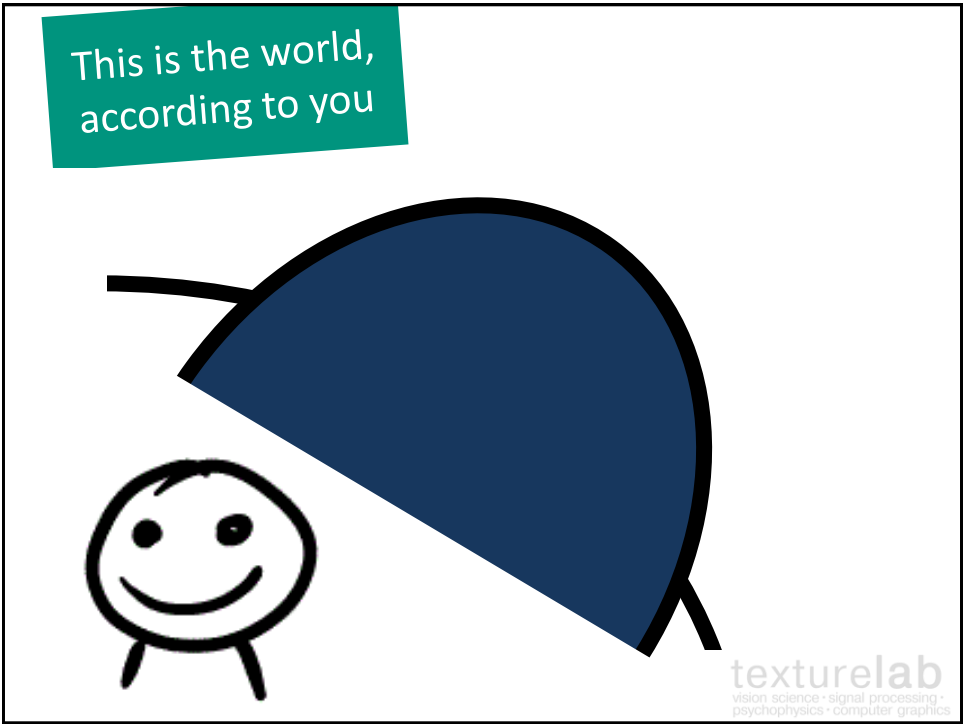
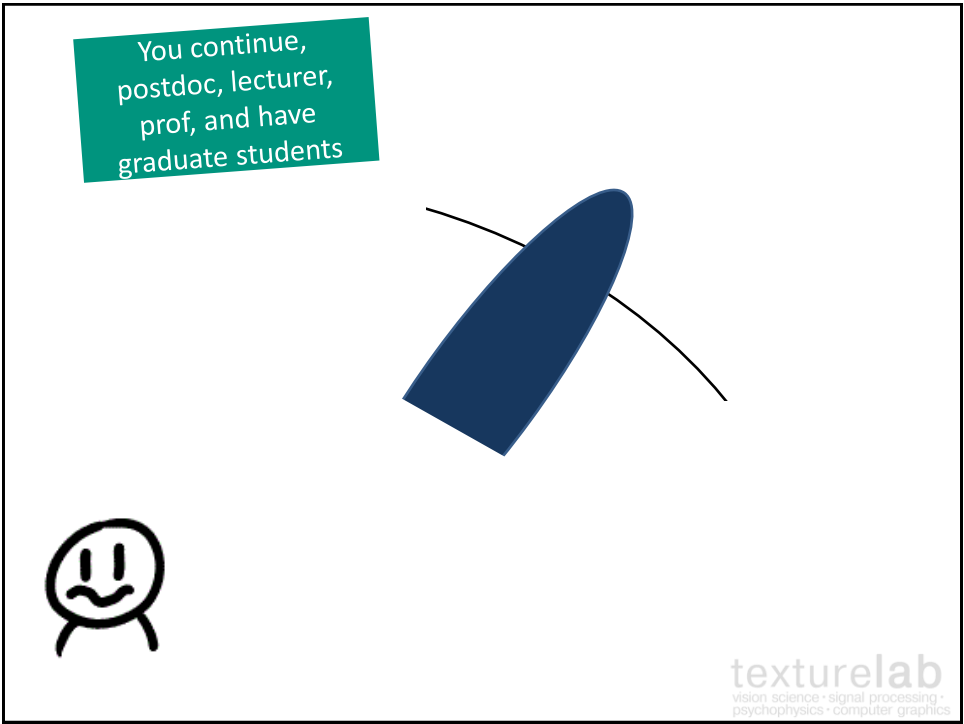


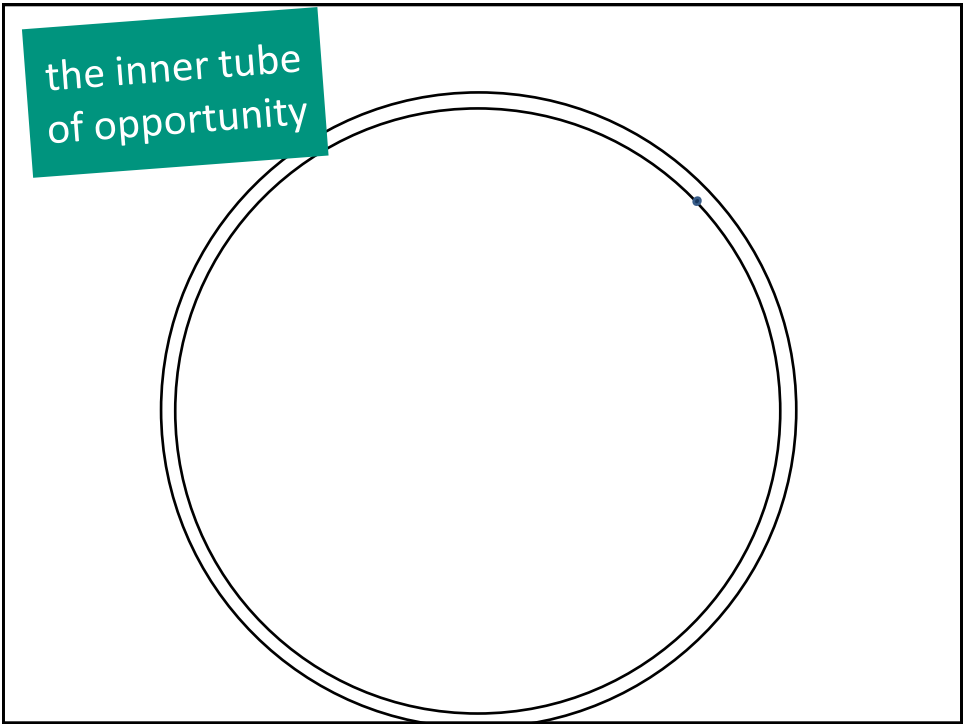
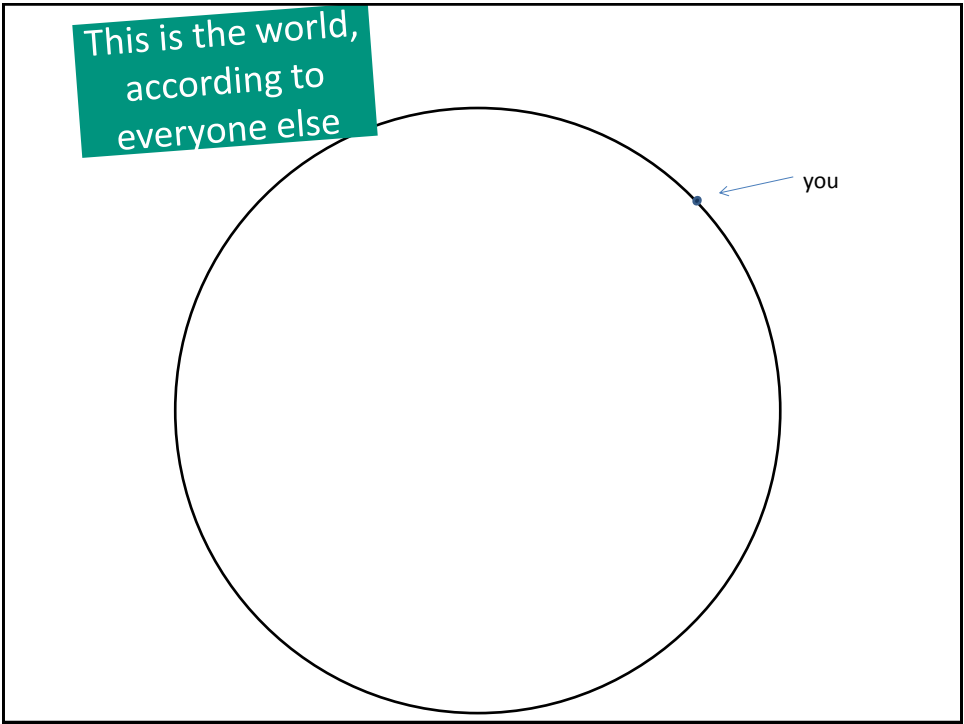
[Matt Might <http://matt.might.net/>]

