



# EPSRC ICT Early Career Workshops

Liam Blackwell, ICT Theme Lead

Sheffield and Cardiff  
February and March 2017



# Presentation Outline

- ■ ■ Introduction to EPSRC
- ■ ■ Why are we running this event?
- ■ ■ ICT strategy and priorities
- ■ ■ Industrial Strategy
- ■ ■ Balancing Capability



# Presentation Outline

- ■ ■ **Introduction to EPSRC**
- ■ ■ Why are we running this event?
- ■ ■ ICT strategy and priorities
- ■ ■ Industrial Strategy
- ■ ■ Balancing Capability



- ■ ■ EPSRC is the main UK government agency for funding **research and training in engineering and the physical sciences**, investing more than £850 million a year.
- ■ ■ With a mission to promote and support, by any means, high quality **basic, strategic and applied** research and related postgraduate **training** in engineering and the physical sciences.
- ■ ■ Aim to **advance** knowledge and technology, and provide **trained** scientists and engineers, which meet the needs of users and beneficiaries, to the **benefit of the UK**.

## One Vision

For the UK to be  
the best place in  
the world to  
research, discover  
and innovate

## Two Goals

Research and  
Discover

Research and  
Innovate

## Three Strategies

Balancing  
Capability

Building  
Leadership

Accelerating  
Impact



# Investing in research for discovery and innovation

- ■ ■ EPSRC is at the heart of **discovery** and **innovation**.
- ■ ■ We invest in **long-term, fundamental** engineering and physical sciences research and **training** in the UK.
- ■ ■ Committed to **excellence** and **impact**, we support the talented scientists, engineers and postgraduate research students who through their research, discover new knowledge, explore new ways of thinking and drive innovation.
- ■ ■ Our research ranges from physics, chemistry and mathematics to materials, computing and engineering.
- ■ ■ Our research provides **underpinning** knowledge that informs other fields such as the life and medical sciences.
- ■ ■ Our research places the UK as a **leading** global research nation. It saves lives, creates prosperity, protects the environment and inspires future generations.



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# Why are we running this event?

## Aims

- ■ ■ To provide support and opportunities for Early Career Researchers (ECRs) across EPSRC
- ■ ■ To raise awareness of:
  - ■ ■ EPSRC's strategy
  - ■ ■ funding opportunities
  - ■ ■ the peer review process
- ■ ■ To encourage networking between ECRs from across the UK research community
- ■ ■ To provide an opportunities to interact with experienced colleagues and mentors





# How you can help us with dissemination

- ■ ■ This event was heavily over subscribed (over 250 expressions of interest)
- ■ ■ We would like the outputs of this workshop to be shared with people who could not attend
- ■ ■ One of the questions you were all asked in the expression of interest was: “How will you disseminate information from the event to colleagues at your institution?”
  - ■ ■ Please do these things!
  - ■ ■ Presentations at your institution, blogs, newsletter items, etc
  - ■ ■ We will circulate slides

■ ■ ■ Twitter hashtag:

