Memory Training for Adults with Mild Cognitive Impairment (MCI) using Augmented Reality (AR)

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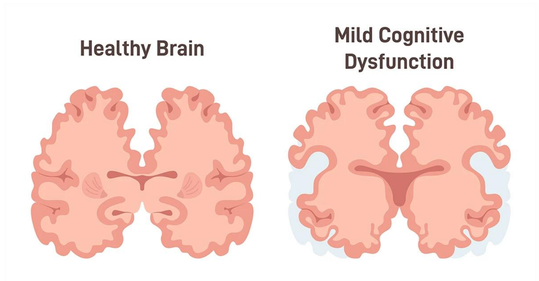
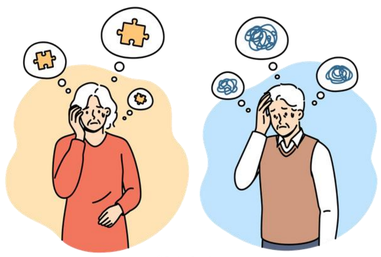
Motivation



Healthy brain vs brain with MCI [1]

- **Mild Cognitive Impairment (MCI)** is a growing concern among senior adults, as it can lead to more severe memory conditions such as Alzheimer's disease or dementia.
- MCI is the stage where an individual's cognitive abilities, such as memory and thinking are more impaired than normal, but not severe enough to be diagnosed as Alzheimer's or dementia [2].
- Studies suggest that combining AR with physical activity has the potential to enhance not just physical and cognitive functions, but also emotional wellbeing. However, this approach has rarely been applied to memory support tools for older adults with MCI [3].



- According to statistics, the global ageing population is expected to reach 1.4 billion by 2030, meaning that 1 in 6 people will be aged 60 or older. This number is expected to double by 2050, and the number of people with dementia is projected to reach 152 million [4].

- With this growth, there is an increasing need for interventions that support memory function in adults aged 60 or older with MCI.

Existing cognitive training interventions have three main goals :

- Help healthy people prevent cognitive decline.
- Provide a therapeutic tool to help people with cognitive impairments stay active and slow down the decline.
- Provide users with information or assessment about their cognitive health and help them learn about different cognitive disorders.

Research

Augmented Reality (AR)

Augmented Reality (AR) is a technology that combines virtual and physical world by including computer-generated objects in the real world [5].

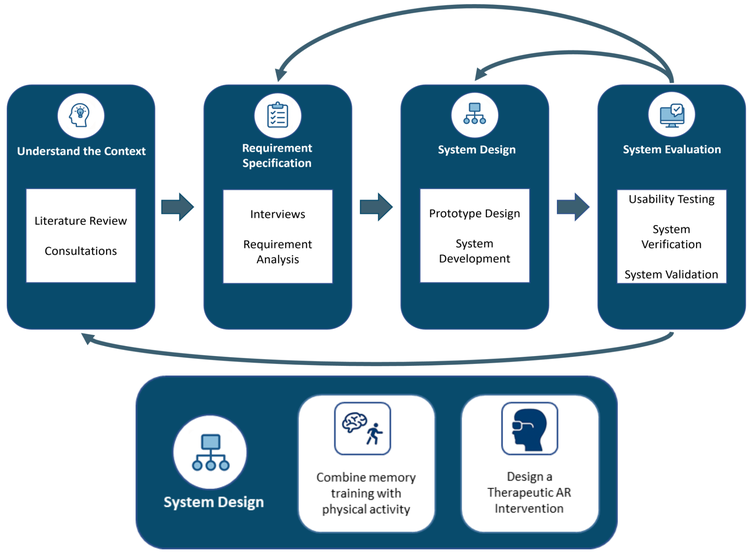
Adults engaging with AR-based interventions for cognitive and physical support

Proposed Solution

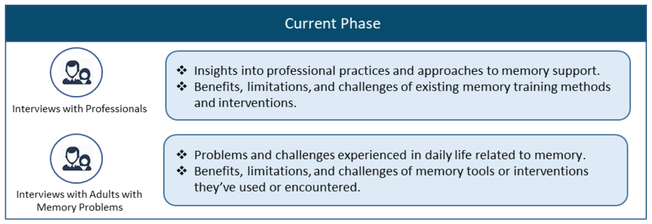
The proposed solution is a therapeutic AR that combines memory and physical tasks to help maintain memory function and physical activity levels in older adults with MCI, supporting them in staying active.

Methodology

This research follows a User Centred Design process [6], involving interviews with professionals and older adults, followed by the design, testing, and validation of the AR application with adults with MCI.



Phases in User Centred Design [6]

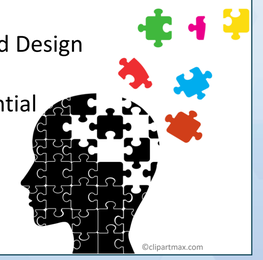


Research Objectives

This research explores how **Therapeutic AR** can be used to create meaningful, engaging, and accessible memory support tools that also encourage physical movement and support everyday independence.

The objectives of this research are to :

- **Investigate** how combining memory training with physical activity can help maintain memory function and physical activity levels in older adults with MCI.
  - Literature and interviews.
- **Design** and develop a therapeutic AR intervention that integrates both cognitive and physical engagement.
  - AR intervention following User Centred Design (UCD) approach.
- **Evaluate** the usability, engagement, and potential benefits of the developed intervention.
  - Conduct user studies with adults with memory problems.



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