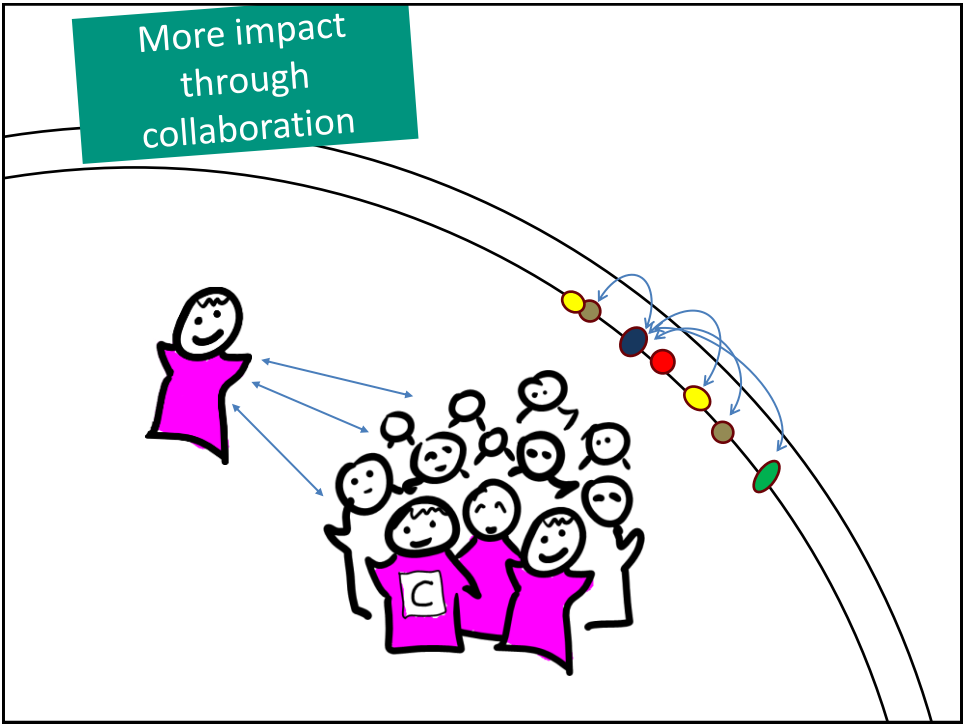




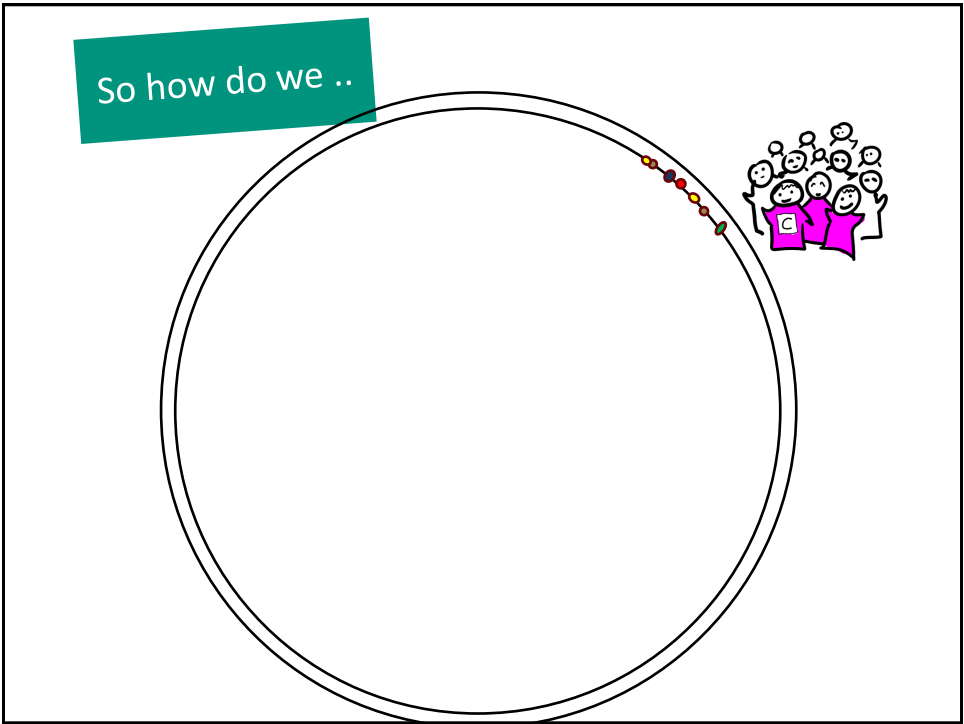
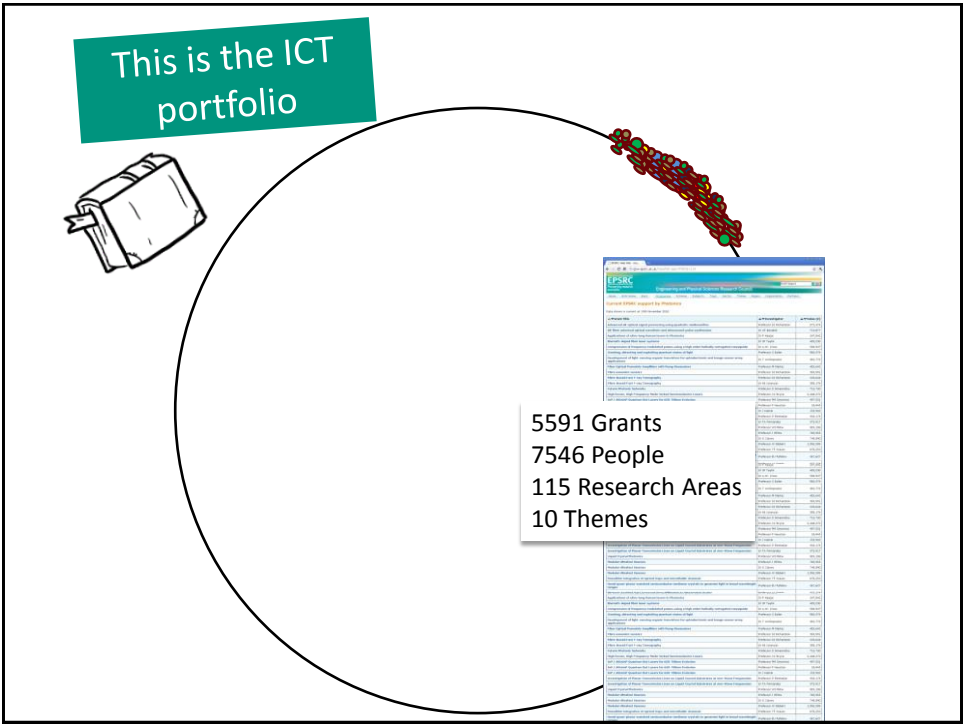








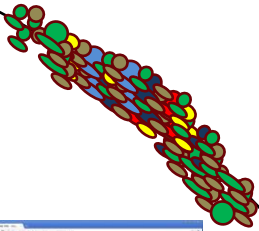


Exploring the ICT Portfolio




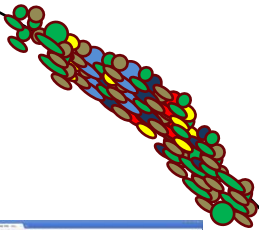
Navigate this?





5591 Grants
7546 People
115 Research Areas
10 Themes

Grants on the web



5591 Grants
7546 People
115 Research Areas
10 Themes

Generative model

EP/K002228/1 - Integrated, Market-fit and Affordable Grid-scale Energy Storage (IMAGES)

It is accepted that UK **energy networks** face a number of unprecedented **challenges** in the upcoming decades. These **challenges** include the threat to the security of **energy supply** due to declining indigenous **fossil fuel** reserves, increased reliance on imported **fossil fuel** (78% of **gas** and 50% of natural **gas** are imported, it is predicted that **gas** import will be over 80% in 2020), and planned retirement of ageing **generation capacity** over the next decade (approximately 20GW or 25% of the existing **generation capacity**); decarbonising **electricity generation** to achieve the goal of 80% reduction in CO₂ **emissions** by 2050; and coping with the future increases in **electricity demand** from electrification of transportation and space heating. To address these great **challenges**, it is recognized that the UK **energy networks** must change, strategically and the existing regulatory arrangements should be examined to check if they are fit for the purpose of future **energy network operations**.

To ensure that **power supply** closely matches **demand**, the amount of **electricity generated** must be well controlled and managed. If the balance between **supply** and **demand** is broken and the difference exceeds a critical level, the **power** system may fail and cause a regional blackout. The UK is especially vulnerable in terms of **network stability** as it has a relatively isolated small island **power network**. Currently, 80% of our **electricity** is generated from **fossil fuel** (**gas** or **coal**) with the **load**

balancing function mainly managed through **fossil fuel peaking generation plants** that respond to **load** changes. The mix of **electricity generation** in the UK will change dramatically with a large reduction in the use of **gas** and **coal** and an increase in the clean variable, intermittent **renewable energy generators**. The inherent **energy storage** capability that we currently enjoy due to our dependence on **fossil fuel power generation** will then be greatly reduced by 2030.

Solutions are needed to address the **network challenges** that will occur due to a decrease in the implicit **energy storage** available with the planned reduction in **fossil fuel power generation** and the integration of large amounts of unpredictable intermittent **renewable sources**. **Energy storage** can provide manifold values in i) help meeting of peaky large scale electrical loads, ii) providing time varying **energy** charge management, iii) allowing **renewable power generation** to be stored to alleviate intermittence, iv) improving **power quality/reliability**, v) meeting remote **load** needs, vi) storage for management of distributed **power generation**, etc. This proposed research programme will focus on the challenging technical and economic issues faced by integrating large **grid scale energy storage** with the **energy network**.

Generative model

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34%

22%

4%

source demand load supply grid power operation smart generation electricity network renewable energy distribution challenge transmission system large control

clean oil alternative sustainable efficient waste technology emission generation world production fuel energy global ga source carbon fossil demand

range electrical advanced improving life efficiency improved generation supercritical ga generating conventional flexibility coal plant power emission station

Texture Lab, Heriot-Watt University

11

Words in Context

Topic Browser Tool

You can explore any topic below by clicking on the keywords

Topic ID	Keywords
557	imaging mri image tissue medical
19	resolution imaging optical microscopy image
146	visual image video scene human
639	ray imaging image tomography resolution
182	image camera datum pixel frame

Search:

Showing 1 to 5 of 5 entries (filtered from 1,000 total entries)

Show entries

Words in Context

Topic Browser Tool

You can explore any topic below by clicking on the keywords

Keywords
imaging mri image tissue medical
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Search:

Showing 1 to 5 of 5 entries (filtered from 1,000 total entries)

Words in Context

body method scanner diagnosis tissue disease contrast brain clinical magnetic technique mr imaging image mri improve resonance

point scene observer vision camera task algorithm processing human representation image visual photograph

efficient pixel noise sensing reconstruction acquisition compressed turn frequency size framedatum image compression digital inherent rate camera region

RP Website

- 1. Topics
- 2. Grants
- 3. Investigators
- 4. Tools

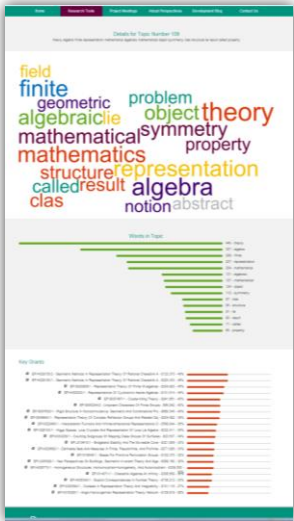
<http://researchperspectives.org>



Topics

- 1. Visualisation
- 2. Words
- 3. Key Grants

<http://researchperspectives.org>

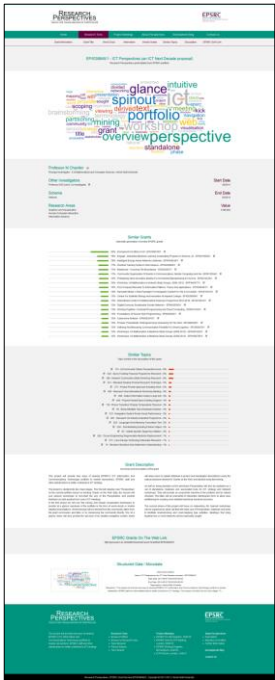


Grants

Modular design easily extended:

- 1. Visualisation
- 2. Link information
- 3. Similar grants
- 4. Similar topics
- 5. Description
- 6. GOW link
- 7. Meta Data

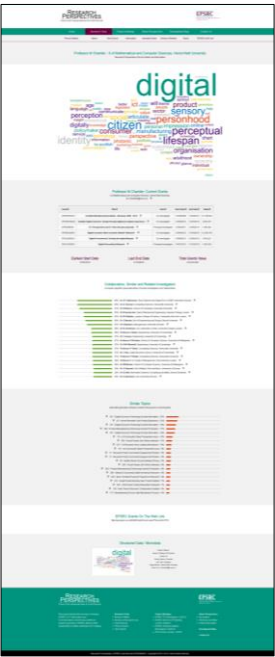
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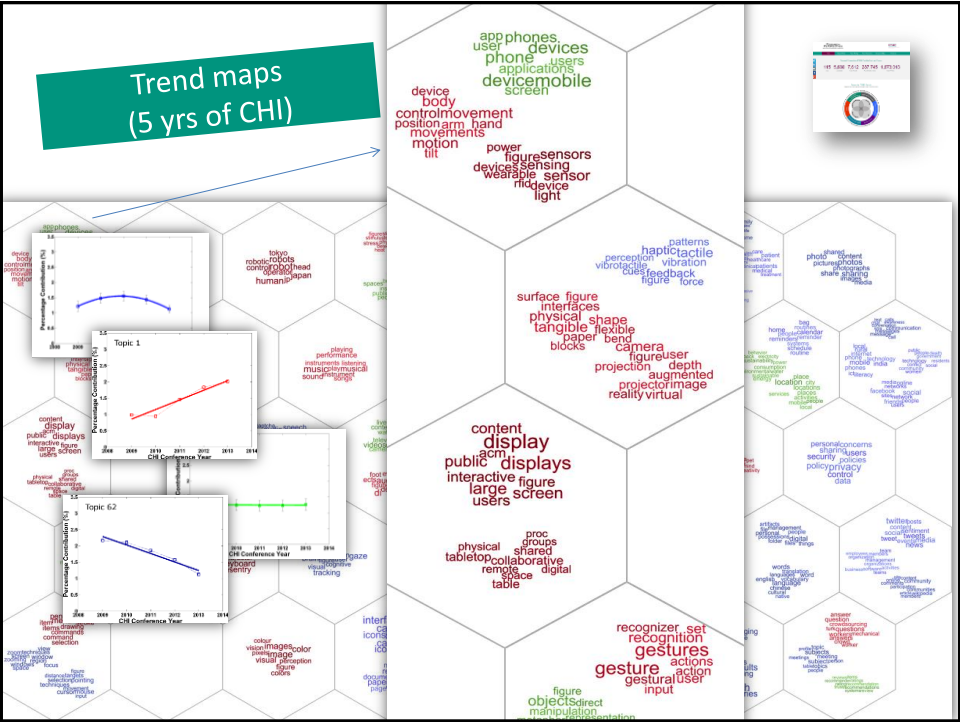
Investigators