**#ICTECR**



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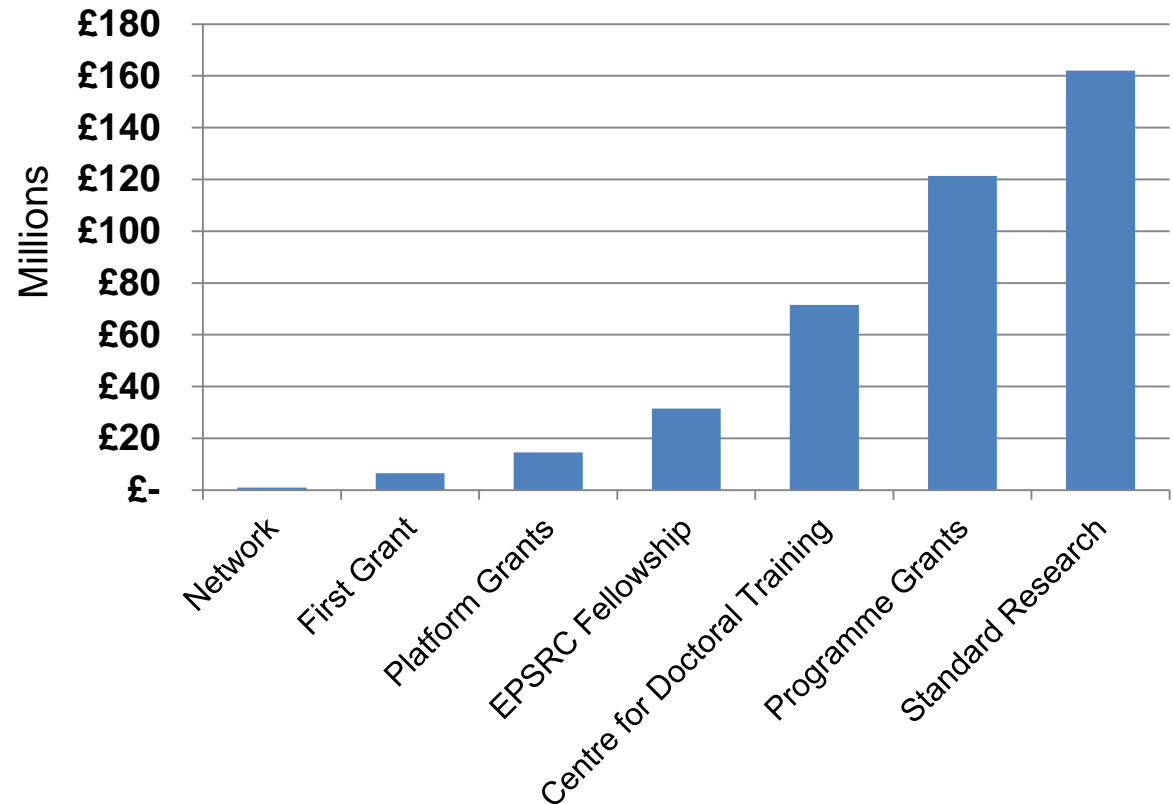
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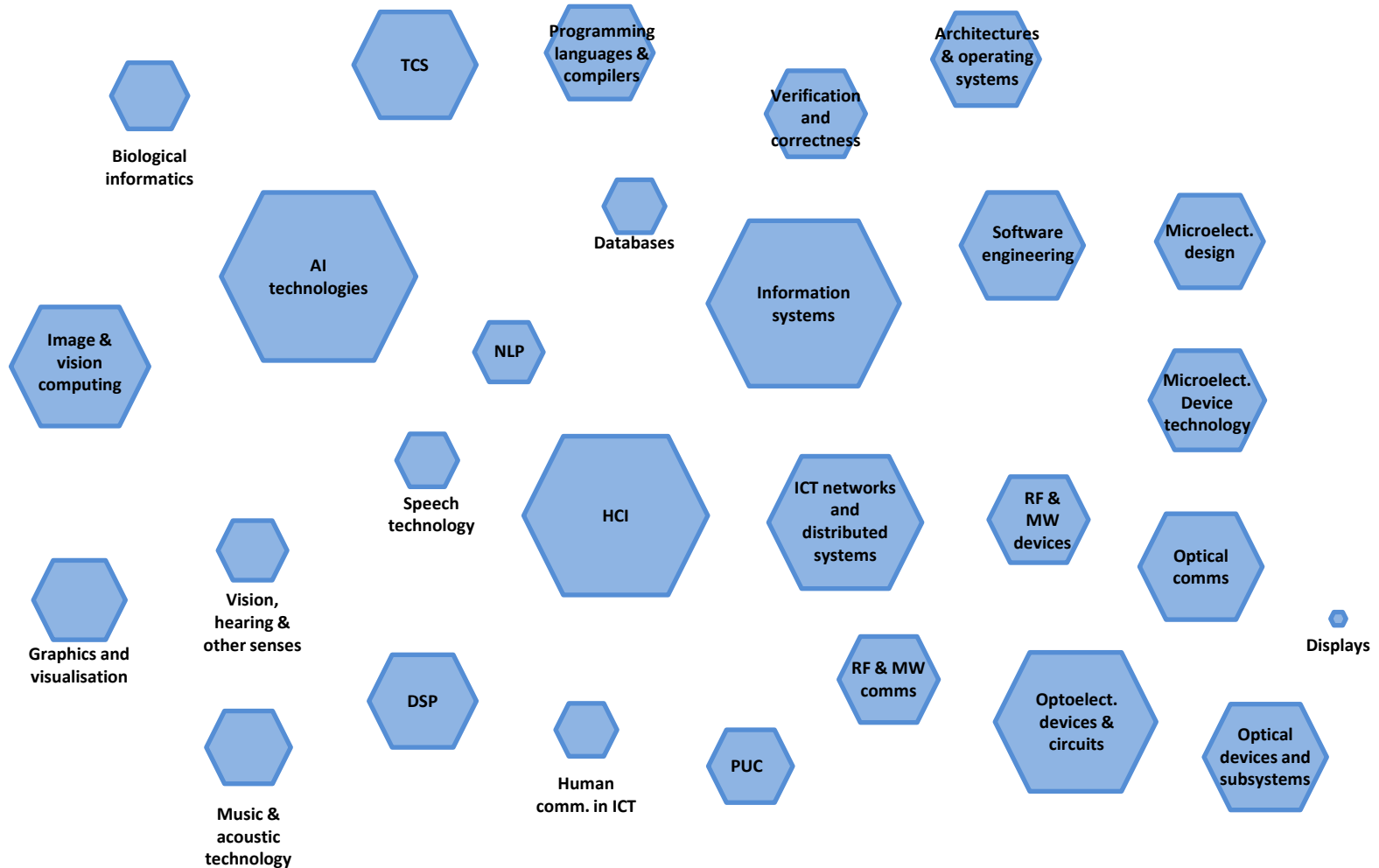
# How ICT Research is Funded

