Brain Health Technology & Data Challenge

Wednesday 02 November 2022, 1000-1230













Attendees please note

- 1. We are recording this event and it will be hosted on our HAIC webpage resources so it can be watched on demand
- 2. If you do not wish to appear on the recording, you should move to the back of the room so you are not on camera











Today's event

Joanne Boyle

Digital Health & Care Innovation Centre

Agenda

- 0930 Registration & networking
- 1000 Welcome and introductions Joanne Boyle, Head of Engagement, DHI
- 1020 White paper/ special interest group work Dr Mario A Parra, Senior Lecturer in Psychology University of Strathclyde
- 1050 Refreshment break
- 1100 Funding criteria, rules and project timings Darran Gardner, Business Development Executive, The Data Lab
- 1115 Future funding and support options Darran Gardner, Business Development Executive, The Data Lab
- 1130 Q&A
- 1200 Final comments
- 1205 Networking
- 1230 Event close











Welcome and introductions

Joanne Boyle

Digital Health & Care Innovation Centre

White paper/ special interest group work

Dr Mario A Parra

University of Strathclyde







Technologies for Brain Health and Dementia Prevention Ongoing Initiatives

Dr Mario A Parra University of Strathclyde

Brain Health Technology & Data Challenge part of

DATAFEST2022

in partnership with











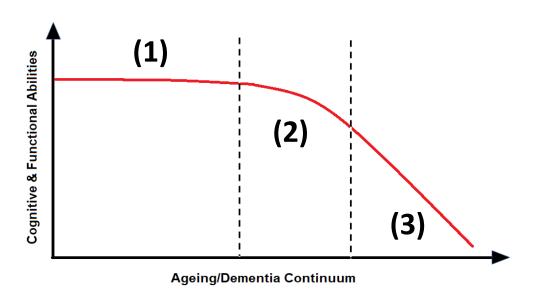






Needs

- (1) Technologies that can promote brain health (e.g., by encouraging sustainable behavioral changes towards protective factors)
- (2) Technologies that can help restore cognitive and functional abilities (e.g., by tapping into spared abilities to maintain cognitive and functional levels)
- (3) Technologies that can assist those who cannot longer live independently (e.g., replacing lost cognitive and functional abilities)









Challenges

- Lack of theory: Healthcare technologies, particularly those aiming at supporting brain health and prevent dementia, need to incorporate state of the art knowledge from relevant disciplines.
- **Limited ecological validity:** Available technologies, particularly those aimed at promoting and restoring brain health, do not allow transfer of restored skills and abilities to real-life experiences.
- Rigid intervention platforms and non-adaptive systems: most available technologies focus on a one-size-fits-all solution, unsuitable for personalised interventions.
- **Limited access:** Factors such as socioeconomic status, technological literacy, and the remaining digital divide are limiting the scope and impact of healthcare technologies.
- Ethical issues: This is perhaps one of the most contentious area of healthcare technologies.







Technologies for Brain Health and Dementia Prevention Workshop

The Scottish Dementia Research Consortium (SDRC) and the Digital Health & Care Innovation Centre (DHI) hosted a two-day event that encapsulated keynote speakers and interactive workshop sessions, which focused on technologies for brain health and dementia prevention.



Aims

- 1) To provide a space for interaction wherein the relevant community could come together to explore synergies among ongoing initiatives.
- 2) To explore opportunities to set up Special Interest Groups (SIG) which can work collaboratively with the SDRC.
- 3) To co-produce a white paper that will pave the way towards future technologies for brain health and dementia prevention in Scotland.







Theme 1: Adaptive technologies, precision medicine and interventions. This theme focuses on technologies that hold to potential to adapt to the changing needs of those affected by neuro-progressive diseases. These are essential for person-centred assessments and interventions.

Theme 2: Technologies to enhance brain health. The advent of VR/AR, Wearables/Sensors, Cognitive Prosthetics, Reminiscence Technologies, and other technologies is creating unprecedented opportunities to move assessments and interventions from the lab to the real world.

