

HORIZON: Trusted Data-Driven Products

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Horizon Research Team

Interdisciplinary - computing, engineering, law, psychology, social sciences, business and the humanities

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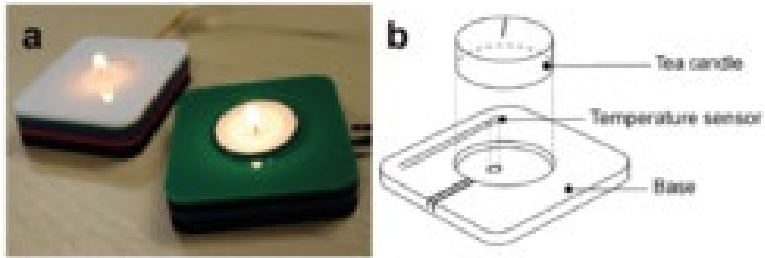
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Horizon Vision

- Established in 2009 - focus was initially on the **collection** and **understanding** of personal data
- Growing awareness of the **economic importance of data** and its link to future products
- But also a growing **crisis of trust** in data handling
- Next generation of data driven products
 - Blend physical and digital elements to become more **personalised** and **adaptive**
 - **Co-created with users** to ensure they are **trusted** by consumers and can benefit society and industry
 - Products ranging from services, to experiential products such as visits augmented with media, to traditional tangible goods



Research Challenges



The **hybrid** products challenge - to establish technologies and concepts to integrate the physical and digital into new forms of product



The **trusted** products challenge – to develop techniques to integrate principles of responsible innovation into the design of products that harness personal data



The **social** products challenge - to ensure products are designed both for and by groups, so they successfully operate within complex social settings

Approach

- Co-creation of interdisciplinary projects with external partners
 - Projects emerge from **user driven theme days**
 - All projects to have at least two disciplines and at least one external partner
- Thematic, cross-sectorial approach to **deliver impact**
 - Co-production campaign
 - Consumer products
 - Welfare
- Agile translational research projects
- Cross-cutting reflective research projects

Co-production Campaign

- Focus on creative and cultural industries including broadcasting
- Consumers co-create media
 - from directly producing content (e.g., broadcasting local festivals)
 - to indirectly shaping products through personal data (e.g., physiological interfaces to interact with films)



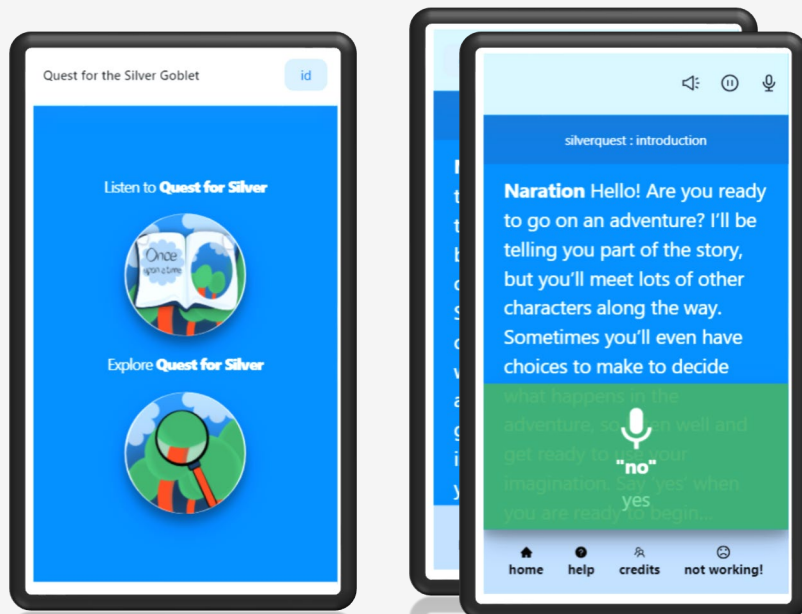
Future Festivals

- Explored how we can enrich the performer and audience social experience of blended festivals
- Partners: Streampark, Oxfam, Live Cinema
- Delivery and study of festivals with Facebook's watch party system and Streampark platform
- Bubbles platform – new unique multi-user 3D environment with live feeds
- Delivery of Voxjam and UPBEAT festivals, the UoN Diversity Festival, and holocaust education programme with National Holocaust Centre and Museum