- Research Area model
- Rationale for each area with a strategy based on evidence
- No allocations by research area

Current ICT portfolio:  
Approx. £415M active grants



# Current ICT portfolio



## Some current areas of focus:

■ ■ ■ Equality and Diversity in the ICT research landscape

■ ■ ■ Responsible ICT Research and Innovation

■ ■ ■ Contribution of ICT to the Connected Nation Outcome



## ICT research and research training contributes by:

- ■ ■ Enabling a competitive data driven economy
- ■ ■ Achieving transformational development and use of the internet of things
- ■ ■ Delivering intelligent technologies and systems
- ■ ■ Ensuring safe and trusted cyber society
- ■ ■ Designing for an inclusive, innovative and confident digital society



## We have developed a set of new cross-ICT priorities:

- ■ ■ Data Enabled Decision Making
  - ■ ■ Future Intelligent Technologies
  - ■ ■ Safe and Secure ICT
  - ■ ■ Cross-Disciplinarity and Co-Creation
  - ■ ■ People at the Heart of ICT
  - ■ ■ New and Emerging Areas
- ■ ■ The cross-ICT priorities were published along with the Research Area strategies on 15 February 2017



- ■ ■ New methods for making decisions in a data-rich world
- ■ ■ Will require an integrated approach in which every element reflects the ultimate need for the outputs of that process to in some way benefit a person making a decision.
- ■ ■ This will include, but not be limited to:
  - ■ ■ data wrangling,
  - ■ ■ data analytics,
  - ■ ■ interaction with data,
  - ■ ■ data visualisation
- ■ ■ The data in question will often be complex, incomplete and/or mixed mode.
- ■ ■ There could also be opportunities for work on hardware and computer architectures for enabling faster, more efficient or even real-time decision making.





- ■ ■ Promote development of intelligent, adaptive or autonomous systems that can learn, adapt and make decisions without the need for human control.
- ■ ■ Will inform and contribute to a new level of smartness, e.g. systems exhibiting social intelligence, understand context and adapt accordingly.
- ■ ■ High-ambition priority
- ■ ■ Move towards computing-with-meaning
- ■ ■ Computational systems able to match or even exceeds, levels of human performance in interpreting and making sense of information



- ■ ■ Modern life relies increasingly on its digital dimension.
- ■ ■ We are highly dependent on connected information systems and our dependence exposes us to risks.
- ■ ■ Promote work which reduces the risks associated with ICT technology
- ■ ■ Reliability, robustness and maintainability
  - ■ ■ in the face of accidents, malice or unpredictable events.
- ■ ■ Technical, socio-technical and human-centric approaches will be required.



- 'Cross-disciplinarity and co-creation' encourages collaboration
  - between disciplines and sub-disciplines
  - with users of research.
- Focus on the benefits of cooperation and partnership throughout research process
- ICT landscape has rich opportunities for closer working between disciplines
- Many of the most exciting opportunities emerge at the interfaces between established areas.
- Co-creation approaches will help ensure that the problems being tackled and the opportunities being explored within the EPSRC ICT portfolio are well-framed and clearly understood.



- People engage with and are impacted by ICT as commissioners, users and often without even knowing it.
- Encourages the development of better ICT by asking researchers to acknowledge the relationship that people have with ICT and ICT-enabled systems
- Consider the impact these technologies can have on people.
- Consider these relationships and impacts throughout the research process from planning to implementation.
- Move beyond abstract notions of 'the user' and instead develop a more detailed and realistic understanding of the stakeholders in their research and what solutions which address people's needs look like.