Theme 3: Assistive technologies. There is a growing interest in technologies that can support people with disabilities to live safely and independently whether at home or in care facilities. We are witnessing a rapid growth of Ambient Assisted Living, Smart Environments, Living Labs, Tele-presence and Tele-care, Cognitive Robotics, just to mention some key examples.

Theme 4: Co-design and co-production for brain health technologies. The Scottish Brain Health and Dementia Research Strategy aims to encourage a paradigm shift whereby researchers and members of the public come together to become co-designers, co-producers and co-beneficiaries of research.







Technologies for Brain Health and Dementia Prevention Workshop

Exercise 1: Discovering insights

Exercise 2: Opportunities and Impediments

Exercise 3: Mind Mapping Opportunities

Exercise 4: Developing Ideas





Aims



3) To co-produce a white paper that will pave the way towards future technologies for brain health and dementia prevention in Scotland.







Workshop (Synthesis of Results)

Theme 1: Adaptive technologies, precision medicine and interventions.

Exercise 1: Discovering	Exercise 2 : Opportunities	Exercise 3: Mind	Exercise 4:
insights	and Impediments	Mapping Opportunities	Developing Ideas
Effects of socio-economic culture Worldwide and language changes Stay connected socially with technologies Patients – care givers, support environment	 Unlocking ethnic minorities and raise trust (i.e., issue with different backgrounds) Representative of different cultures to be more person-centred Increase access to services by ethnic minorities – life post covid Collaboration breeds more opportunities for collaboration with different backgrounds 	Diverse stakeholder collaboration Interdisciplinary communication Interdisciplinary sandpits Interdisciplinary pizza talk e.g. engineering and social sciences Interdisciplinary media platform/forum Workshops to bring the community together (In person) Trust, convenience and transparency Data linkage Digital proof Involve regulatory bodies (ethics) to enable access to trustworthy data Feedback to participants on data use and outcomes	Idea: Interdisciplinary media platforms/publications Idea: Multilingual Ethnographies Minority groups Charities Government agents Researchers Health practitioners Graphic designers Language specialists NHS interpreters Idea: Feedback participants data use and outcomes Researchers Volunteer panels National registries NHS networks Charities





Exercise 3: Mind

Exercise 2: Opportunities

Increase inequality if not provided for free



Exercise 4:

Ongoing Initiatives

Workshop (Synthesis of Results)

Exercise 1: Discovering

	insights	and Impediments	Mapping Opportunities	Developing Ideas
Theme 2: Technologies to enhance brain health.	Be a diagnostic tool Prompt memories using created environments Controlled environment User friendly, affordability, personalisation Uplift people Technologies can be used to track changes and intervention Technology can let people down a more positive/healthier avenue Technologies can enhance behaviour's Technologies can guide neuromodulation in desired direction Technologies can be used to improve quality of life Technologies can be used to predict neurodegenerative changes before they overtly manifest themself Understand resistance to technologies — develop technologies accordingly	 Flexibility to respond to change Free up clinician time Safe environment Wider health benefits – physical health Potential for confidence, self-worth and independence Could enable social engagement Opportunity for wider economic and social benefits Impediments VR: Motion sickness, disconnect from reality – not precisely the same Technologies can stifle social interaction 	 VR/AR neuromodulation robots – Alexa/google apps People citizens co design clinician Technology – HW, SW, integrate Needs Difficult to use by non expert Support and training infrastructure Useability and design – co-creation 	Idea: Using VR/neuromodulation for retaining brain health Who, with whom, for whom People at risk of neurodegenerative diseases Where and when Biomarkers Mild cognitive impairment What, how and why: VR/neuromodulation Positive interventions (preemptive, preintervention) Potential to transfer from clinic to home Safe controlled, familiar environment







Minimising maintenance burden/requirement - changing

Compatible with existing

Error recovery by alerting

someone who has technical

experience. Anticipating failure

accordance e.g. a watch should

batteries/settings

tell the time

modes.

Ongoing Initiatives Workshop (Synthesis of Results)

Theme 3: Assistive technologies.

