UNDERSTANDING INTERACTIONS OF PEOPLE WITH DEMENTIA WITH MIXED REALITY TECHNOLOGIES: AN OBSERVATIONAL STUDY

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INTRODUCTION

- Mixed Reality technologies could support people with dementia.

Task Sequencing Issues  Short term memory problem
WHAT ARE MIXED REALITY TECHNOLOGIES?

(Desai, Blackler, & Popovic, 2016)
ELEMENTS OF MIXED REALITY SYSTEMS - OSMO

Physical Control Element

Coupling

Virtual

Physical World:
seven flat shapes-tans

Stand

Tablet/Smartphone

Virtual World:
Tangram app

Reflector
ELEMENTS OF MIXED REALITY SYSTEMS
METHODOLOGY

- Nine people with dementia (MoCA = 13 to 25, mean MoCA = 21, age = 63 to 92 years, mean age = 79)
- Observations and verbal protocols
- Games of two technologies
  - Tangram on Osmo
  - Young Conker on Hololens
TANGRAM ON OSMO — START OF THE SESSION
TANGRAM ON OSMO — END OF THE SESSION
ANALYSIS

- Thematic analysis for
  - **Control factors** – degree of control, Immediacy of control, Anticipation of events, Mode of control, Physical environmental modifiability
  - **Sensory factors** – Sensory modality, Environmental richness, Multimodal presentation, Consistency of multimodal information, Active search
  - **Distraction factors** – Isolation, Selective attention, Interface awareness
  - **Disorientation**
FINDINGS - OSMO

- Control factors –
  - Materiality and physicality of objects, used as scaffolds
  - Familiarity
  - Initial adaptation
  - Difficult to stay within Line of View (LOV).

- Sensory factors –
  - Visual, Audio and tangible clues
  - Visual clues were difficult to understand, often undetected
  - The audio clues were quick in getting attention

- Distraction factors –
  - Action and feedback are not co-located, but only at the start

- Disorientation
FINDINGS - HOLOLENS

- Control factors –
  - Gestural interactions
  - Speech interactions
  - Gaze
  - Need appropriate prompts/clues when to use which control mechanism

- Sensory factors –
  - Visual
  - Audio

- Distraction factors –
  - Headset left a mark on the nose at the end of the session.

- Disorientation

“There is too much happening here..” (ASDR_P2)
SUMMARY

- Simplify control and sensory factors
- Physical manipulation and gestural interactions could be used for control factors
- Audio could be used for sensory feedback
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