- ■ ■ Encourage truly transformative concepts and technologies within and beyond currently recognisable ICT space
- ■ ■ Needs to comprise something more than an advance, however significant, within an established field.
- ■ ■ It must be genuinely disruptive, offering real potential to significantly alter current practise in research or industry.
- ■ ■ Ideas in ICT might arise in two ways:
  - ■ ■ grown within the ICT research landscape
  - ■ ■ introduced into ICT from other themes / disciplines



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- Announced by Chancellor in his Autumn Statement on 23 November 2016
- Extra **£2 billion** a year for research and development by 2020
- The Industrial Strategy includes
  - **Industrial Strategy Challenge Fund**
    - a new cross-disciplinary fund to support collaborations between business and the UK's science base
    - will set identifiable challenges for UK researchers to tackle
    - Will be managed by Innovate UK and the Research Councils
  - **Innovation, applied science and research**
    - Additional funding will be allocated to research capacity and business innovation to further support the UK's world-leading research based and to unlock its full potential
    - UKRI, once established, will award funding on the basis of national excellence



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## What is Balancing?

- ■ ■ **Refreshing** of all 111 research areas across EPSRC; the building blocks of our research portfolio
- ■ ■ **Updated strategic focus** for each area, helping us to deliver a more healthy, resilient, connected and productive nature through research
- ■ ■ Significant milestone in EPSRC's delivery plan representing 18 months of **evidence** gathering, **consultation** and alignment with our **strategic priorities**



## Why do Balancing?

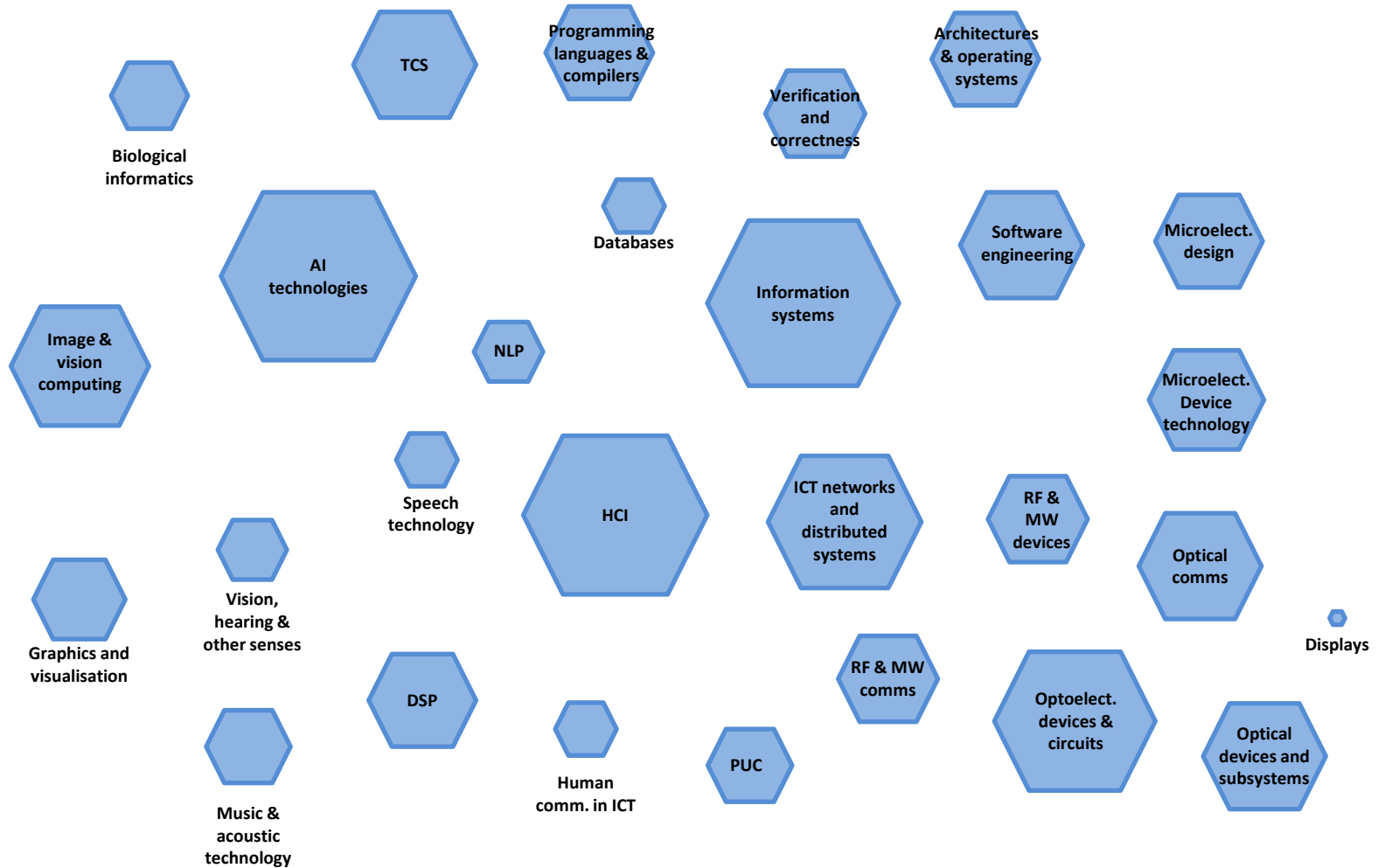
- Recognition that we have a finite budget to work with and, as a result, need to **balance** our investments across our portfolio, taking into account input from the **academic community** but also the needs of the **business users** and national and international **challenges**.
- Ensure our investments are **targeted** in the most appropriate and effective ways
- Creates the space for us to respond to changes from both community-led '**bottom up**' and from strategic '**top down**' research