- 1. Visualisation
- 2. Grants
- 3. Similar investigators / collaborators
- 4. Similar topics
- 5. GOW link
- 6. Meta Data

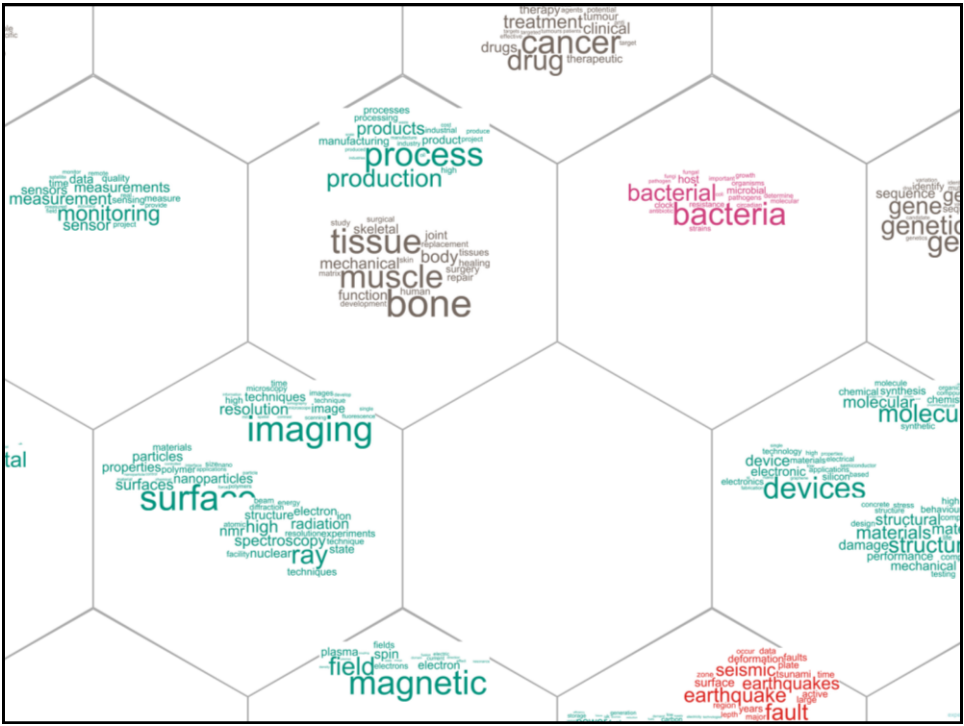
<http://researchperspectives.org>



Other things you can do with topic modelling







tools

- Portfolio visualisation
 - researchperspectives.org
- Meetings
 - www.well-sorted.org

RESEARCH PERSPECTIVES

Research Perspectives (EPSRC) Profiles Facts and Figures

115 5,680 7,612 287,745 1,673,013

Research Perspectives (EPSRC) Profiles Facts and Figures

Research Perspectives (EPSRC) Profiles Facts and Figures

Well Sorted

Organising the World

Online Card Sorting in Three Easy Steps

Sign up for your free account and get sorting

Step 1

1. 2. 3. 4.

Decide on the items you want participants to sort and create a study online

Step 2

Send a link to your participants so they can sort your items online

Step 3

See the live results and instantly create data visualisations

Well Sorted

Organising the World

Home Page Explore View Studies View Results Register Login

Online Card Sorting in Three Easy Steps

Sign up for your free account and get sorting

Step 1

1. 2. 3. 4.

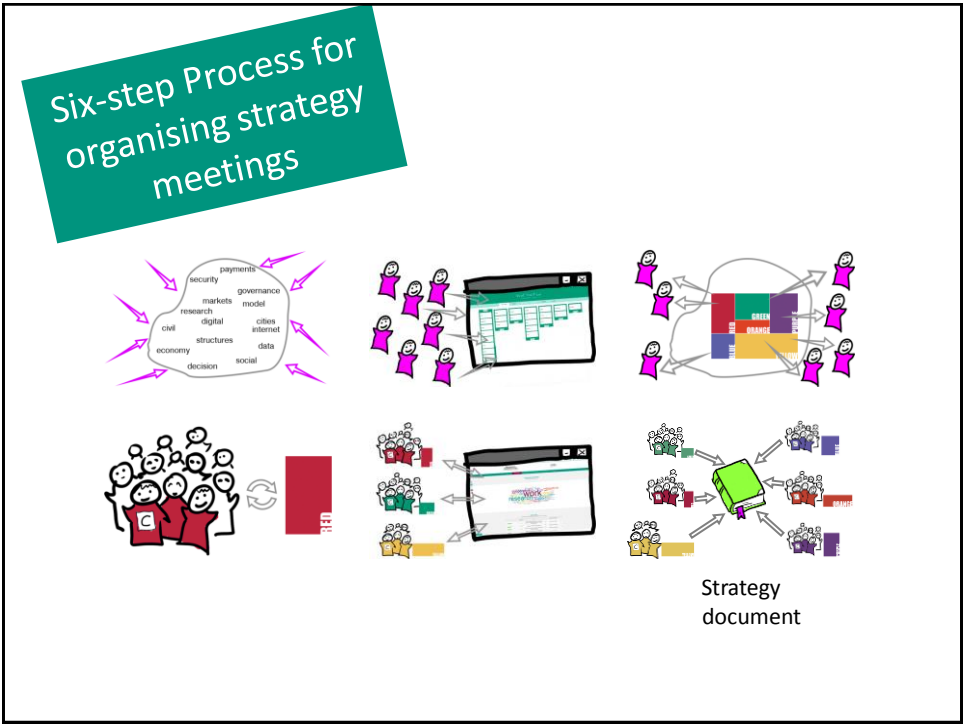
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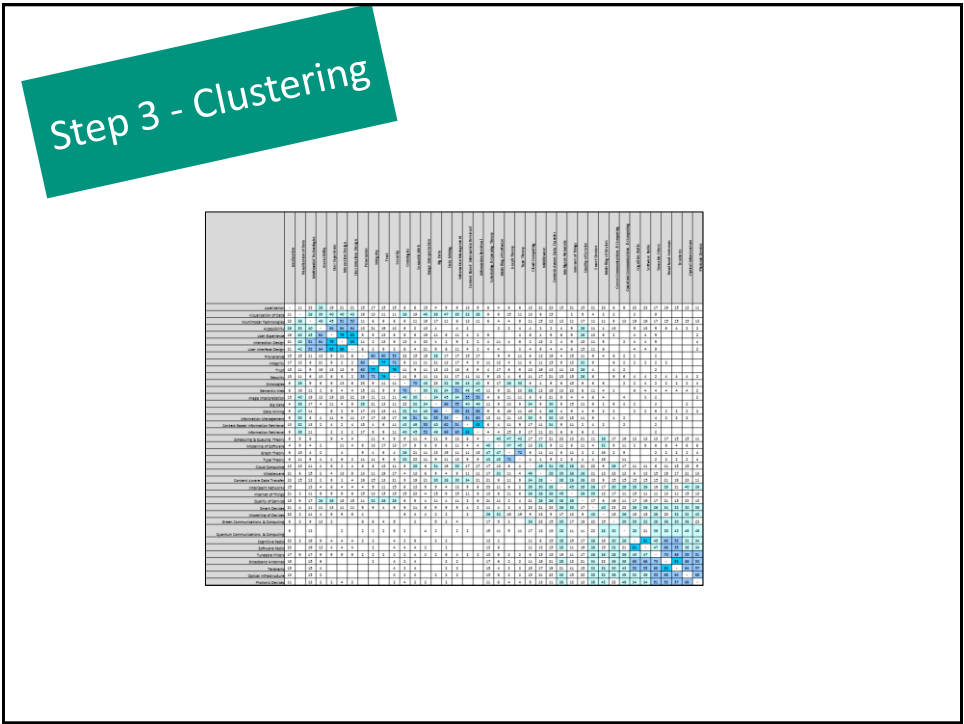
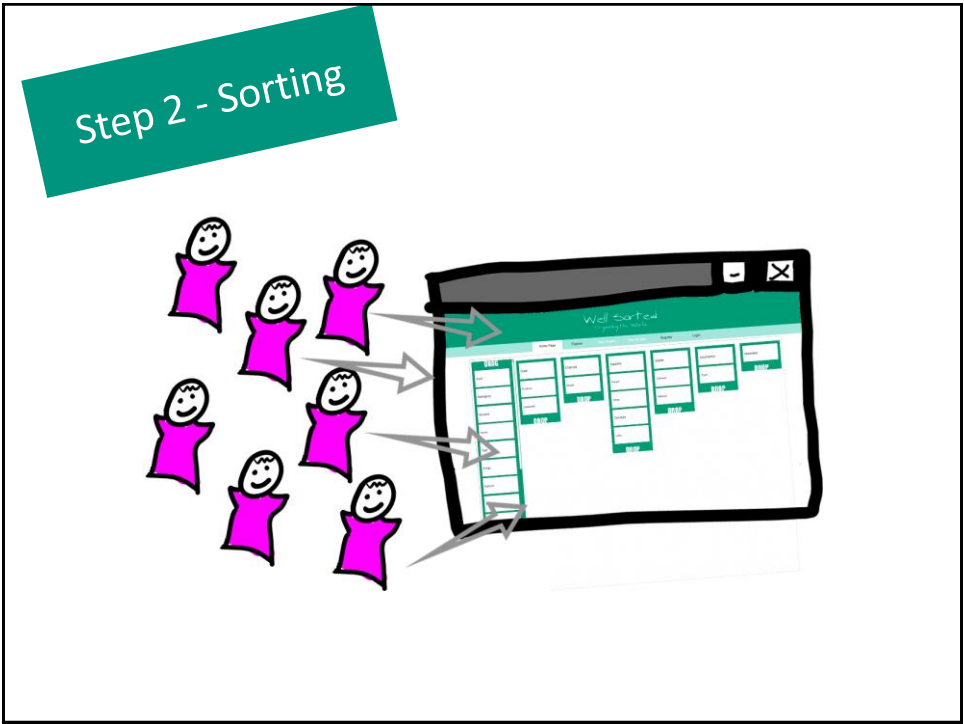
Step 3

