



**Ideas & Innovation Event on the
Indoor & Outdoor Spaces theme**

28th May 2026

**UCL Institute of Education (IOE),
London**

9.30 - 10.00am	Arrival, registration, refreshments.	Arrival Impact Dots
10.00-10.05 am	Welcome and Resources - Clare Hammerton	
10.05- 10.15 am	Introduction to BRIDGES Dementia Network and the aim of the day Dr Jennifer MacRitchie (BRIDGES)	
10.15 - 10.25 am	What technology means to me - Lynne Hagan	
10.25 -10.40 am	Indoor / Outdoor Spaces. Technology & Dementia. Six Choice Themes Prof. Tao Cheng (BRIDGES) & Associate. Prof. Hua Zhong (BRIDGES) 1. Air Quality. Thermal. Ventilation (Indoor) 2. Digital. Sensory. Lighting (Indoor) 3. Navigating Confusing Spaces (Indoor) 4. Neighbourhoods. Gardens. Routes. Autonomy (Outdoor) 5. Communications and Assessment of situations (Outdoor) 6. Low-cost Adaptations and Technologies for private housing	
10.30 -10.50am	Who is in the room? Getting to know more about us. -All	
10.50 - 11.00am	Refreshments	
11.00 - 12.15pm	Theme Developments and Sharing - All	
12.15 -1.30pm	Lunch and Networking	
1.30 - 1.40 pm	Funding Call BRIDGES - Dr Jennifer MacRitchie (BRIDGES)	
1.40 - 2.40pm	Deeper Theme Developments - All	
2.40 - 3.20 pm	Sharing Developments, Comments, and Feedback	
3.20 - 3.30 pm	Refreshments & Considerations	
3.30 - 3.40 pm	Learning Summary Prof. Tao Cheng (BRIDGES) & Associate. Prof. Hua Zhong (BRIDGES)	
3.40- 3.50pm	Next Steps, Funding Call - Dr Jennifer MacRitchie (BRIDGES)	
3.50-4.00pm	Close - Clare Hammerton	Departure Impact Dots

Contents

1. Rationale for the event

2. Event summary

THEME 1: Indoor Air Quality, Temperature, and Fresh Air

THEME 2: Indoor Digital Tools and Multi-Sensory Support

THEME 3: Indoor Navigation of Confusing Spaces

THEME 4: Outdoor Neighbourhoods, Gardens, Routes, and Autonomy

THEME 5: Outdoor Communication and Checking In

THEME 6: Low-Cost Adaptations and Technologies for Private Housing

Strategic Cross-Cutting Takeaways

3. Capture of ideas

1. Rationale for the event

The BRIDGES Network+ challenges the traditional focus on basic physical needs that result in technologies primarily used for safety, surveillance and monitoring. Instead, we aim to empower people with dementia to be in charge of what they want to do by co-designing technologies that support holistic health, social connection, and continued participation in communities.

This event was dedicated entirely to our first core theme: **Indoor and outdoor spaces**. Indoor and outdoor environments can be confusing to navigate and often present challenges such as poor natural light, uneven surfaces, changing light conditions, and lack of seating.

We envision indoor and outdoor environments that not only support safety, but actively enable people living with dementia to navigate, connect, and participate in everyday life with confidence and dignity. By combining advances in design, environmental science, and intelligent technologies, we aim to move towards more responsive, personalised, and empowering spaces.

For this event, we moved beyond the traditional medical model of basic passive monitoring, focusing instead on active empowerment. We sought project ideas that bridge environmental science, digital innovation, and community integration. Project directions could include layout design and the built environment, space safety and positive risk-taking, navigation technologies, and communication and social interaction.

In particular, we wanted to encourage innovative approaches to navigation that span indoor and outdoor environments. Advances in artificial intelligence, such as computer vision and large language models that can adapt to the communication styles and language needs of people living with dementia—offer new opportunities to provide context-aware, personalised support,

enabling the right level of assistance at the right time. Such approaches could help people with dementia navigate complex environments more confidently, supporting independence, dignity, and continued engagement with their communities.

By bringing together academics, health and social care professionals, technology sectors, policymakers, community organisations, and people with lived experience of dementia, we aimed to co-design innovative ideas to prepare for the upcoming Summer Feasibility Funds call for small projects.



2. Event Summary

This summary synthesises the insights and takeaway messages from the workshop focused on improving indoor and outdoor environments for people with lived experience of dementia through better design of indoor and outdoor spaces and technological innovation.