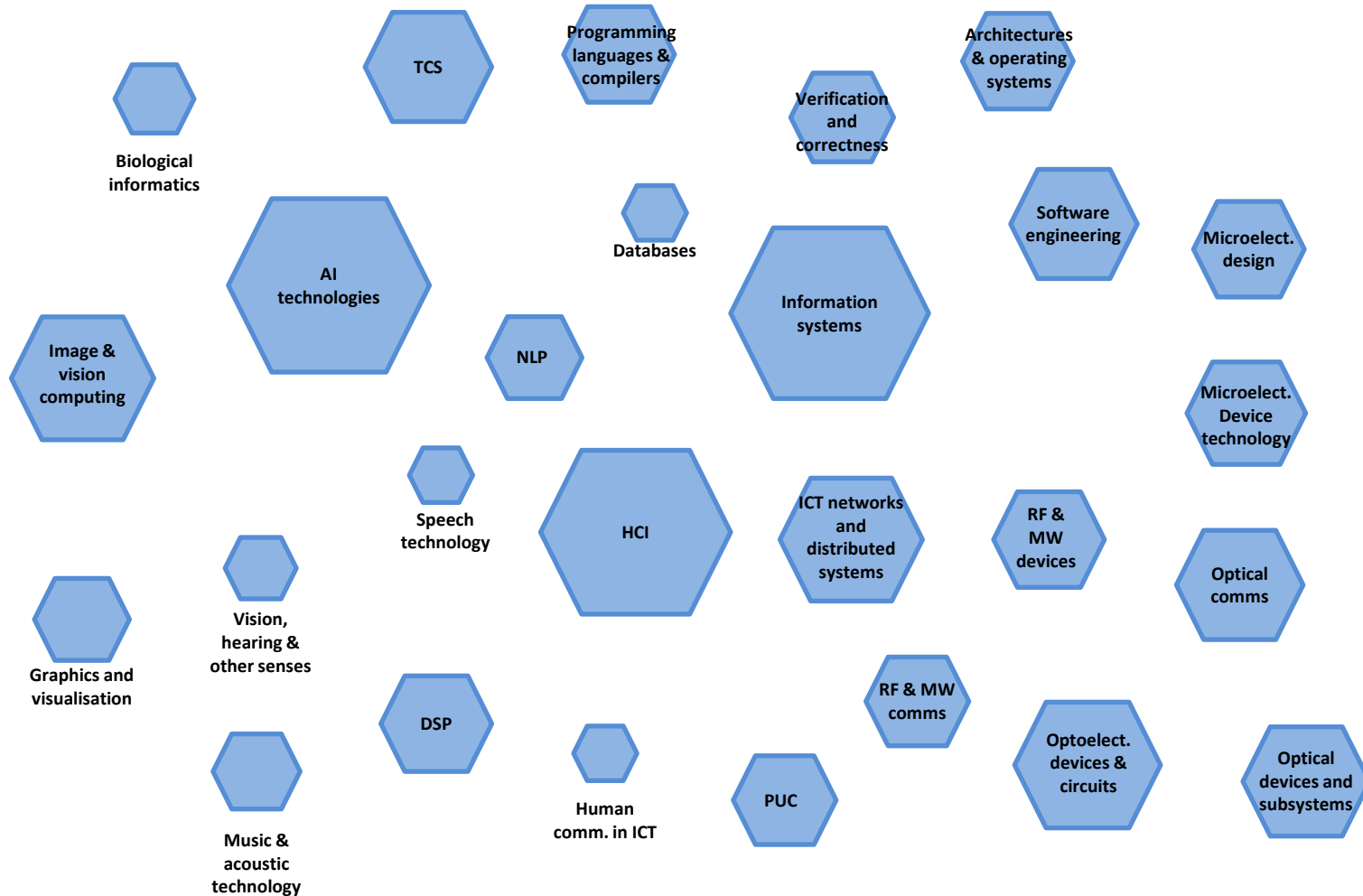
The balancing changes to the ICT portfolio will be as follows:



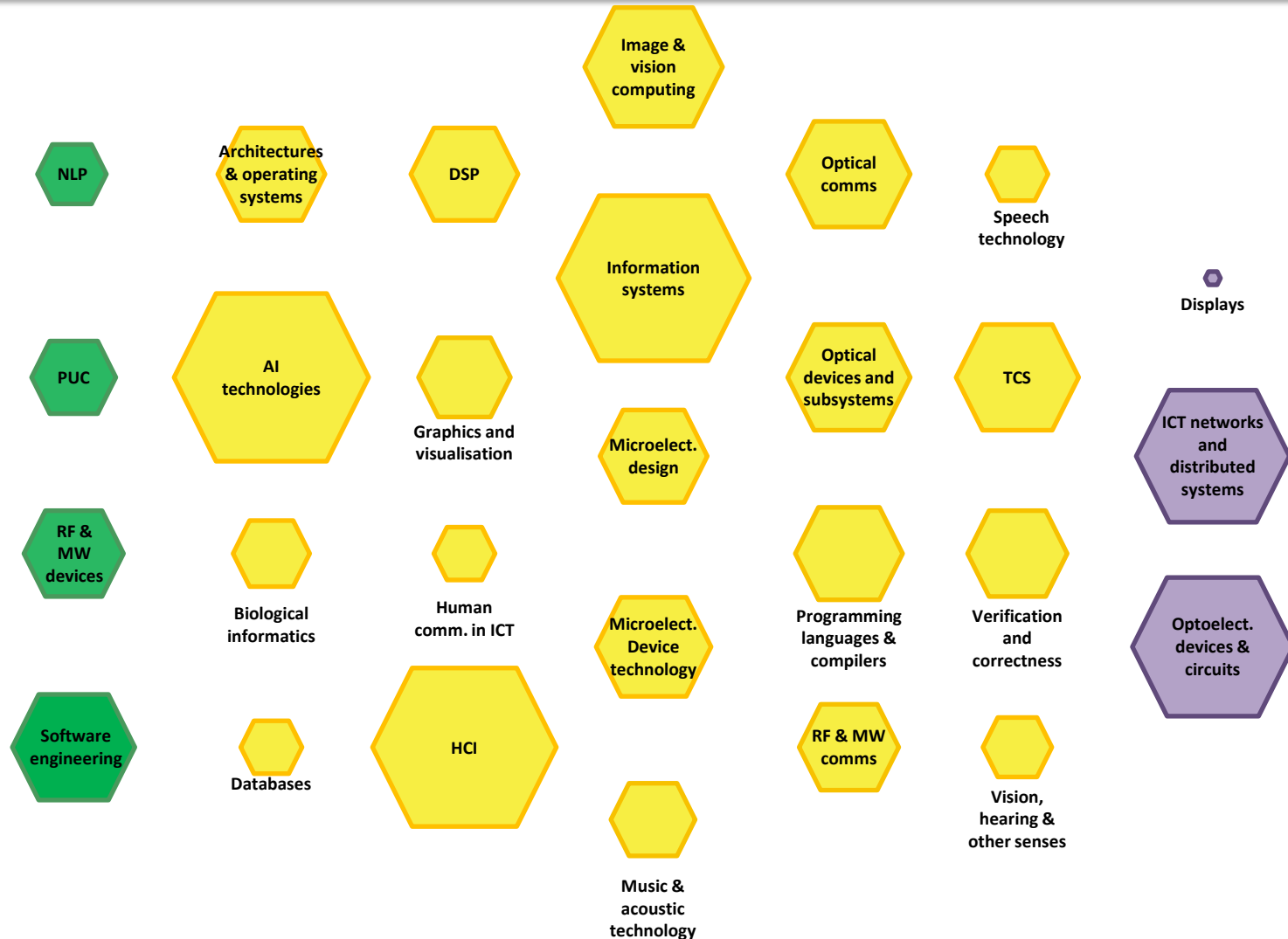
# Current ICT portfolio



# The ICT portfolio we aim to achieve by the end of the next period - approximately



# Planned trajectories for ICT Research Areas



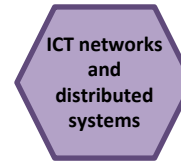
# Planned trajectories for ICT Research Areas – rationales and strategic focus

Key for a data driven economy, the internet of things, intelligent tech, and safe and trusted cyber security



Research into displays is now part of other research areas

Key for the internet of things, intelligent tech, confident digital society, future healthcare, business innovation