Storytelling: Grow your own adventure

- Developed and evaluated a digital storytelling voice assistant for storytellers, parents and their children to engage in active storytelling
- Partners: Makers of Imaginary Words, Nottingham Playhouse
- In-school development workshops (year 5)
- Prototype: <https://horizon-institute.github.io/qfs/>



Adaptive Interactive Movies

- Investigated the ethical challenges and cultural opportunities of Affective Media
- Using a computer vision system to detect an audience's real-time reactions to cinematic content and use that to steer the narrative
- Partners: AlbinoMosquito, Kino Industries, BlueSkeye
- Open-source mark-up tool
- Adaptive film: Before We Disappear
- Screened at Broadway Cinema and Nottingham Contemporary, to be released on STEAM



Consumer Products Campaign

- Focusing on new kinds of data-driven products, production processes and enabling technologies that combine the physical and digital aspects of products
 - to create new value propositions for consumers
 - exploring innovative interaction techniques and technologies such as AR and robotics



Failsafe

- Robotics technologies are challenged by frequent failures, especially for long-term autonomy
- This project is exploring risks and accountabilities with stakeholders
 - to broaden understanding of potential failures for human-robot interaction
 - and address stakeholders needs and concerns
- Partner: Beko
- Outputs: Expert and Public ideation workshops, “In-the-Wild Failures in a Long-Term HRI Deployment” at IEEE International Conference on Robotics and Automation (ICRA) 2023



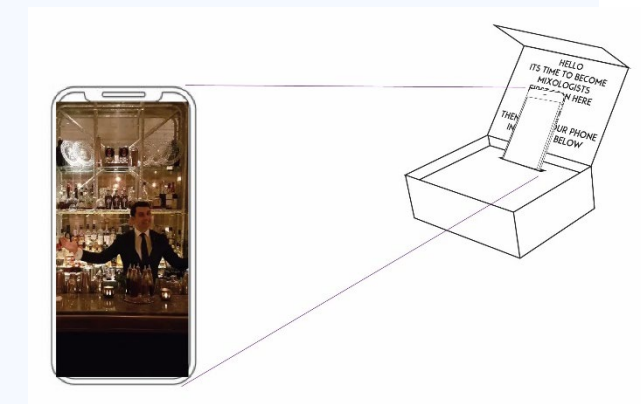
Expressive Personalisation of Consumer Products through Dance

- Explores how people can use their expressive skills to interact with generative algorithms to personalise products
- Workshops with professional disabled dancers to create an inspiring portfolio of prototype products
- Partners: Candoco Dance Company, Remap, KTH



The Recurrent Value of Digitally Augmented FMCGs

- Investigates how novel digital technologies can responsibly improve the value of FMCGs
- Partners: Secret Drinks Club
- Augmented snack bowl - study investigates the concept of providing feedback and pacing snacking in collocated gaming contexts
- AR augmented drinks box – rituals of cocktail making as a social and recurrent experience



Welfare Campaign

- Will explore personalised health, well-being and a consumer welfare agenda. We will focus on:
- Wellbeing on the Internet, relating to both to the Internet as a technology to boost wellbeing, and the Internet as technology which directly affects peoples' wellbeing
- Digital Mental Health, encompassing novel data-driven technologies for digital mental health (DMH) with RRI at its heart

Cross-cutting: Responsible Research and Innovation

- Understanding the main factors that impact RRI integration
- Development and validation of physical and online tools to aid RRI practice

Responsible Innovation Prompts and Practice Cards (RI Cards)



Distributed over 200 physical decks so far in the UK, USA, France and Australia, collating feedback

- Supporting RRI training and practice

Cardographer Web app



Partner: Observatory for Responsible Research and Innovation in ICT (ORBIT)

Agile projects: Personalisation and safety online



- **Minimal Intervention Distributed Account System (MIDAS)** - Investigating the scenario of 'sharing' online accounts in a safe, secure and efficient way, Partner: BBC



- **Adaptive podcasts** - Exploring privacy and trust challenges involved in the adoption of adaptive podcasts, Partner: BBC



- **Everything in Moderation** - Examining challenges for moderation of online content across public or private communication, Partner: Internet Society