THEME 1: Indoor Air Quality, Temperature, and Fresh Air

Invisible conditions can affect comfort, mood and behaviour.

Stuffy air, the room getting too hot or cold, or poor ventilation can make us feel unsettled, tired, or distressed.

Groups on Table 1 talked about how we can monitor these "invisible" things to keep our homes healthy and comfortable, whilst making sure we don't make heating bills too expensive.

- A. Localised & Responsive Environments:** Standardised heating, ventilation and air conditioning systems fail because individuals have vastly different micro-climate preferences (e.g., one prefers hot, another fresh air). Solutions require localised thermal conditioning (like smart thermostats) and responsive zoning.
- B. Automated Comfort & Stress Detection:** Technology could automatically assess environmental comfort in real time. It could predict and prevent distress by analysing physical indicators of heat or cold stress (e.g., shifts in behavioural patterns or changes in biological measurements from an individual).
- C. Passive & Sustainable Infrastructure:** Affordable retrofitting, such as high-quality insulation, solar panels, backup batteries, and passive solar shading (curtains), is

critical to keep running costs low and ensure safety during technology or power failures.

THEME 2: Indoor Digital Tools and Multi-Sensory Support

Make rooms easier to read without making them clinical

This is about the things we can see and feel in a room.

Groups at Table 2 talked about how to make indoor spaces easier to understand and live in, for instance, using good lighting, clear contrasts between floors and walls, and avoiding confusing patterns. We also explored how simple digital tools can help create a calm space that isn't overwhelming to the senses.

- A. Sensory Regulation & De-escalation:** People with lived experience of dementia frequently experience visual and auditory sensory overload. Proposed "Calm Glasses"- Augmented Reality (AR) and Virtual Reality (VR)- paired with smart hearing aids could actively filter out household clutter and environmental noise, or stream soothing nature scenes and soundscapes.
- B. Circadian & Navigational Lighting:** Lighting could shift dynamically across seasons and times of day to protect sleep cycles (to counteract low melatonin and blue light issues). Key innovations include low-intensity, automated infrared floor lighting (similar to airplane exit paths) to guide night-time bathroom trips without disrupting sleep.
- C. Dynamic Multi-Sensory Spaces:** Integrated systems using natural scents (flowers, savoury aromas), soft music, and adaptive lighting could actively detect agitation and automatically shift the environment to a calming state.

THEME 3: Indoor Navigation of Confusing Spaces

Hospitals, supermarkets and unfamiliar buildings can create too many decisions. Big indoor places like supermarkets, hospitals, or unfamiliar buildings can be very tricky and stressful to get around.

Groups at Table 3 looked at how simple technology, like an easy-to-use app on a mobile phone, could give gentle, step-by-step directions to help you find your way safely and confidently.

- A. Active Guidance over Passive Support:** The overarching ethos is "helping you to help yourself." Instead of doing tasks for the individual, technology should offer personalised, active prompts via voice, pointing, and directional lights to promote physical activity, fun, and autonomy.
- B. Dementia-Friendly Public Infrastructures:** Navigating complex public zones (supermarkets, hospitals, airports) may be confusing. Digital tools could provide clear wait-time notifications, map out simplified paths, and flag physical obstacles in real time.
- C. Socially Assistive Robotics:** Tele-presence and shopping-assist robots can reduce the impact of social isolation for those living alone by allowing them more independence outside the home. Robots may help people navigate shopping aisles by visually recognising changing item locations on shelves, and safely guide individuals back to a central help desk if they become disoriented.

THEME 4: Outdoor Neighbourhoods, Gardens, Routes, and Autonomy

Going outside should support confidence, purpose and connection. Going outside should be a joy, not a worry. Groups at Table 4 talked about how our local streets, parks, and gardens can be designed or upgraded so people can enjoy the outdoors.

We want to focus on "positive risk-taking"—supporting people to keep their independence, get fresh air, and stay connected to their community, rather than simply keeping people locked indoors to be "safe".

- A. Passive Hazard Mapping:** Predictive tools like "Navigation Goggles" or specialised apps could passively collect data on pavement quality (uneven surfaces, clutter) during everyday use. This crowdsourced data could generate evidence to influence local authorities to optimise urban infrastructure investment.
- B. Personalised Safe Routing:** Artificial intelligence assistants could generate short, highly customised outdoor trips prioritised by the user's specific mobility, vision, and cognitive needs.
- C. Inclusive Public Havens:** Creating designated, highly secure spaces (such as intergenerational "playgrounds" or park zones) equipped with automated crisis-reporting technologies that flag sudden falls or unconsciousness.

