TARICS: Trustworthy Accessible Robots for Inclusive Cultural experienceS

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Lindsey the Tour Guide Robot

Lindsey is an autonomous robot deployed at The Collection museum in Lincoln providing guided tours and information about the items displayed in the museum [1].

The deployment started in 2018, totalling to-date:

- **5 008 successful tours performed**
- **31 154 tasks completed autonomously**
- **446 days (1.2 years) of operation**
- **1 118 km distance travelled**

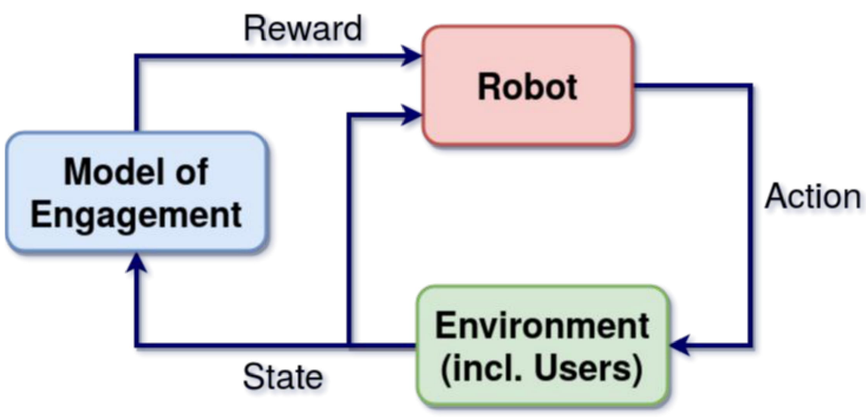
Lindsey at the charging station (left) and interacting with school children (right).

Learning on the Job

The robot behaviour is adapted in real-time during the interactions to select the actions expected to be the most engaging for users. The user engagement is assessed by a learned regression model trained from real data from the museum interactions [2], and a Reinforcement Learning model optimises the robot policy by maximising the user engagement [3].

After 2 months of learning, it was observed:

- **22.8% increase duration of the tours**
- **30% increased probability of completing the tour**



Reinforcement Learning loop to learn from user engagement.

Increasing Accessibility

Despite the importance of cultural visits for people's life experiences, there are barriers for accessing, enjoying, and engaging with these visits for people with Learning Difficulties or Disabilities and/or autism [4].

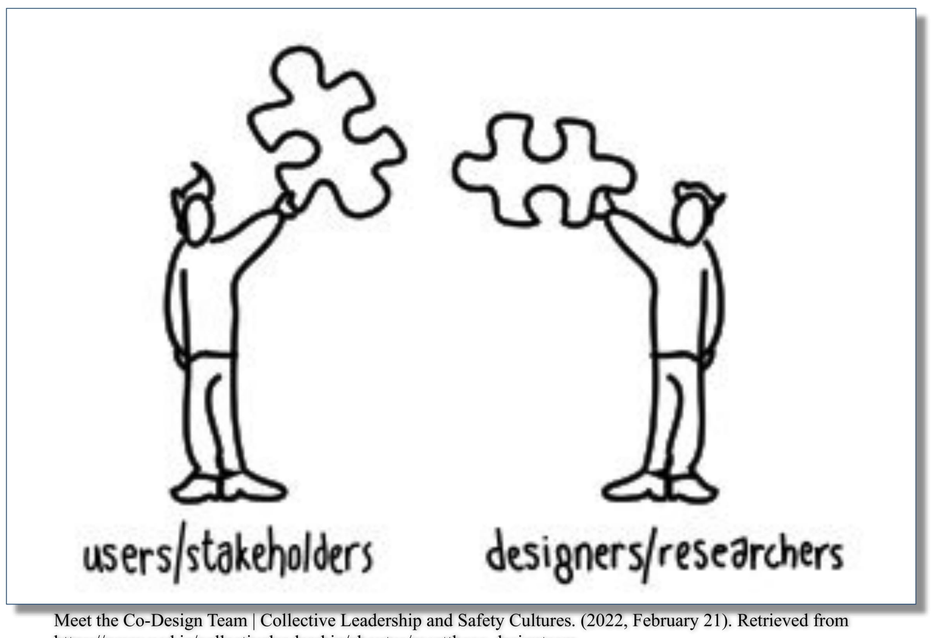
To alleviate this issue, the **project goal** is:

Co-creation of personalised visits to museums for people with Learning Difficulties or Disabilities and/or Autism

Approaches that will be explored for increasing accessibility includes:

➔ **Use of adaptive systems**[5,6] **(such as robots**[7] **& VR)**

➔ **Participatory research and design** [8]



Meet the Co-Design Team | Collective Leadership and Safety Cultures. (2022, February 21). Retrieved from https://www.ucd.ie/collectiveleadership/aboutus/meettheco-designteam

Co-Design Activities

A first **co-discovery** meeting will be held with relevant stakeholders (i.e. NICER group[1] and local schools) to understand their:

- **perception of the robot**
- **physical barriers**
- **inhibiting factors**
- **engagement with current robot tours**
- **preferences**

The expected outputs are:

➔ **Guidelines for robot interactions design**

➔ **Prototype of accessible robot-guided tour**

[1] Nottingham Interactive Community for Education Research (NICER) group

References

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