

Universal Design – or Design a Universe?

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Access to London Underground

- Testing ramps for London Underground stations
- What gradient?
- How do people with different capabilities respond to them?



Experiment about platform gradients for people with vision challenges and their assistance dogs

Footway surfaces



Experiment with different kinds of footway surfaces

- Damage to ankles, knees, hips, pelvis from a lifetime of walking on inappropriate surfaces
- Can we reduce this damage and make falls in older age less likely?
- How about wheelchair users?

Hearing



Experiment about how people can hear in restaurants

- Hearing aids are tuned to the human voice
- What happens when there are a lot of human voices?
- What happens when you visit a restaurant?

Where am I?

- Spatial memory
- How do we remember where things are?
- What about losing that capability?
- How can the environment help?



Experiment about how people remember space

Dementia is all about people



People with dementia making their lunch in a Group Home in Fujinomiya, Japan

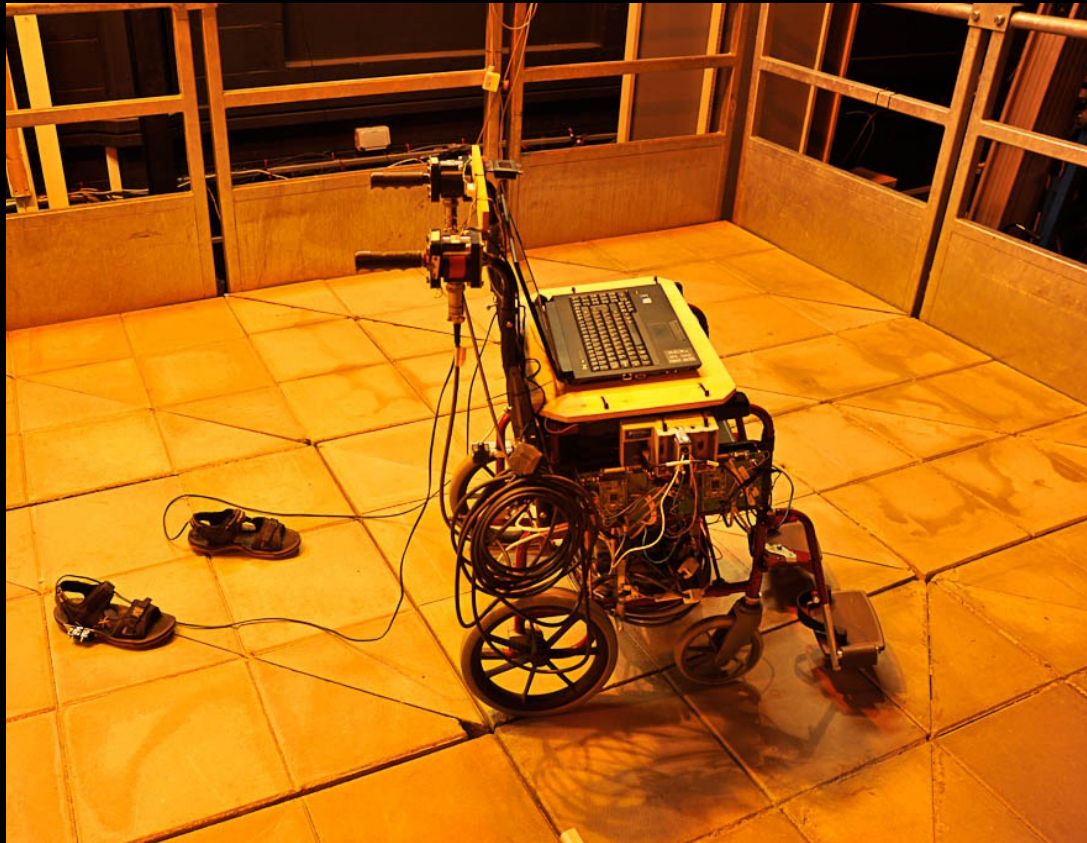
Movement

- Movement with crutches
- Hand grips
- Enjoying life



Use of crutches in sports helps to guide design for other users

Movement – pushing a wheelchair



- How about the person who pushes someone in a wheelchair?
- Massive forces needed all the time because of the way we design footways