THEME 5: Outdoor Communication and Checking In

Support should be available without taking over. When you are out and about, it is comforting to know support is there if you suddenly need it.

Groups at Table 5 discussed friendly technologies that can check in on how you are feeling, use calm and reassuring words to guide you, and automatically alert a family member or carer only if you actually need a helping hand.

A. The "Talking Diary": A visual and vocal scheduling tool designed to seamlessly organise routines, medication, and meals. It could boost user confidence, serve as a shared life document for carers, and prevent the anxiety of missed plans.

B. Aversion to Complex Wearables: Some older adults reject complex wearable tech, tracking devices, or high-maintenance smartphones. Devices must rely on simple, highly tactile, and instantly recognisable interfaces, such as localised physical "Red Buttons" for emergency help.

THEME 6: Low-Cost Adaptations and Technologies for Private Housing

Small changes should work in ordinary homes and ordinary budgets. Most of us want to stay living in our own private homes for as long as we possibly can.

Groups at Table 6 focussed on clever, affordable tweaks and low-cost gadgets that can be added to an everyday house to make daily life that little bit easier and safer, without needing a massive budget to completely rebuild the home.

A. The "Tri-Light" Concept: A low-cost, traffic-light-style desktop device providing real-time feedback. Locally, it monitors ventilation (CO₂), thermal comfort (°C), clutter,

open doors, and falls. Remotely, it escalates critical alerts outward in a loop from family and carers to emergency services or maintenance teams.

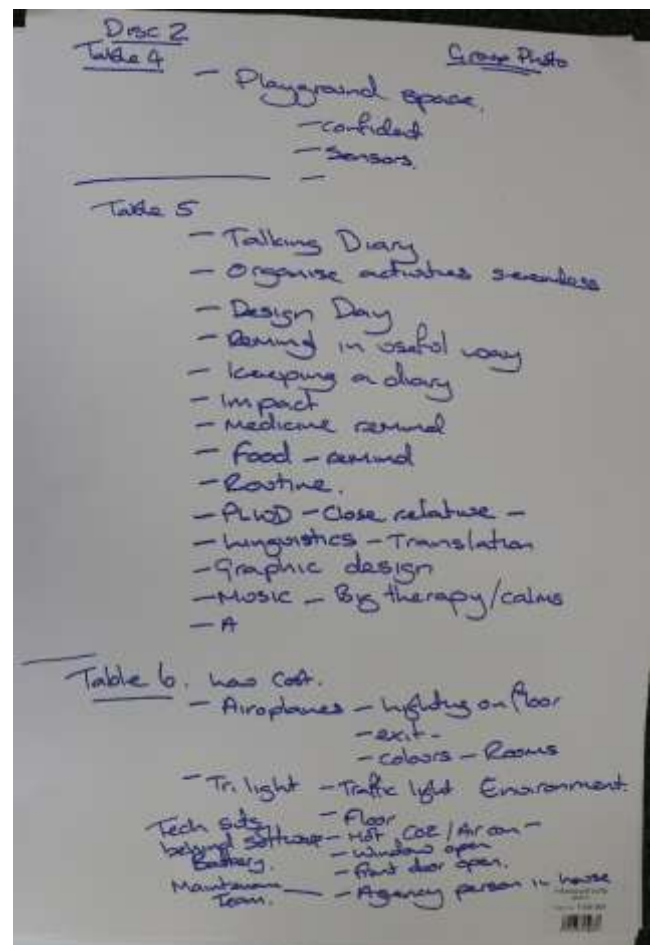
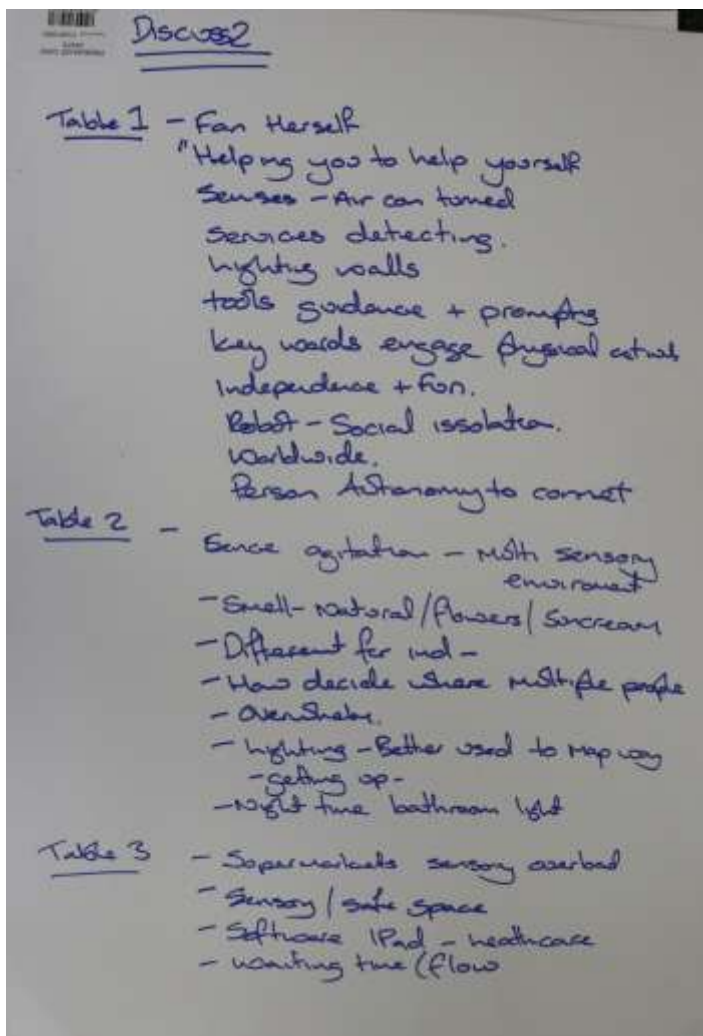
- B. Embedded & Invisible Tech:** Avoid intrusive hardware. Instead, embed everyday tech behind existing structures, such as integrating infrared presence sensors directly into standard lightbulbs to track safety without cluttering the home.