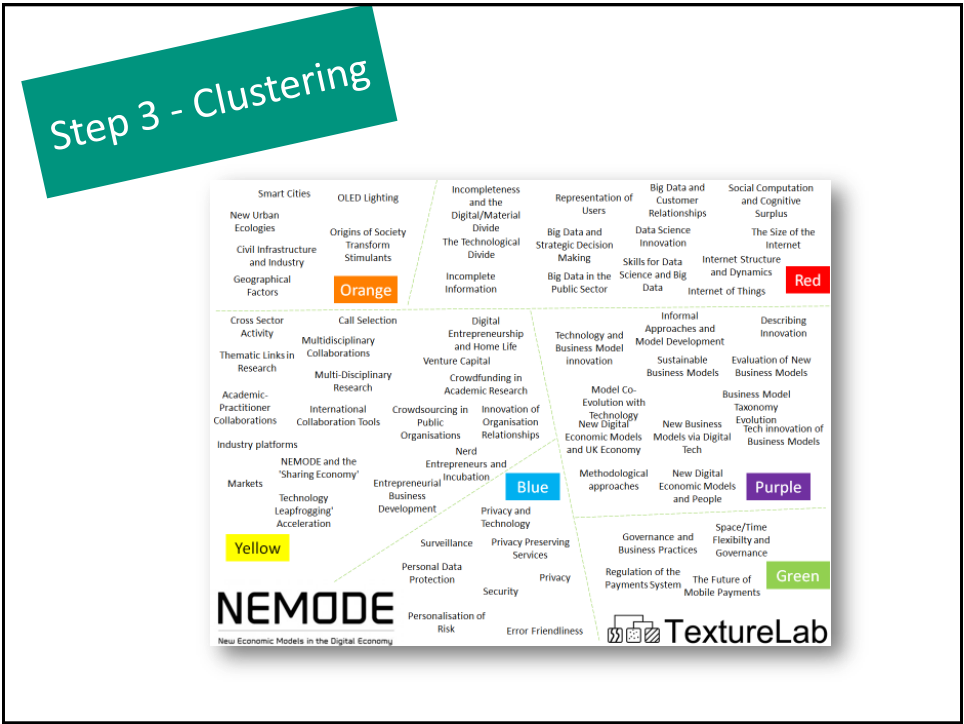
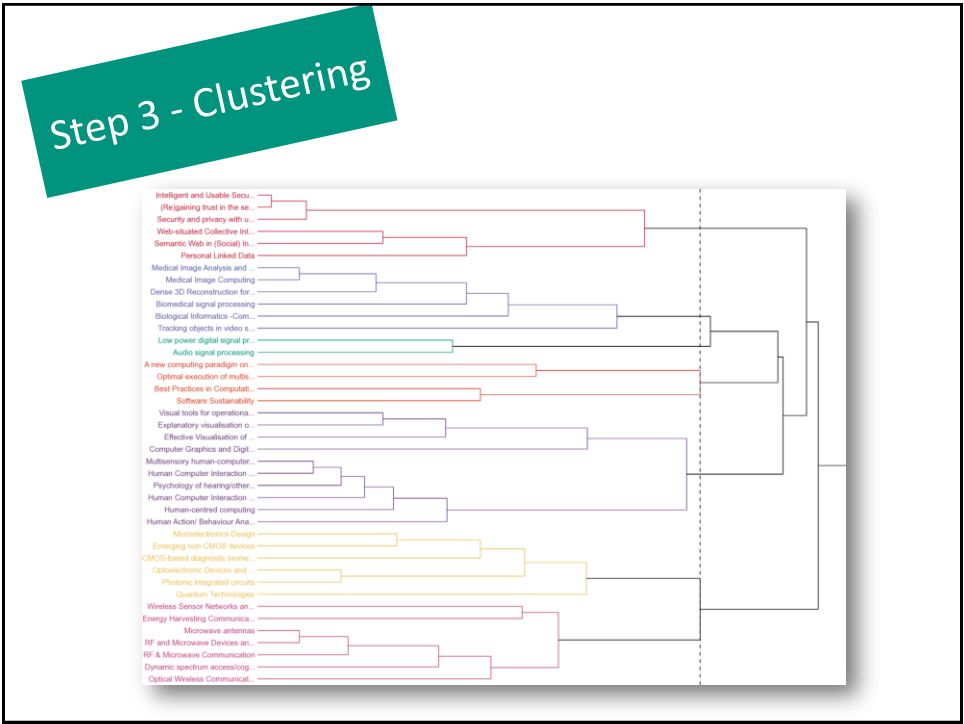
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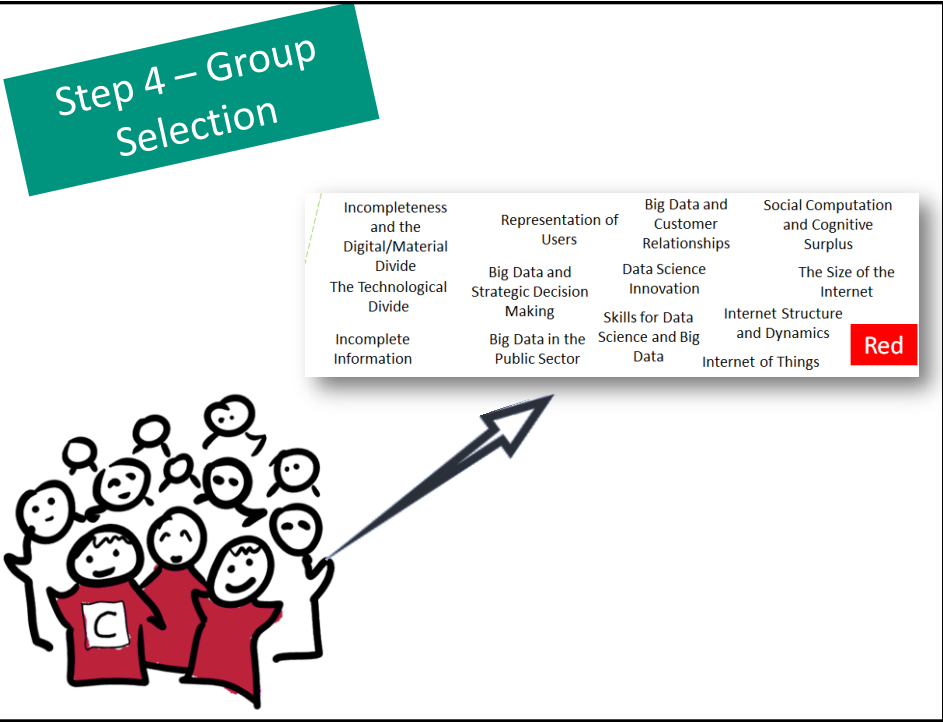


Step 1 – Idea Generation

Short Label	Full Research Topic
OLED Lighting	OLED Lighting
OLED Lighting	OLED Lighting
Origins of Society Transform Stimulants	Where do the stimulants come from to help a society transform
Geographical Factors	What factors accentuate differences geographically or that serve particular communities?
Civil Infrastructure and Industry	The role of (civil) infrastructure in creating a digital economy and how the industry can collaborate to provide insight into the future of a digital economy.
Smart Cities	Smart cities – an emerging economy
New Urban Ecologies	New urban ecologies: how to design resilient socio-technical systems, new supply chain models in an eco-industrial economy?
Methodological approaches	If business model development is systemic, what methodological approaches are suited to the digital economy ecosystem
New Digital Economic Models and People	The people management / development and skill implications of the rise and spread of innovative new digital economic models-
New Digital Economic Models and UK Economy	The implications of innovative new digital business models on the UK economic - particularly its distributive effects on the UK labour market, and the implications of that for the nature of work in the UK
New Business Models via Digital Tech	Typologies of new business models enabled by digital technologies-
Model Co-Evolution with Technology	What, when and how do business models co-evolve with technology
Tech innovation of Business Models	Business Model Innovation process and how technology innovation can be the catalyst
Technology and Business Model Innovation	Digital technology and business model innovation
Sustainable Business Models	Sustainable business models
Business Model Taxonomy Evolution	After more than a decade since the publication of Amit & Zott's (2001) seminal paper on value creation in e-business, has the taxonomy of business model themes (i.e. sources of value creation)







Step 5 –Breakout

Incompleteness and the Digital/Material Divide	Representation of Users	Big Data and Customer Relationships	Social Computation and Cognitive Surplus
The Technological Divide	Big Data and Strategic Decision Making	Data Science Innovation	The Size of the Internet
Incomplete Information	Big Data in the Public Sector	Skills for Data Science and Big Data	Internet Structure and Dynamics Internet of Things

Red

Big Data and Strategic Decision Making	How can "big data" support strategic decision making, for instance at board level in organisations?
The Size of the Internet	How big is the internet? What metrics are appropriate and how can we reconcile publicly available indicators such as traffic through internet exchanges with commercial trends such as traffic contained in content delivery networks (CDNs) and other private and commercial networks?
Internet Structure and Dynamics	What is the structure and dynamics of the internet and how does it change?
Social Computation and Cognitive Surplus	How can we use social computation to access cognitive surplus, third actor and informal actors to enable co-production of a range of services (e.g. Health and Care)?
The Technological Divide	I would like to see the NEMODE agenda contribute towards bridging the widening technological divide between the least developed countries (LDCs), the emerging economies and the technologically advanced countries.
Incompleteness and the Digital/Material Divide	How does incompleteness span the digital/material divide?
Incomplete Information	In a material world of incomplete or malleable artefacts and services, is there a corresponding world of incomplete information and how does this provide a platform for design, experiment and production of such goods and services?
Representation of Users	Representation of users
Data Science Innovation	Data science, innovation and business productivity
Skills for Data Science and Big Data	Skills for data science and big data

Step 5 - Gateway to Research Data

Relevance	Project	Topic	Link
55.52%	ESRC	The Big Society, Localism & Housing Policy	#
54.55%	STFC	Big Science - Big Telescopes	#
54.09%	STFC	Connecting Early Universe Physics to Modern Advances in Observational Astronomy	#
53.92%	STFC	Branes, Strings and Defects in Cosmology	#
53.87%	STFC	Astronomy and Cosmology with the Planck Experiment	#
53.61%	STFC	Theory from the Planck Experiment	#
53.61%	NERC	Assessing the size of explosive super-eruptions: how big is big?	#
53.09%	STFC	Twistor String Theory and Time-dependent Backgrounds	#
52.91%	STFC	PATT Linked Grant Support for the Bristol Astrophysics Group	#
52.91%	STFC	Project support for the Wide Angle Search for Planets	#

Step 5:
output

Big and Open Data

NEMODE
the Economic Models in the Digital Economy

TextureLab

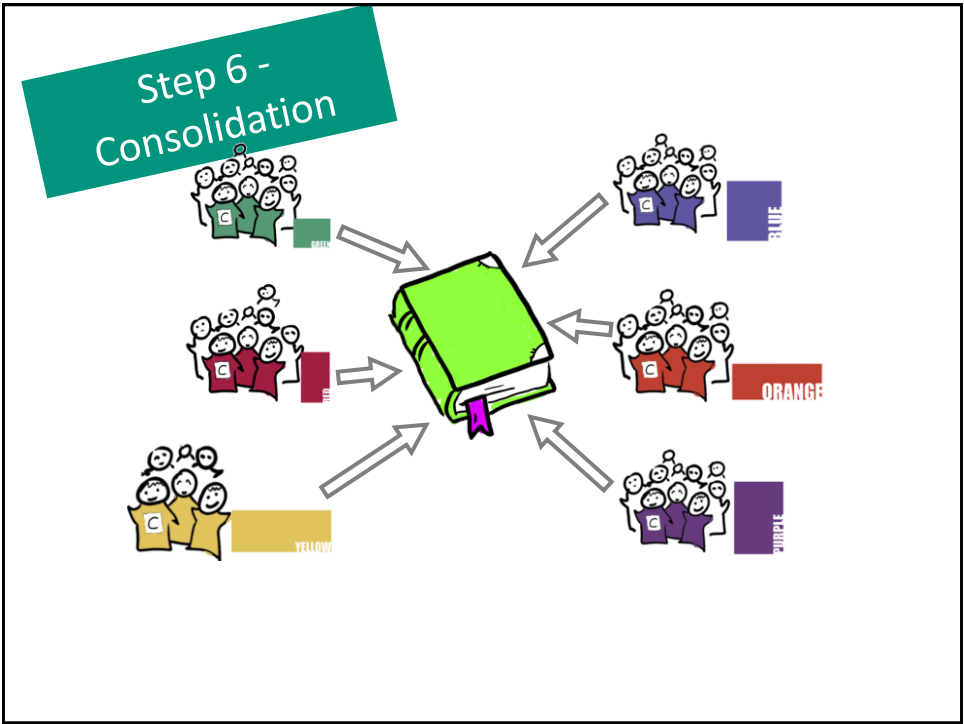
Raconteur Name: [Richard Vidgen](#)
Raconteur Email: r.vidgen@hull.ac.uk