Exercise 1: Discovering	Exercise 2: Opportunities	Exercise 3: Mind	Exercise 4:
insights	and Impediments	Mapping Opportunities	Developing Ideas
 Emotional/Physiological/Behavioural/Clin ical monitoring GPS trackers Physical assistance Hoists (motorised), ramps, wheelchairs, stairlifts, robots, Service robots Passive audio monitoring (environmental) Social assistance e.g. robotic pets? Temp/Co2 levels Telecare Fall detection devices Inconvenient, stigmatising, required used, intervention, false positives Privacy ethics 	 Multi-sided benefits (for patient and carer) Removing stigma through messaging and design Introduction of tech shouldn't be forced on people Inobtrusive feedback/notifications (for patient) Integration with other tech/services/health records Control (access to data, what, when, who) could mean better adoption Reduction social isolation (teams zoom) Empathy (listening to people with lived experience) 	Increasing the accuracy and reliability of the system. Indicating uncertainty. Providing options for user feedback on how it's performing Eliminate need for behaviour change (people with advanced neurocognitive diseases can't be expected to learn how to use it) Choice – types of tech, where assistance is recorded	 Redundant sensors Multi-modality Indicate uncertainty User feedback/user interface Understanding impact of false positive/performance Data collection, methodology. (bias/temporal effects/understanding historic patterns in data

Impediments

charged

Complicated

Privacy, ethics, consent

Money, Disturbance, Stress

Required user intervention

Inconvenience, Stigma

Passive, LED/feedback, light pollution

Charging - Especially if not normally







Workshop (Synthesis of Results)

Theme 4: Co-design and
co-production for brain
health technologies.

insights Change resistance – uncertainty of new and different Need diversity to help avoid bias Can't forget the human Can't forget the younger people

Exercise 1: Discovering

- Choice is important allows people to make decisions about how you engage
- Really viewing users as experts this means everyone
- Engaging with those who are resistant to technology will get more innovative results
- Need the bridge between theory and practice – this is real life experience
- Covid has also put up barriers to coproduction e.g. care staff fatigue
- Avoiding tokenistic engagement
- Shifting paradigms without increasing inequalities is difficult but important
- The "pitch" needs to be at everyone's level to get true engagement
- Cost of living crisis this will impact people's use of technology

Opportunities

- Managing expectation
- Building people's confidence (e.g. "I'm not trained in tech – I can't do this")

Exercise 2: Opportunities

and Impediments

- Building technology on people's existing skills
- Communication and relationships
- Personalising technology e.g. personal emails
- Getting into schools to engage with young people
- Equipment people are happy and comfortable with
- Individualise let people talk their talk
- Changing terminology
- Listen to fears angry people are angry for a Pool resources reason

Impediments

- People in care don't want to work with technology, they want to work with people
- Finances, time, not considering young people
- Connectivity in rural areas

Technology supports people – it doesn't replace them

Exercise 3: Mind

Mapping Opportunities

- Hubs real world simulation and opportunity to try using technology/ Drop in type places e.g. G.P surgery
- Relatable campaign e.g. t.v. advert "that person is like me". Have fun. Plant the seed
- Primary care signposting, demonstrating opportunities, videos of real life scenarios
- Animation and jingle/strapline (but actually doing it/accountability)
- Interactive learning and engagement

- National engagement database (tried and tested).
- Central signposting hub with everything from different silos in same place
- Record/database of methods that haven't worked and why (publication bias)

Idea: Coffee and cake technology awareness meet up

Exercise 4:

Developing Ideas

- Social workers
- Carers
- Young people
- Schools, colleges etc

Showing people the different types of technology available – giving the opportunity to try different tech e.g. robots, smart socks, I-pads, dementia circles, whiteboards.