Strategic Cross-Cutting Takeaways

- 1. Universal Value ("Everyone Benefits"):** Features designed to reduce the impact of living with dementia, such as clear environmental feedback, cleaner air, and intuitive routing, help improve the quality of public and private spaces for the entire population.
- 2. Co-Design is Mandatory:** Solutions cannot be engineered in a vacuum. True innovation requires the active, paid collaboration of people with dementia, family carers, technology developers, local councils, linguists, graphic designers, and psychologists to ensure tools are culturally and cognitively accessible.
- 3. Ethics, Privacy, and Equity:** As data-driven monitoring scales, workshops must address the ethics of data consent. Furthermore, guidelines must ensure these technologies are rolled out in an equal manner across the UK to prevent a "postcode lottery" regarding who has access to high-quality care ecosystems.

3. Capture of ideas

Below are the photographs of table discussions on the day. These are synthesised into the takeaways above, and included here for additional detail.



PROBLEMS

- UNEVEN SURFACES, CLUTTERED PAVEMENT
- PERIPHERAL VISION ISSUES
- LOW PRIORITY FOR COUNCILS
- LACK OF UP-TO-DATE DATA
- LACK OF DETAILED DATA ON SPECIFIC INFRASTRUCTURE SUCH AS LIGHTING
- LACK OF KNOWLEDGE OF AVAILABLE SERVICES

SOLUTIONS

- PERSONALISED SAFE ROUTES
 - MOBILITY, VISION ETC AS PRIORITIES
- ADVISORY GROUPS TO DESIGN SAFE ROUTES
- A PLACE TO GO TO GET UP TECH.
- AI ASSISTANT - USEFUL FOR ROUTING - SHORT TRIPS
- UP TO DATE - FREQUENTLY UPDATED DATA
- SIGNPOSTING - CLEARER
- MORE INFO + AWARENESS SESSIONS

AIM: TO ASSIST PEOPLE WITH DEMENTIA IN NAVIGATING OUTDOOR SPACES.

- TO MAP THE IMPORTANT FEATURES OF THE ENVIRONMENT PASSIVELY. (E.G. UNEVEN SURFACE, PAVEMENT CLITTER).
- TO INVOLVE PEOPLE WITH DEMENTIA, CAREGERS, RELEVANT AUTHORITIES & TECH COMPANIES
- TO GENERATE EVIDENCE TO DIRECT RESOURCE ALLOCATION

IMPACT:

- ADVICE ON HOW TO USE THE APP
- IMPROVED CONFIDENCE IN OUTDOOR NAVIGATION
- LOWERED RISK OF ACCIDENTS.
- IMPROVED INDEPENDENCE
- IMPROVED DATA - CAN BE USED FOR OTHER LINKED PURPOSES.
- MORE TARGETED INVESTMENT IN THE URBAN DOMAIN

WHO SHOULD BE INVOLVED?