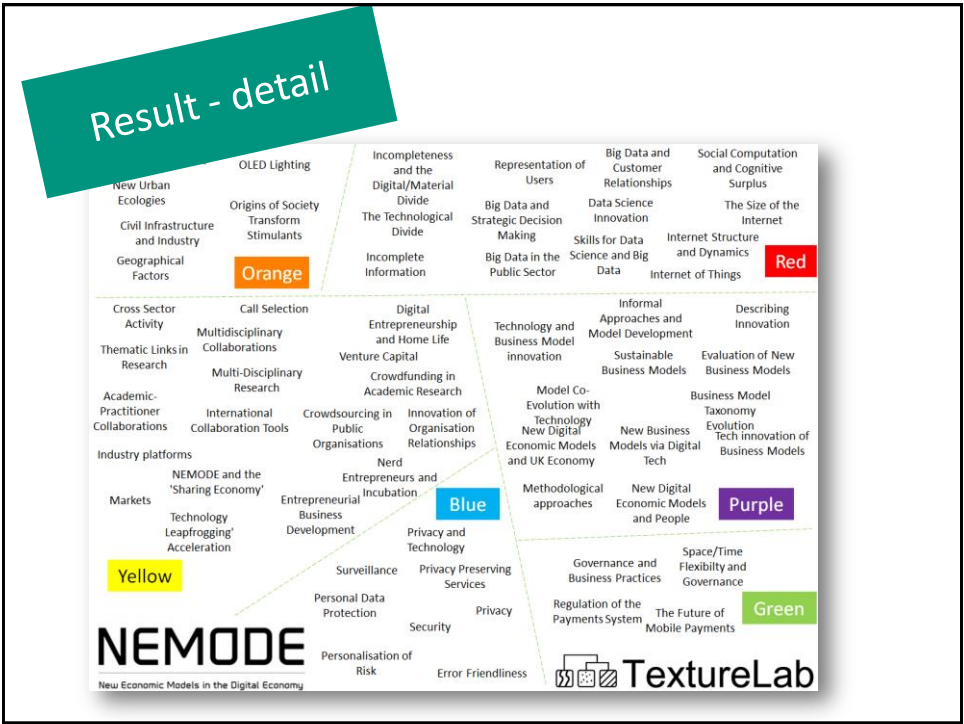
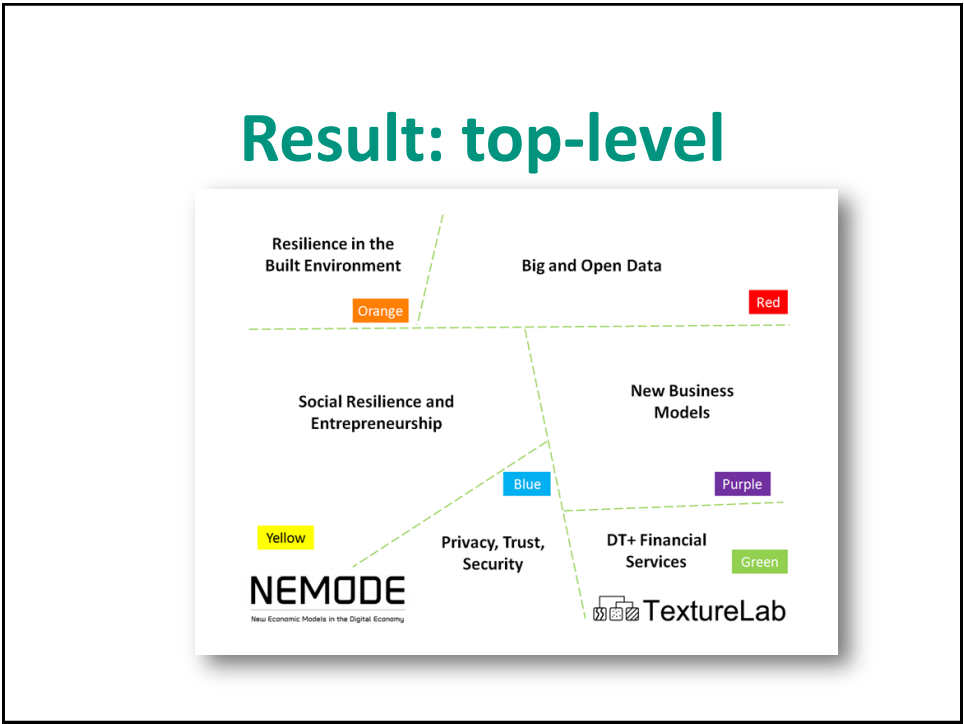
Group Members:
[Richard Vidgen](#) [Nina Marshall](#)
[Hasan Bakhshi](#) [Carla Bonina](#)
[Maureen Meadows](#)

Research Question #1:
What is the value to the UK of open data?
• Value and benefits in terms of economic, social, political and environmental dimensions
• Issues, tensions, and challenges for the nation, organisations and citizens

Research Question #2:
What skills and capabilities do UK organisations need to create value from 'big data'?
• Value of impact on: UK organisations and their business models; creation of new and skilled jobs (e.g., data scientist); and the competitiveness of the UK economy
• Scope includes all stages of big data management, e.g., data collection, data analysis, using big data for business operations, using big data in strategic decision-making...
• Implications for training, education, and policy

Research Question #3:
What are the opportunities and ethical challenges for randomised controlled experiments (RCTs) around 'big data'?
• We predict that public and private sector organisations will make greater use of big data to run RCTs to test business and public sector offerings
• Although RCTs are a powerful way of getting evidence about what works they also raise ethical concerns: firstly, about the conduct of the RCT itself, and secondly, about how RCT data is used to guide business and policy decisions





Research questions

Big and Open Data

NEMODE
The Economic Models in the Digital Economy

TextureLab

Raconteur Name: [Richard Vidgen](#)

Raconteur Email: r.vidgen@hull.ac.uk

Group Members:

[Richard Vidgen](#)
[Hasan Bakhshi](#)
[Maureen Meadows](#)

[Nina Marshall](#)
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- Issues, tensions, and challenges for the nation, organisations and citizens