Idea: Real world simulation opportunity to try

- Person-led. Families
- Circles of support
- Architects, Housing, Designers

Showing how it could be done. Give people opportunity to use and give feedback on design. Show and tell type approach

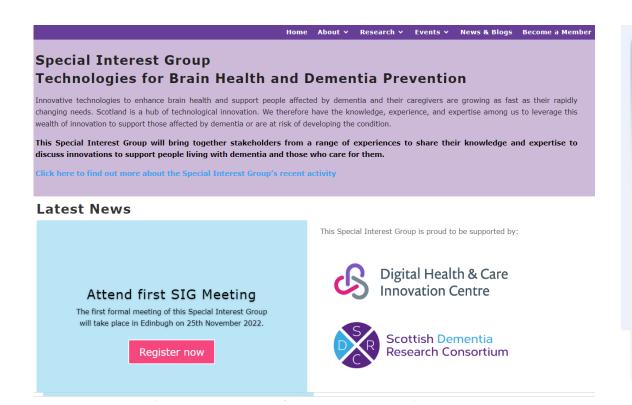




Digital Health & Care Innovation Centre



Next Steps





Join our Special Interest Group

https://www.sdrc.scot/technologies-sig

Register for our Meeting

https://www.eventbrite.co.uk/e/special-interest-group-technologies-for-brain-health-dementia-prevention-tickets-440236879357







Next Step



- 1. Introduction of members
- 2. Workshop Follow up (DHI/GSA/SDRC)
- 3. SIG Leadership
- 4. Agenda 2023
- 5. White Paper (strategies for co-production)

Fri, 25 November 2022, 13:00 – 16:00 GMT Alzheimer Scotland Dementia Resource Centre, Edinburgh







Technologies for Brain Health and Dementia Prevention *Ongoing Initiatives*

Dr Mario A Parra

mario.parra-rodriguez@strath.ac.uk

Thank You

Refreshment break

Funding criteria, rules, project timings, future funding and support options

Darran Gardner

The Data Lab







is Scotland's innovation centre for data and Al

Our mission is to help Scotland maximise value from data and lead the world to a data-powered future

www.thedatalab.com







How The Data Lab Works









We are here to accelerate the journey by **fuelling innovation** through **collaboration**, **building skills** and **growing talent**, and **strengthening** Scotland's **thriving data science community**









The Data Lab ecosystem



Industry innovation



Over 100 projects and £4m of funding linking companies to academic talent

Partners:

- Codeclan
- DDI Skills
- Skills Development Scotland



Skills/ Training The Data

Academics & Researchers



Ecosystem of Scottish academics (computing science and beyond)

Public Sector



Supporting Scottish Government, NHS Scotland and local authorities, including data science mentoring for Scottish Govt data accelerator and CivTech









Data Lab Services



- Collaborative Innovation Projects
- Data science support
- External funding service
- Moonshot fund
- Funding Finder (2022)
- Resources hub
- Case Studies



Skills & Talent

- Leadership training
- Online learning (new LMS 2022)
- Masters Placements (MSc)
- Industrial Doctorates (PhD)
- Data Education for Work
- Schools' resources



- DataFest (new partnership programme 2022)
- International Learning Journeys
- Meetups
- Masterclasses
- Blogs
- Podcasts
- Community Platform











Brain Health Technology & Data Challenge

DATAFEST**2022**

in partnership with

















Collaborative Innovation Projects

A Collaborative Innovation Project is an R&D project which aims to leverage Scottish academic expertise to help a company utilise data science to innovate around a product, service or process which will generate new income and help retain or create jobs

Technology Readiness Level: 3-6

Range from research prove feasibility to technology demonstration









How a project works



- Led by a company with a desire to develop a new data-driven product, service or process, with data science playing a key part in delivering it
- Project outcome should have an economic (turnover, jobs,) or social impact
- Involves a collaboration with a Scottish University academic team bringing in relevant data science/ domain experience
- The Data Lab funds 80% of the academic team's costs up to maximum of £20k
- The Company contributes 25% toward those total academic costs AND makes an appropriate in-kind contribution (e.g. staff time, data costs, hardware investment)
- £20k project standard duration 2/3 months









Issues to consider



- Capability of company to manage project and build on output with further internal investment or external funding support
- Interest/ capacity and capability of academic team to deliver project in collaboration with company
- Management of project with effective communication to ensure delivery of project with impact
- Management of expectations on both sides: academics need direction and company need to understand limitations of academic teams (e.g. they are not software developers or the right people to design/build projects)