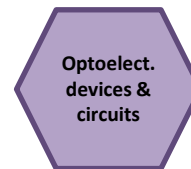


Still want a significant portfolio but a shift towards other research areas, most notably PUC – researchers in this area encouraged to collaborate and link to real world tests

Can contribute to the internet of things, solutions to acute threats, future healthcare, business innovation



Increased emphasis needed for safe and trusted cyber society, intelligent tech, reliable infrastructure and solutions to acute threats



Still want a significant portfolio but can't justify current size at expense of other areas– researchers encouraged to continue to take a systems approach and for there to be a range of projects by scale and scope

Researchers have to submit high quality proposals

Reduce does not mean stop

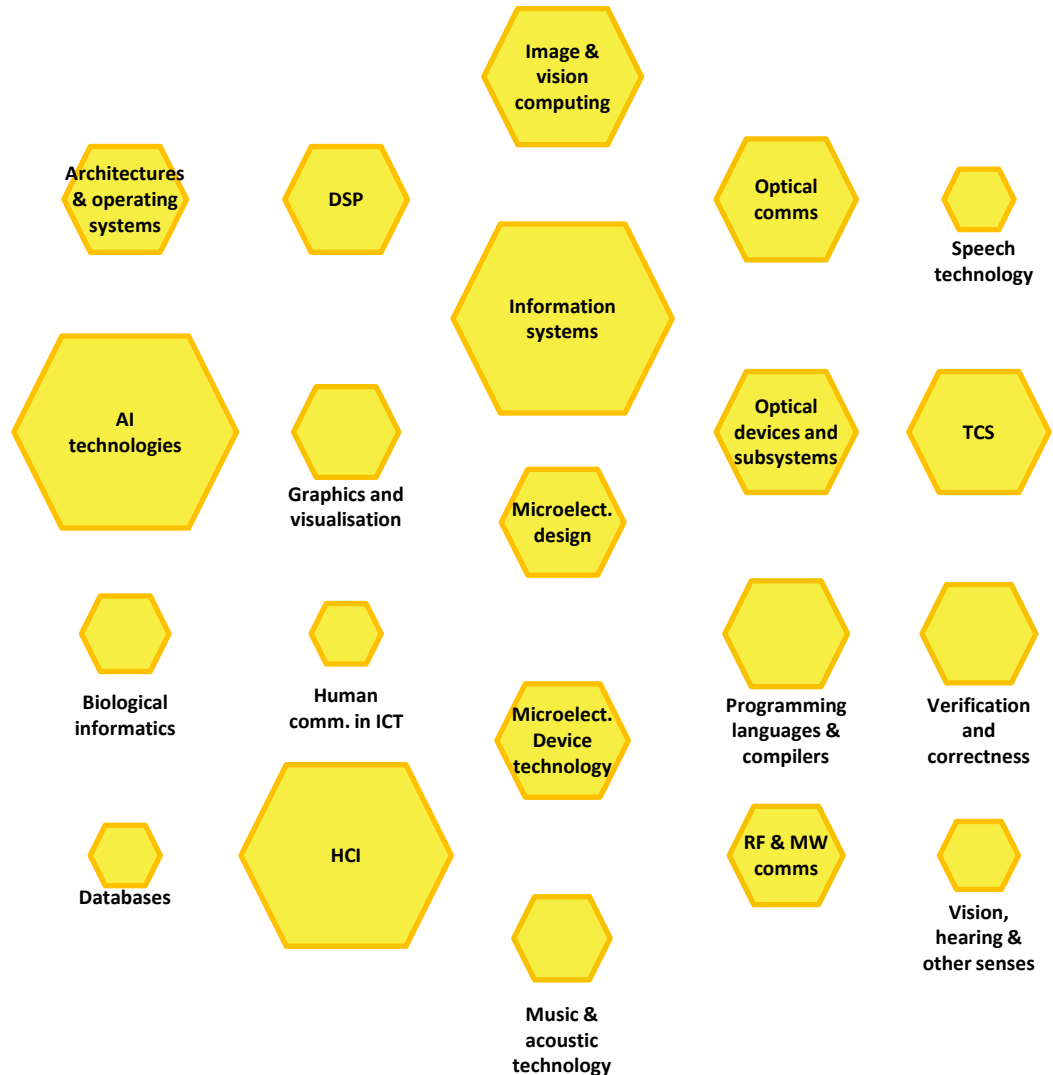


# Planned trajectories for ICT Research Areas – rationales and strategic focus

Key for a range of ambitions under the  
Connected Nation and other Outcomes  
described in EPSRC's Delivery Plan

Strategic foci in for all of these  
Research Areas – researchers should  
consider these