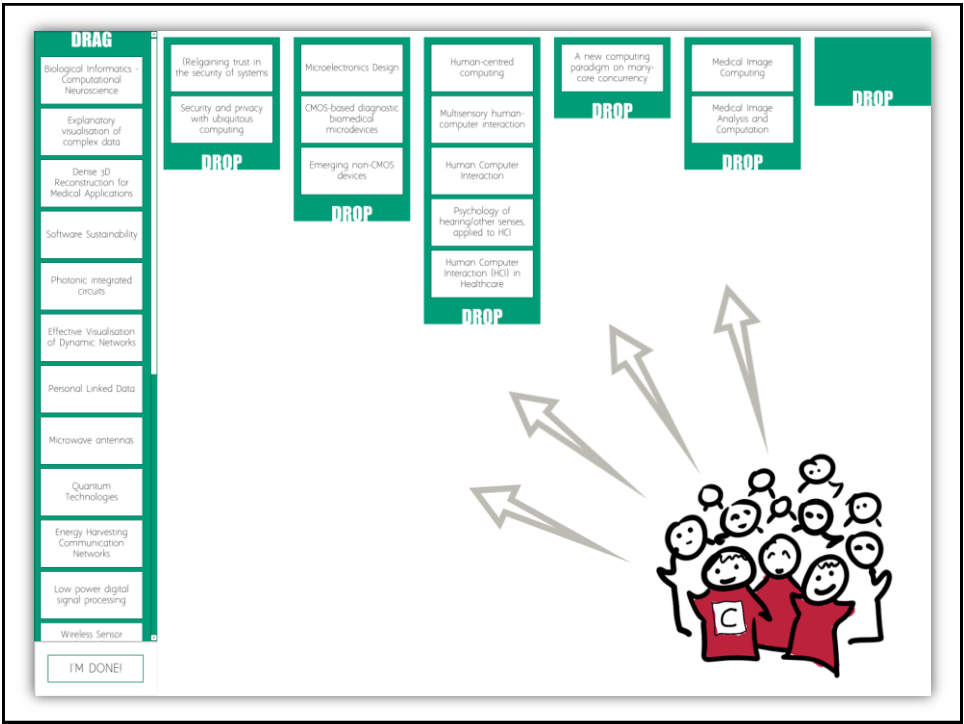
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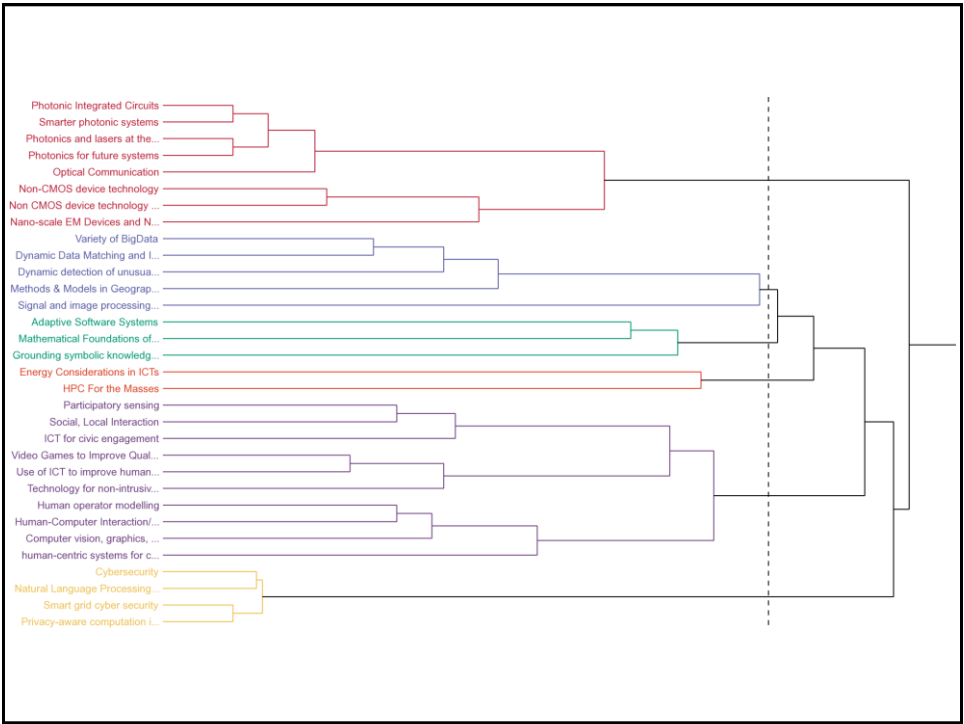
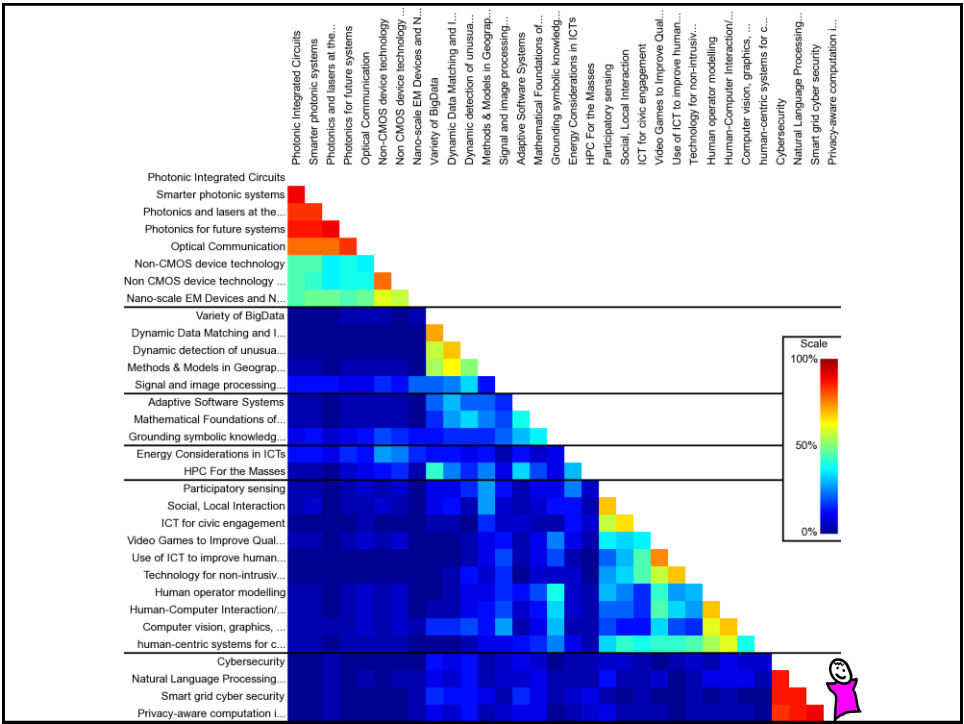
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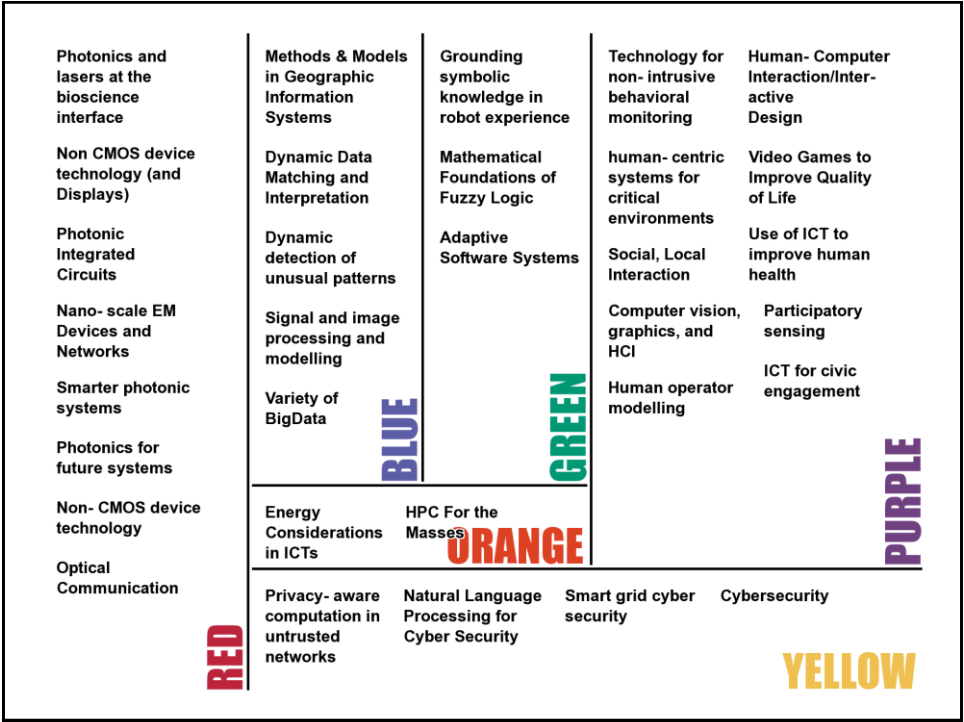
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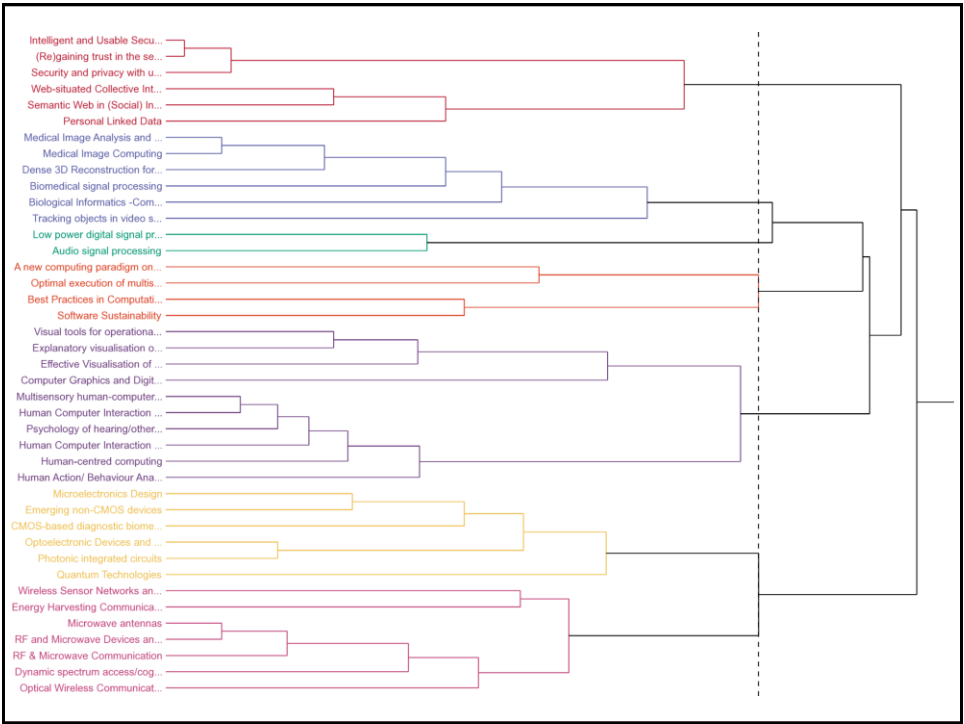
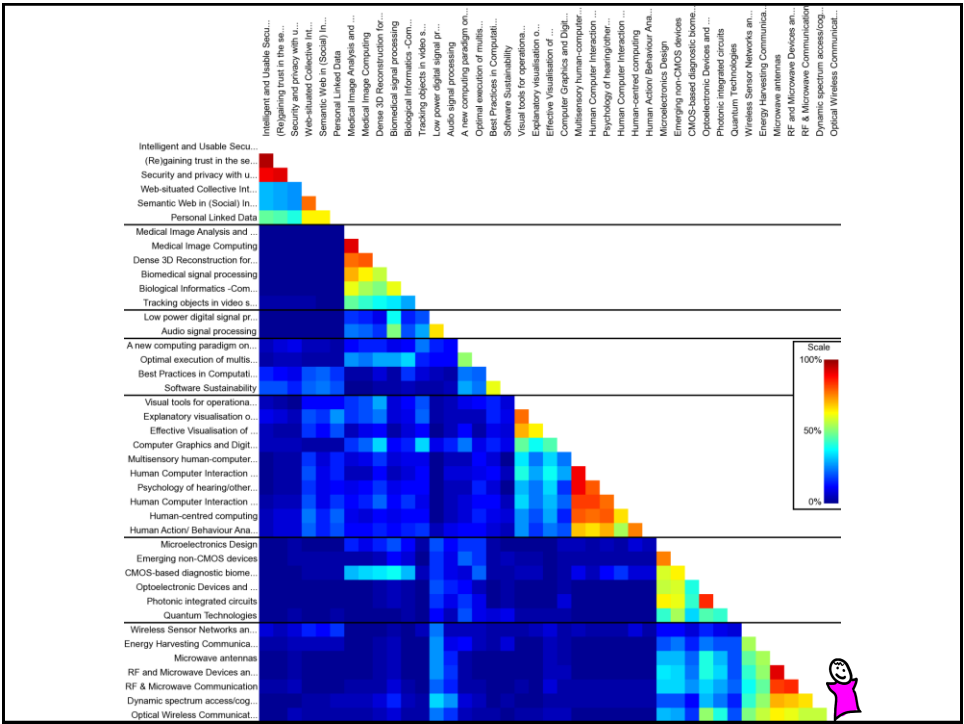
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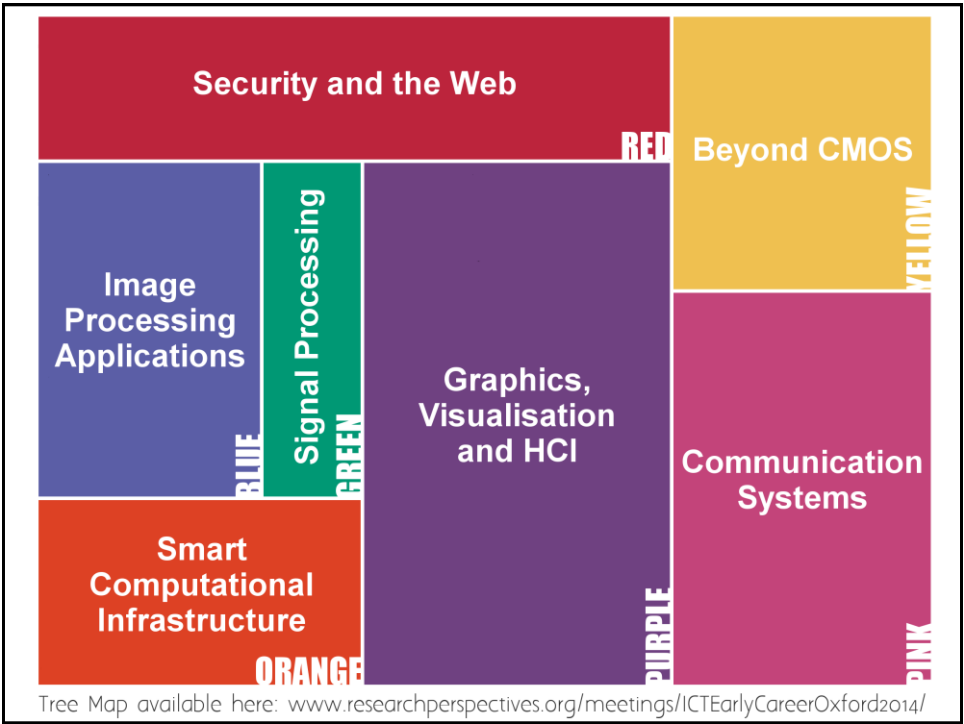
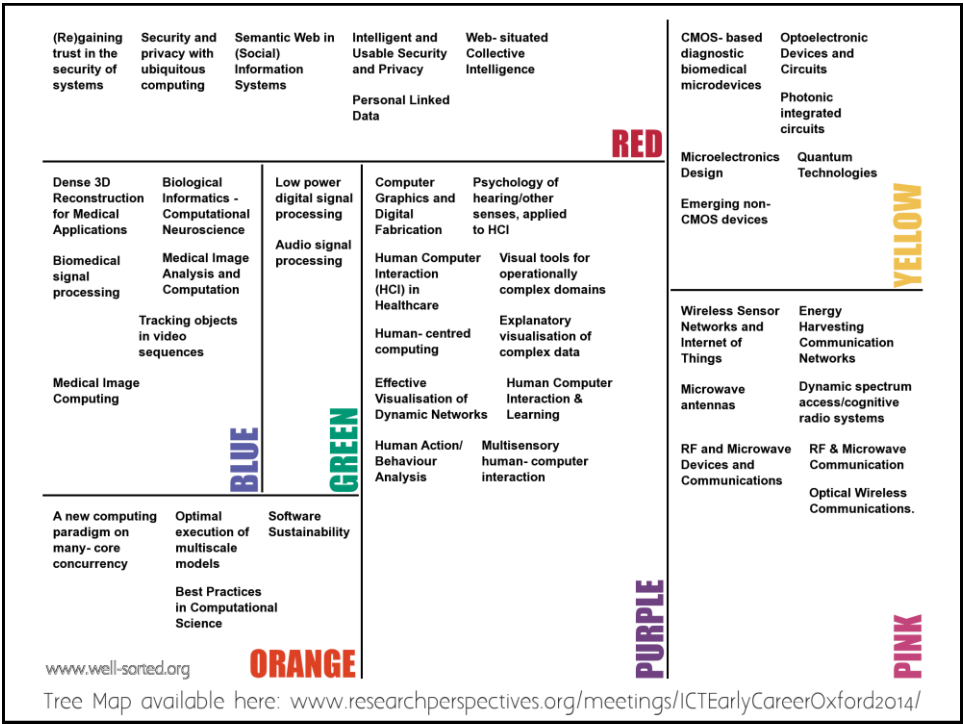