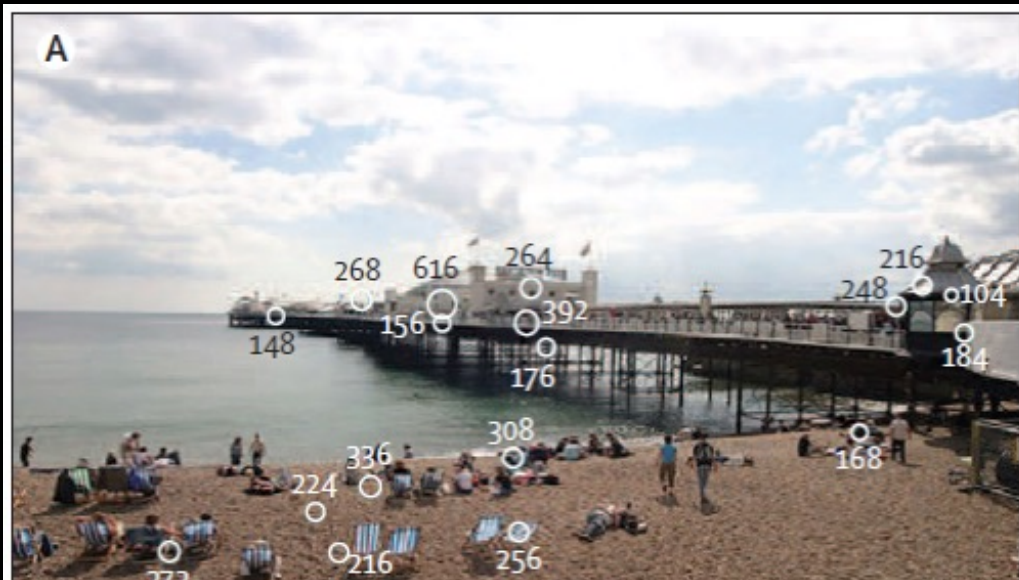
Measuring the forces applied to push a wheelchair under different environmental conditions

Navigation with and without dementia

- How does a person with dementia navigate?
- Very different from someone without dementia
- Can we understand what they use as cues?
- How does their head move?
- How do they see?



How does a person with dementia see?



Control

How the eye works – this shows fixations on a scene

How does a person with dementia see?



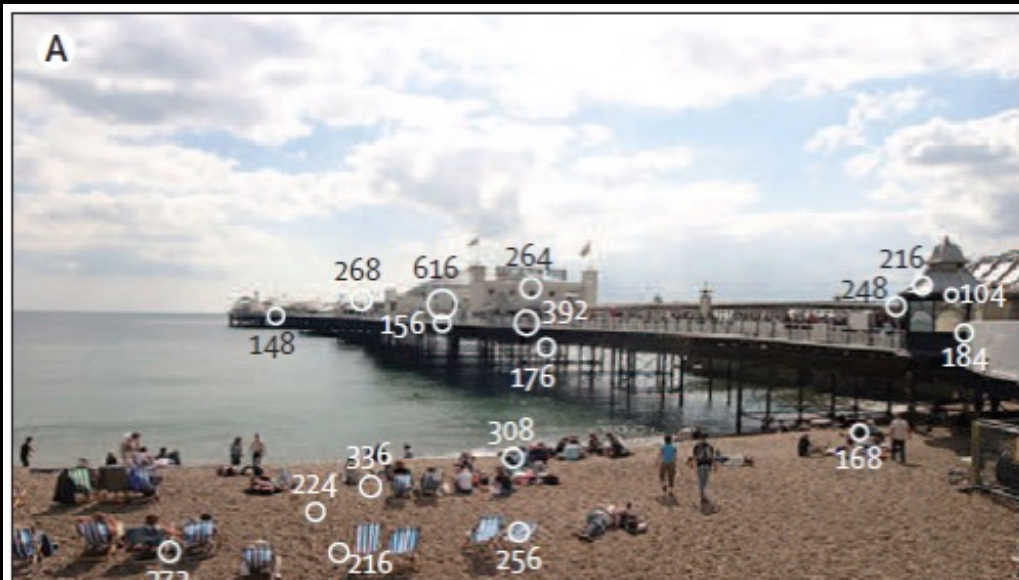
Control



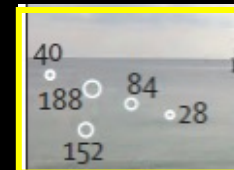
Person with PCA

This shows how someone with PCA fixates on the same scene

How does a person with dementia see?



Control



... and this means that this is the only information they actually receive

Person with PCA

Falling over in buses



Experiment about people moving about inside a moving vehicle to alter the way buses accelerate

Multisensorial environments – PEARL

- Physical environment
- Lighting
- Sound/Acoustics
- Movement
- Smell
- Feel
- Scale
- Ventilation



Examples of physical and lighting environments in PEARL

Multisensorial environments

- Physical environment
- Lighting
- Sound/Acoustics
- Movement
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- Feel
- Scale
- Ventilation



The sound and acoustic systems in PEARL allow us to simulate many different dynamic environments

Design a Universe

Create the worlds that people imagine – with the capabilities they have

Thanks!



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There is a choice of entry footway to PEARL – a softer or a harder surface: which do people prefer?