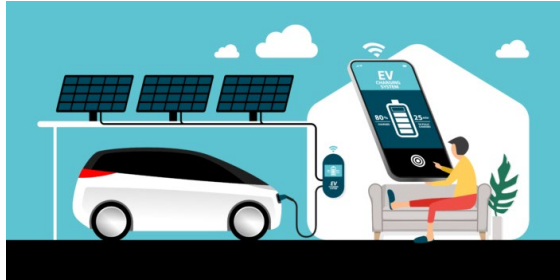


- **EFRESH** - creating guidance to support effective, safe and responsible research on online communities, Partner: Internet Society

Submission of research evidence to:

- DCMS consultation 'Data: a new direction'
- UK Parliament 'The future of Public Service Broadcasting (PSB)' inquiry
- DCMS consultation 'Audience protection standards on Video-on-Demand Services'
- UK Parliament 'The right to privacy: Digital Data' inquiry
- Call for evidence from the Joint Committee on the Draft Online Safety Bill
- DCMS consultation 'Connected tech: smart or sinister?'

Agile projects: Living Sustainably

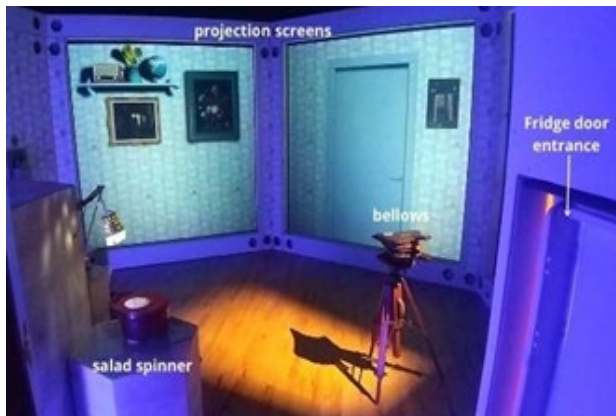
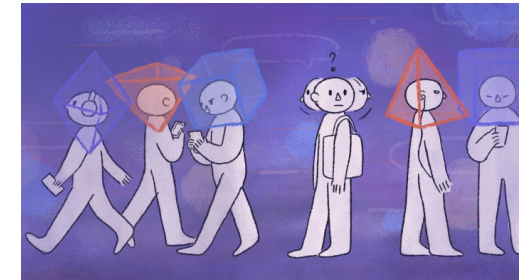


Domesticating Electric Vehicle Charging

- Exploring roles and implications of autonomy and smart technologies in residential electric vehicle charging, Partners: Ofgem and the Department for Business, Energy and Industrial Strategy

Effects of media polarization in dissemination of net zero policies

- Understanding the effect of collaborative filtering in recommender systems on how policy information propagates, Partner:



Home:Zero

- Investigating the role of a MR art installation to stimulate family conversations about reducing home emissions
- Co-designed with families
- Partner: 'Makers of Imaginary Worlds', initially funded by NESTA and the National Gallery
- National Gallery's experimental space NGX, Lakeside Arts Centre, Strelley Library in Nottingham and Mansfield Museum

Track Record



Over 40,000 people have engaged with us in over **271** activities



187 publications featuring in journals and conferences



42 new collaborations and partnerships established



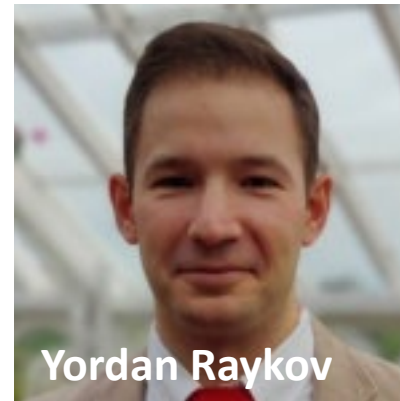
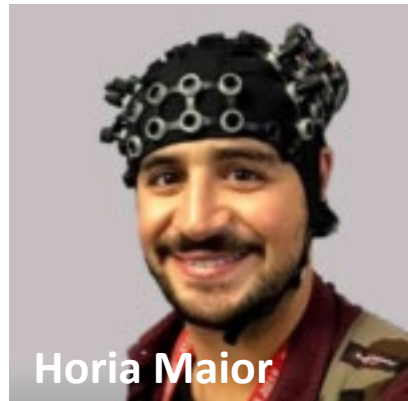
12 new artistic and creative products released



8 new open-source software and technical products developed

Capacity Building and Community Engagement

- **Transitional Assistant Professors** - enabled us to recruit highly talented research fellows into the academic career track



- **Co-bot maker space**