Additional points



- Opportunity to build long-term relationship with academic experts in a particular domain
- Useful partner for future consortium / funding bids
- If a company has a project idea but doesn't have an academic partner or isn't sure how to find right partner, then The Data Lab and DHI can help identify potential partners











 Project application provides three options – applicant company selects one which is negotiated with selected academic partner university:

Each Party will own the Foreground IP generated by it, granting the other a non-exclusive royalty free licence to use the Foreground IP for conducting the project. Additionally, the Company / Organisation will be granted a non-exclusive royalty free licence to use the Foreground IP generated by the Academic for any purpose whatsoever. The Academic Institution will be granted a non-exclusive royalty-free licence to use the Foreground IP generated by the Company / Organisation for academic research, teaching and non-commercial collaboration.

The Company / Organisation will own all Foreground IP and will grant the Academic Institution a non-exclusive royalty free licence to use the Foreground IP for (i) conducting the project and (ii) for academic research, teaching and non-commercial collaboration.

The Academic Institution will own all Foreground IP and will grant the Company / Organisation a non-exclusive royalty free licence to use the Foreground IP for (i) conducting the project and (ii) for any purpose whatsoever.

If this box has been marked, please indicate whether the Company / Organisation would like to discuss an exclusive licence to commercialise the Foreground IP. Further details can be provided in the textbox above.









Timings for funding call



- Challenge launch and call for EOIs: Nov 2, 2022
- Deadline for submission of completed EOI form: 5pm Dec 7, 2022
- Confirmation of approval to move to full funding application: Dec 16, 2023
- Deadline for full funding applications: Feb 13, 2023
- Review team decisions communicated to applicants: March 3, 2023
- Project start dates will vary (from April 1, dependent on legals and project team capacity)
- All projects to be completed by Sept 1, 2023









Funding routes



- A single £20k project represents a modest investment in R&D: what's next?
- View project as a stepping stone to a destination (the economic impact of a new product or service) and build a roadmap of potential support you might look at (e.g. SE Smart Award, Innovate UK grant, KTPs, other funding calls, private investment)
- Organisations like The Data Lab (new Funding Finder tool) and DHI can help signpost to potential funding opportunities









Example project (1)



Project involving William Quarrier Epilepsy Centre collaborating with Glasgow Caledonian University:

- Proof of concept looking at the practicality of combining data from monitoring devices with video footage
- The target is to improve diagnosis enabling the facility to treat more patients more effectively
- There is the potential to expand this innovation into other neurological conditions
- WIII require further funding to develop (e.g. KTP, Innovate UK)









Example project (2)



Project involving Lay Summaries and Glasgow Caledonian University:

- Focus on using of Natural Language Processing (NLP) to help the company develop a soltuion that will automate the creation of non-technical summaries of clinical trials for public consumption
- Drive for tool linked to change in legislation
- Collaborative project aims to develop a prototype solution for the Company (moving from TRL 3 to 5)

















Useful Links

Below are some links you might find useful:



Website <u>www.thedatalab.com</u>

DataFest <u>www.datafest.global</u>

Data Lab News <u>www.thedatalab.com/news</u>

Case Studies <u>www.thedatalab.com/case-studies</u>

Resources Hub www.thedatalab.com/resources-hub

Podcasts <u>www.thedatalab.com/podcasts</u>

Data Lab MSc www.thedatalab.com/the-data-lab-msc

Learning Journeys www.thedatalab.com/learning-journeys







Q & A discussion

Final comments

Joanne Boyle

Digital Health & Care Innovation Centre

Final comments

- Thank our audience for joining us
- Thank our speakers









Take our post event survey

• Scan the QR code →

Or

• Enter:

https://www.surveymonkey.co.uk /r/Post HAIC Event Survey











Join our digital health and care network

• Scan the QR code →

Or

• Enter:

www.dhi-scotland.com/join-our-network













Visit our HAIC webpage

• Scan the QR code →

Or

• Enter:

www.dhi-scotland.com/innovation/innovation-clusters/healthy-ageing/













Join our private LinkedIn HAIC Group

• Scan the QR code →

Or

• Enter:

www.linkedin.com/groups/12496744/













Networking