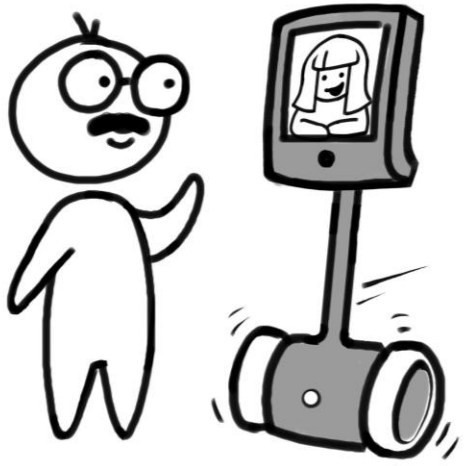
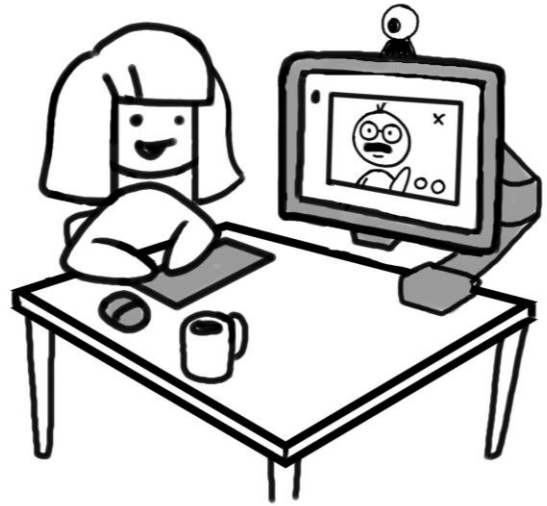
Mobile Robotic Telepresence for Hybrid Meetings

- Mobile Robotic Telepresence refers to **video-conferencing** systems mounted on simple, **remotely-controlable**, **mobile** bases
- This allows the user to have a **physical embodiment** in a remote location and to `**freely' move around** in that location
- Many models have been commercially available over the last decade.
- In theory, the affordances of this technology should make it a more effective communication medium over traditional video-conferencing.
- Yet this technology remains under-utilised. Why?





Research Overview

- Throughout my PhD I conducted several studies, to understand the **value** and **barriers** of using mobile robotic telepresence.
- I have conducted interviews with long-term users, short-term users and non-users, as well as usability testing, a deployment ethnography and a co-design workshop.
- My analysis takes a **holistic approach**, looking at the details of interaction as well as the broader context of **users' environment**, **routines** and **needs**.
- I also draw influence from literature on groupware, workplace studies, non-use and ethnomethodology.

High-level insights

- The current design of Mobile Robotic Telepresence models offers **limited value** in office environments.
- The **movement affordances do not align** with the ways in which people need to move in work meetings or in social interactions.
- Using this **technology requires a lot of help and support from other people** in ways that are disruptive to work routines.

Workshop brainstorm ideas for improvements

User Persona 1 – The Adept Remote Worker

Mark Ward
Age: 42
Gender: Male
Occupation: Software Developer
Location: Seattle
Work style: fully-remote

Attitude to technology:

- Mark is always keen to explore new technologies. He is an early adopter, willing to try even unfinished systems and adapt them to his lifestyle needs.
- As a remote worker, he is particularly interested in innovative solutions for remote communication.

Background:

- Mark works from home, so that he can be near his family. His work can be done remotely, but he has regular online meetings with his colleagues to catch-up on project objectives or problem-solve together.
- As a software developer at a big tech company, Mark spends most of his time creating and testing code.
- He communicates with his colleagues through email and chat or through video-calls, where he might share his screen.

Needs:

- Missing out on 'watercooler' interactions at the office, Mark wants to ensure he is included in work-related conversations and decision-making.
- He also wants to establish friendly social connections with his colleagues, which is difficult to do during work meetings.

Situation:

- Mark's company has a telepresence robot, which Mark uses regularly in order to be seen as 'present' and 'available' by his office colleagues.
- Driving the robot is very time consuming, and he often finds himself in awkward situations where people at the office treat him like a robot rather than as a person.

User Persona 2 – The Busy Hybrid Worker

Imogen Thomson
Age: 37
Gender: Female
Occupation: UX Designer
Location: London
Work style: Hybrid

Background:

- Imogen works 3 days per week at the office and 2 days from home. She likes to plan all her meetings in-person on the days she is at the office, and use her 2 days at home for solitary, focused work.
- As a UX designer her work involves building product prototypes using both physical (paper, Lego) and digital tools (Figma).
- She often has to travel to other sites, to host co-design workshops with prospective users and other designers.

Attitude to technology:

- Imogen has a lot of experience with technology and can quickly learn to use new systems.
- However, she feels that the increased prevalence of technology is harming her quality of life.
- Working in a fast-paced field, she does not have time to test technologies that might disrupt her workflows.

Needs:

- Traveling is time consuming. Imogen, is looking for solutions that will allow her to supervise workshops remotely, just as effectively as if she was there in-person.
- Whilst being able to move around a table is useful. She would also like to be able to point at and manipulate prototypes.
- Imagen needs technology that does not add to her workload.

Situation:

- Imogen's company has a telepresence robot. She used it one time, when she was on a work trip, in order to participate in a design activity happening back at the office. It was preferable to missing out on the activity.

Actionable Insights (selected)

- **Relevant forms of movement**: Instead of large movement (e.g., across a room), implement smaller, more meaningful movements (e.g., neck turning to indicate attention, movement across a table)
- **Object interaction**: pointing, contactless interaction with smart devices (e.g., opening doors)
- **Integration into office ecosystem:** portal for IT and Office Administration to monitor use of the devices and ensure safety and equity standards are followed, ability to include device when sending calendar invites and booking meetings rooms, ability to access meeting chat and file sharing when attending a meeting with the robot device (e.g., integration is MS Teams)
- **Appropriate onboarding:** provide office employees with guidelines around when and how to use the robot device, as well as how to treat other device users appropriately
- **Automated driving:** reduce the burden of driving the device with option to have the robot navigate to selected locations autonomously or follow other users (some systems have implemented this)
- **Transparency:** the device should signal to people around it when it is losing signal or has trouble moving through an area (e.g., so that people can move objects out of its path).