- PEOPLE WITH DEMENTIA TO HELP SET DESIGN & IDENTIFY REQUIREMENTS
- LOCAL AUTHORITIES
- TECH COMPANIES / APP DEVELOPERS
- CAREGERS
- DISABILITY GROUPS
- ACADEMICS TO

Table 5 - Independence

- outdoor spaces
- Technology normal behaviour - Alert App
- Alert

Table 4 - Navigation Goggles

- outdoor spaces
- Passively collect data - passively
- Generate Data - evidence - feedback
- Tech / AI / mentors / profile living / App developers
- Improved confidence / independence
- Alternative route

Table 3 - No-one

- Social assisted roads - shopping
- Museum / Airports
- Location of items
- Blend in
- Help desk -
- Tell people obstacles
- Black matt
- Automatic totalling

Table 2 - Carer

- Visual clutter + noise
- Calm glasses - smart hearing aids
- Bring down level of Hearing Aids
- Wise filter to reduce clutter

Table 1 - All seasons

- Heat + light - Personal Behaviour
- Energy efficient Candles
- Comfortable
- Insulation - Radiators / Solar Panels
- AI / Automation / AI / Automation

4 ②

Designated Areas in Parts

(Planned for)

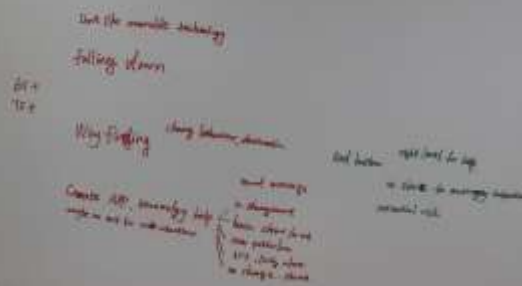
- Demerit people
- 8-9 group
- Disabled people

(Red Button Area)

Technology will be introduced
to enable cross report automatically
to such as self help system or
some internet. People will feel safe

Last authority, Demerit People (Others)
Designer, Test People

TABLE 5



5② TITLE: TALKING DIARY

AIM: TO HELP YOU ORGANISE YOUR ACTIVITIES IN A SENSELESS WAY

- TO REMIND YOU OF ACTIVITIES IN A USEFUL WAY
- TO KEEP TRACK OF ACTIVITIES YOU HAVE COMPLETED
- VISUAL VERSION OF THE RECORD

IMPACT:

- CONFIDENCE FOR FAMILY MEMBERS OR CAREERS
- CONFIDENCE IN THEIR PLANS - NOT MISSING THINGS
- A WAY TO BELIEVE YOUR LIFE - COULD BE SHARED WITH CAREERS

WHO SHOULD BE INVOLVED?

- PEOPLE WITH DEDICATION FOR VICE REQUIREMENTS
- CAREERS
- LIAISON
- GENERAL REQUIREMENTS
- SOCIAL REQUIREMENTS/REQUIREMENTS



TABLE 6②



Many not be aware of their environment, this device provides a real-time feedback on how to interact with your environment.

Different setups could exist: A. Local & B. Remote



- Ventilation (CO2)
- Thermal Comfort (°C)
- Clutter
- A goal
- Door left open etc.
- Presence sensor.

Peggy Coles
SARA HAYBALL
ELAINE MATOS
ANDY LOVE

ANDY LOVE

Andy - Phases
Everyone benefits - (most)
Value greater
Sitting next - everyone best

Stewart - All over the
Postcard lottery

Max - Information Warfare
Value
- Space Wars
- Data Connect
- Ethics
- Code design
- (everyone) belongs to the
- Connected
- Broad Pop - Spaces ignored
- Masses

Sam - Restructure
Help put together
Deep overlaps
Old Standard
Support program business

Coco - ecosystem
Innovation

We would like to thank the Engineering and Physical Sciences Research Council (UKRI689), the National Institute for Health and Care Research, and the Alzheimer's Society for funding the BRIDGES for Dementia Network+, which enabled this workshop.