All researchers still have to  
put in competitive  
proposals





## Engagement and evidence collection

- ■ ■ Regional workshops in 2015
- ■ ■ Programme grant holders and fellows meeting 2016
- ■ ■ Network directors meeting 2016
- ■ ■ CDT Directors meeting 2016
- ■ ■ Strategic Advisory Team meetings and input
- ■ ■ Visits to research groups
- ■ ■ Attendance at steering committees for large grants
- ■ ■ Community, industry and other user groups
- ■ ■ Input from industry and other users
- ■ ■ Call for evidence: 692 unique pieces of evidence reviewed across EPSRC



The research area strategies and priorities have a **direct** bearing on:

- ■ ■ Expectations for applications for **standard** grants
- ■ ■ Our **fellowship** priorities
- ■ ■ Expectations for **programme grant** applications
- ■ ■ Any upcoming CDT calls (none announced yet)
- ■ ■ Any other targeted calls
- ■ ■ Where we focus our efforts



# How will these research positions be used?

## Researcher should:

- Read the research area rationales carefully
- Consider the **strategic focus** under each rationale
- Submit research proposals which **contribute** to the strategy of the relevant research area(s)
- Use rationales** as a basis for the arguments for aspects such as national importance

## EPSRC will:

- Use the rationales to guide strategic approach to management of the portfolio
- If appropriate, design calls and other activities to manage the portfolio

## Reviewers will:

- Consider the strategic information in the research area rationales relevant to proposals which they are reviewing
- Consider how well the arguments have been made for aspects such as national importance based on these rationales



- ■ ■ We published the outcomes of this activity on 15 February 2017
- ■ ■ These decisions are consistent with our Outcomes and Ambitions, as described in our Delivery Plan
- ■ ■ For the ICT portfolio there are:
  - ■ ■ Positions on research areas
  - ■ ■ A new set of cross ICT priorities



# The ICT Team

<b>Liam Blackwell</b>	<b>ICT Team Leader</b>
<b>Zoe Brown</b>	<b>Graphics, Image &amp; Vision, Speech, Biological Informatics</b>
<b>Nelly Wung</b>	<b>AI, NLP</b>
<b>Adam Luqmani</b>	<b>Fundamentals of Computing</b>
<b>Sarah Newman (day 2)</b>	<b>Electronics</b>
<b>Laura Cadman</b>	<b>Photonics</b>
<b>Nigel Birch</b>	<b>DSP; Music &amp; Acoustics</b>
<b>Ellie Gilvin</b>	<b>HCI, Impact in the ICT Theme</b>
<b>Michael Barclay</b>	<b>Software engineering, Data science</b>
<b>Mohammad Mehdinejad</b>	<b>Year in Industry Student</b>
<b>Jeanna Gowland</b>	<b>Admin support</b>
<b>Matthew Scott</b>	<b>Communications</b>
<b>Sarah Halliwell</b>	<b>Building Leaders Team</b>
<b>Chloe Turner</b>	<b>Building Leaders Team</b>

# Mentors - Sheffield

<b>Steve McLaughlin</b>	<b>Heriot-Watt University</b>	<i>Writing a grant proposal</i>
<b>Netta Cohen</b>	<b>University of Leeds</b>	<i>Fellowships</i>
<b>Pietro Oliveto</b>	<b>University of Sheffield</b>	<i>Fellowships</i>
<b>Mike Chantler</b>	<b>Heriot-Watt University</b>	<i>Career Development</i>
<b>Alan Winfield</b>	<b>University of the West of England</b>	<i>Impact and Public Engagement</i>
<b>Susan Stepney</b>	<b>University of York</b>	<i>Cross-Disciplinarity and Co-Creation</i>
<b>Caroline Jay</b>	<b>University of Manchester</b>	<i>People at the Heart of ICT</i>



# Mentors- Cardiff

<b>Mike Fraser</b>	<b>University of Bristol</b>	<i>Writing a grant proposal</i>
<b>Laurence Tratt</b>	<b>King's College London</b>	<i>Fellowships</i>
<b>Mehrnoosh Sadrzadeh</b>	<b>Queen Mary University of London</b>	<i>Fellowships</i>
<b>Ann Blandford</b>	<b>University College London</b>	<i>Career Development</i>
<b>David Howard</b>	<b>Royal Holloway University of London</b>	<i>Impact and Public Engagement</i>
<b>Tony Kenyon</b>	<b>University College London</b>	<i>Cross-Disciplinarity and Co-Creation</i>
<b>Lizzie Coles-Kemp</b>	<b>Royal Holloway University of London</b>	<i>People at the Heart of ICT</i>



# Thank You