Oxford Results





Networking

Photonics and lasers at the bioscience interface	Methods & Models in Geographic Information Systems	Grounding symbolic knowledge in robot experience	Technology for non-intrusive behavioral monitoring	Human-Computer Interaction/Interactive Design
Non CMOS device technology (and Displays)	Dynamic Data Matching and Interpretation	Mathematical Foundations of Fuzzy Logic	human-centric systems for critical environments	Video Games to Improve Quality of Life
Photonic Integrated Circuits	Dynamic detection of unusual patterns	Adaptive Software Systems	Social, Local Interaction	Use of ICT to improve human health
Nano-scale EM Devices and Networks	Signal and image processing and modelling		Computer vision, graphics, and HCI	Participatory sensing
Smarter photonic systems	Variety of BigData		Human operator modelling	ICT for civic engagement
Photonics for future systems				
Non-CMOS device technology	Energy Considerations in ICTs	HPC For the Masses		
Optical Communication	Privacy-aware computation in untrusted networks	Natural Language Processing for Cyber Security	Smart grid cyber security	Cybersecurity

RED


BLUE

GREEN

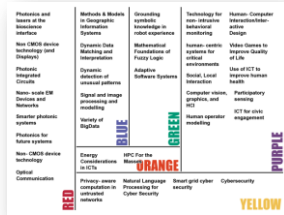
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PURPLE


YELLOW

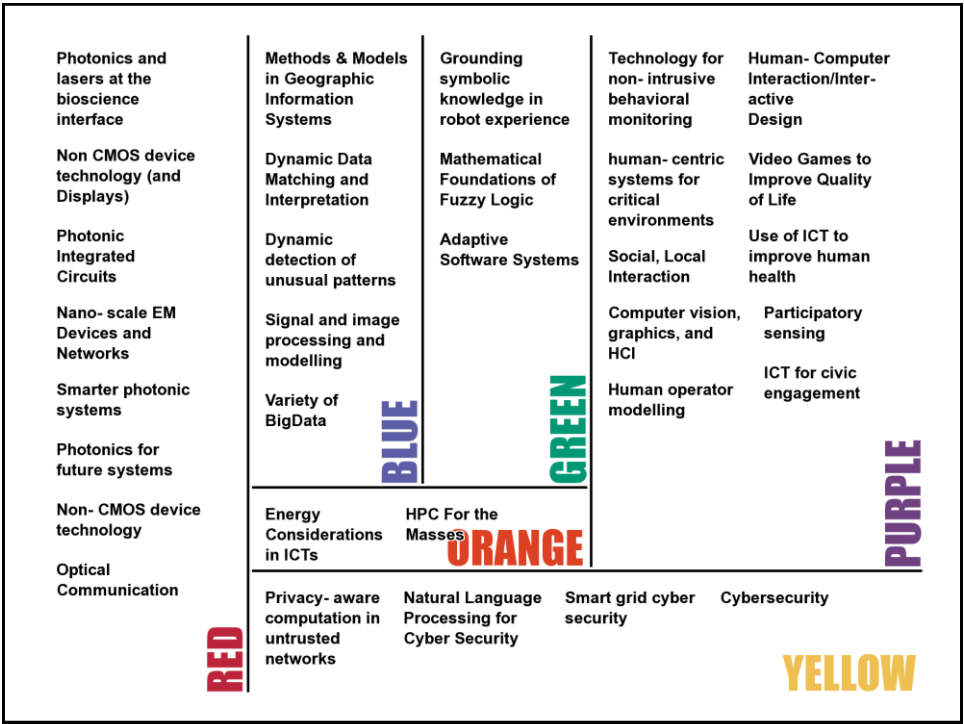


Meeting record




Paper Surveys!





This Meeting

- Provide an overview of interests
 - Illustrate the wide variety of ICT research to attendees
- Ice breaker
- Networking tool and reference
- List of experts
- Provide EPSRC with snapshot of up-and-coming research capability



Suggestions

- Explore
 - GOW, GTR, researchperspectives.org
- Meet lots of folk
 - decide quickly if you can work with them
 - explore **dual complementarities**
 - be polite
 - treat everyone is a potential speaker/reviewer ;)
- Remember the innertube of opportunity
 - Look at other complementary communities
 - **but** maintain your publishing base
- Use the groups diagram
- Organise events
 - and use our tools



Results



Tom Methven
<http://www.well-sorted.org/>



Group Colour	Group Members	Description
Red	Photonic Integrated Circuits	Photonic Integrated Circuits, developed in III-V, Si and polymer platforms, allow for reconfigurable circuit designs. With maturing technologies, applications in all-optical signal processing, quantum optics and microwave photonics can be envisaged.
	Smarter photonic systems	I am interested in laser & subsystems specifically those with integrated smart software based control to enhance their versatility. And novel laser design to address a wide range of requirements facilitated by fast electrical control of the laser output.
	Photonics and lasers at the bioscience interface	OPTICAL DEVICES AND SUBSYSTEMS: My research interest lies at the interface of Photonics, Nanotechnology and the Life Sciences in order to develop novel device architectures for applications in bio-sensing and scientific instrumentation.
	Photonics for future systems	Highly interested in high speed optical clocking for data centres and ultrafast photonics for biomedical applications
	Optical Communication	My research focuses on free-space optical (optical wireless) communication but I am also interested in fiber-optic or quantum communication.
	Non-CMOS device technology	Flexible and Printable Electronics; new device or circuit concepts and architectures on flexible substrates; More than Moore
	Non CMOS device technology (and Displays)	Design and optimisation of emerging technological applications using multi-scale materials modelling + Phase-change materials for computing, memory, and data storage + Quantum dot based organic light-emitting diodes for display and lighting + Other?
	Nano-scale EM Devices and Networks	It is generally accepted that molecular communication is the most promising method to transfer information between nano-devices when it comes to bio-applications. But is there any possibility to adopt the electromagnetic (EM) communication paradigm?
Blue	Variety of BigData	Volume, Velocity and Variety are the BigData challenges. Volume and velocity can be solved through technology. The variety dimension requires social as well as technical solutions. http://ow.ly/sZUjB . We need solutions for linking and integrating data.
	Dynamic Data Matching and Interpretation	Dynamic integration of mismatched data; failure-driven ontology matching; effective use of large data from disparate sources; timely communication and collaboration between diverse organisations during disasters.
	Dynamic detection of unusual patterns	A wide range of real-world problems, such as propagation of infectious disease, smart meter data analysis and financial forecasting, are facing common challenges in extracting and identifying unusual patterns in "real time" from complex data streams.
	Methods & Models in Geographic Information Systems	I am interested in how novel datasets can be combined with analytics and visualizations to uncover unforeseen patterns in geographic phenomena. I use geographic information systems to study social and environmental problems at a variety of spatial scales.
	Signal and image processing and modelling	Computational solutions based on signal and image processing and modelling for decision support in different scenarios with a special emphasis on telecommunications and clinical environments

Green	Adaptive Software Systems	Developing self-managed software systems that provide high-level abstractions. Systems that can configure themselves on the fly, automatically adapting to the changing problem conditions. Machine Learning and Optimisation to solve real-world problems.
	Mathematical Foundations of Fuzzy Logic	Mathematical logic has been a lifelong interest. For the last 10 years I have been researching fuzzy logic, a practical, applicable form of logic when combined with ICT. Beginning with type-2 FL, I have extended my investigations to include complex FL.
	Grounding symbolic knowledge in robot experience	We would like robots to converse, plan and otherwise interact autonomously with humans and the world. A key challenge in developing autonomous robots is integrating such symbolic reasoning with sub-symbolic learning from robot sensors.
Orange	Energy Considerations in ICTs	Energy consumption of ICT has accounted for at least 2% of the whole world energy consumption. However, a breakthrough for reducing the energy consumption while not sacrificing the performance of the communication systems is yet to be found.
	HPC For the Masses	Computing is moving from single core into multiple core systems. We are now entering a world where (virtually) all systems are parallel. However, making the best use of this is not easy with only a few niche areas having been able to exploit parallelism.
Yellow	Cybersecurity	I am particularly interested in the development of statistical approaches to solving research challenges in Network Security and Privacy.
	Natural Language Processing for Cyber Security	I am mainly interested in applying Natural Language Processing techniques, such as authorship attribution and deception detection, to countering cyber security issues, such as social engineering attacks, fraud/exploitation and radicalisation.
	Smart grid cyber security	In smart grid every component at every level of the electric grid is Internet connected. Inadvertently this also increasing attack surface to the critical infrastructure for cyber attacks. A holistic security approach is needed to address the issue.
	Privacy-aware computation in untrusted networks	Privacy-aware computation aims at realizing secure services which can process, provision and persist private and confidential data without compromising end-to-end privacy. It will consequently assist in privacy-aware data analysts on public data.

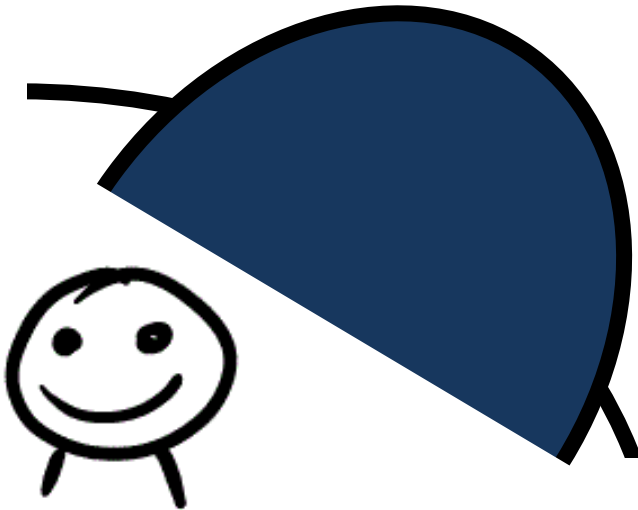
Purple	Participatory sensing	ICT enabled policy modelling and urban governance of Smart cities
	Social, Local Interaction	Mobile interaction has lead to an increase of geo-tagged social media. In the context of Smart Cities, how can we best reintegrate media back into the location of its creation, in a way that informs both visitors and tourists about a place.
	ICT for civic engagement	Exploring how ICTs can be used in engaging members of the public in political discourse and with the running of their own communities. For example, this might include the use of technologies that lower barriers to participation and involve excluded groups
	Video Games to Improve Quality of Life	I am interested in the design and application of interactive technologies such as video games to improve the quality of life of persons with special needs, e.g., older adults in long-term care or persons with disabilities.
	Use of ICT to improve human health	ICT technologies are changing our society at an incredibly high pace. The ageing population poses huge challenges on our current living standards. ICT is a key element to ensure a high quality of life for ageing individuals and their social integration.
	Technology for non-intrusive behavioral monitoring	Recent research shows the importance of behavioural monitoring particularly for ageing population. What are the suitable ICT for non-intrusive behavioural monitoring and discriminating the abnormal behaviours?
	Human operator modelling	Investigating the role of feedback loops in interactive systems, using a control-theoretic approach to modelling the interaction between the human and the device.
	Human-Computer Interaction/Interactive Design	Human-Computer Interaction, cognitive ergonomics and development of quantitative and qualitative research methodologies for examination of interaction with innovative technologies in complex systems.
	Computer vision, graphics, and HCI	My research focus on interactive graphics and human computer interaction, especially on intuitive exploration of data. My long term goals is to apply Internet-scale data processing to computer graphics and human computer interaction.
	human-centric systems for critical environments	Human expertise, know-how and specialised cognitive skills are attributes that are very highly valued in critical environments (e.g. in manufacturing, healthcare). Via new advanced ICT technologies such traits can be an integral part of complex systems.

Ice Breaking

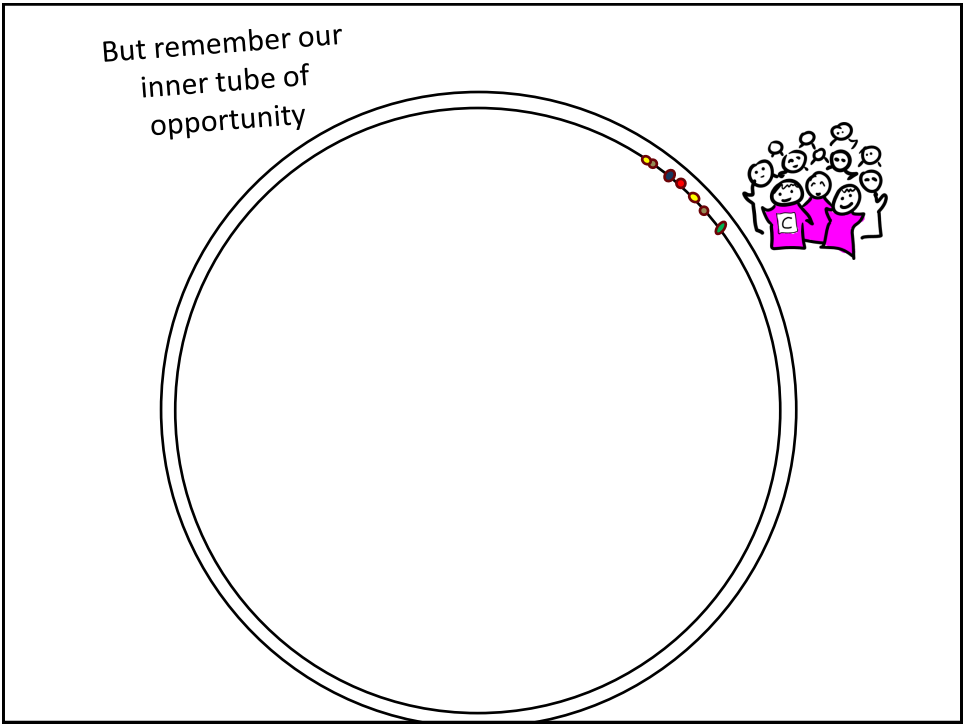
5 Feb 2014 Mike Chantler, Stefano Padilla, Tom Methven

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world



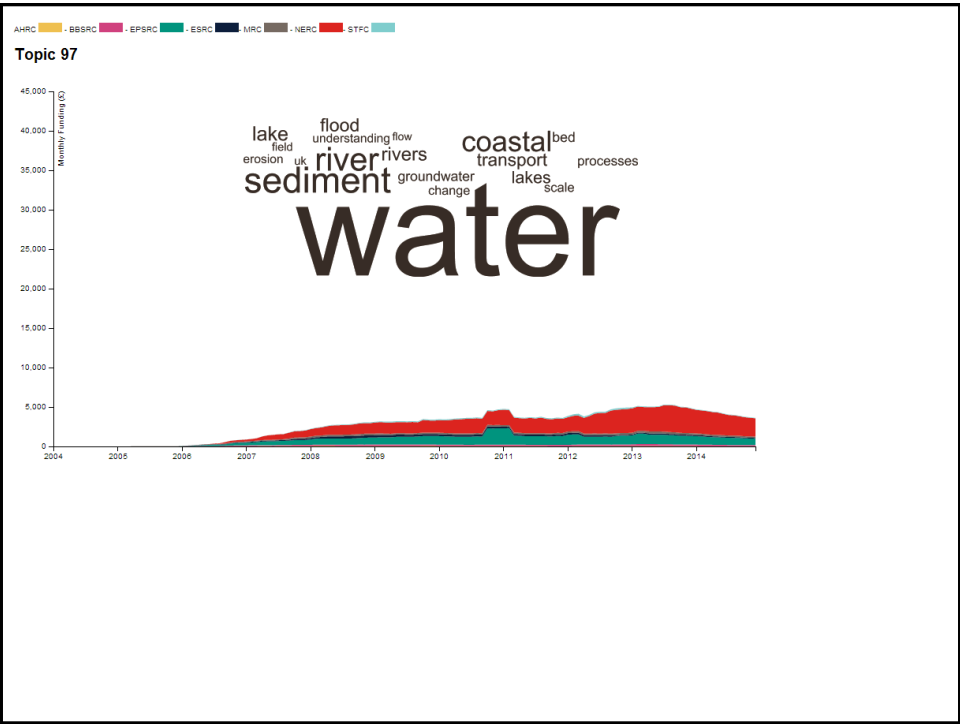
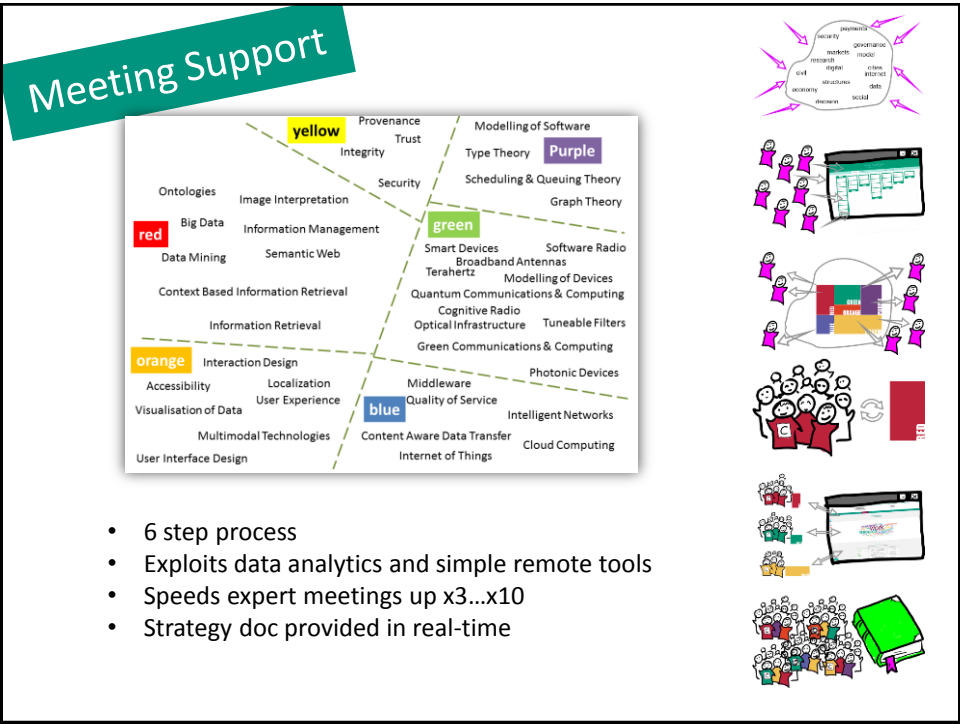
texturelab
vision science • signal processing •
psychophysics • computer graphics



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Topics

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Topic ID	Keywords	Relevance
246	synthesis molecule reaction compound chemical	22.41
23	university dia nottingham dpa queen	18.78
68	theory mathematics mathematical problem geometry	18.16
319	industrial case account university sheffield	17.84
368	training student phd doctoral etc	17.40
303	quantum information classical system mechanic	16.99
474	policy economic environmental impact uk	16.22
537	model modelling prediction experimental computational	15.43
255	centre research university provide international	13.50
523	quantum atom system matter gas	13.26
468	energy demand carbon system technology	13.19
390	network community activity workshop research	12.86
272	energy fuel fossil production source	12.93
287	disease clinical patient treatment diagnosis	12.50
281	research uk industry industrial programme	12.43
350	catalyst reaction catalytic catalysis metal	12.34
527	uk research area leading international	11.81
570	material superconductor electronic superconductivity temperature	11.42
338	protein biological molecule structure function	11.41
301	laser pulse light optical wavelength	11.38

246 - synthesis molecule reaction compound chemical

efficient chemist reagent proposal starting product synthesis molecule compound chemistry organic pharmaceutical methodology chemical reaction material

468 - energy demand carbon system technology

uk supply development policy demand technology electricity carbon system energy government lower renewable emission reduction target future

287 - disease clinical patient treatment diagnosis

medical diagnosis outcome disease early risk healthcare treatment health therapy patient diagnostic population invasive clinical condition major potential platform human

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Topics

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Research Themes:
Information and Communication Technologies

Research Areas:
Human-Computer Interaction

Topic Browser Tool

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Topic ID	Keywords	Relevance
107	digital economy technology society information	3.66
273	user design technology interactive research	3.67
17	research public community engagement practice	3.32
106	organisation trust information policy domain	2.87
209	social people life online individual	2.46
185	people older social health care	2.37
227	people work life technology communication	2.24
380	network community activity workshop research	1.97
144	rural community enterprise scale project	1.97
420	art interactive project internet story	1.75
56	identity stream social individual privacy	1.48
426	feedback technology smart user sensor	1.43
113	ict community citizen perspective issue	1.40
44	creative creativity software artefact cultural	1.30
430	mobile phone user place personal	1.18
224	computing ubiquitous involved challenge embedded	1.17
268	datum information analysis large set	1.16
43	home reminder user project experience	1.05
28	energy building home reduce housing	1.04
474	policy economic environmental impact uk	1.03

107 - digital economy technology society information

organisation information economy individual opportunity hub society technology explore potential create business digital sector economic

185 - people older social health care

service age population people living home family older work designed social life health dementia staff ageing improve care group

268 - datum information analysis large set

dataset data arise database analysis mining vari collection analytic multiple challenge large information algorithm proposal source amount set

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