MIMS Final Project Proposal: Memorology

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Background

6.2 million Americans over 65 years old are living with dementia in 2021, and is projected to grow to 12.7 million by 2050. This leads to increased medical cost to the nation, which is estimated to be $355 billion in 2021 as well as loss of productivity of caregivers. Furthermore, the disconnection between family members due to the Covid-19 pandemic exacerbates the situation, as dementia deaths are reported to have increased 16% in the United States (Alzheimer Association, 2021).

In the case of most progressive dementia, including Alzheimer's, there is no cure. However, multiple studies have shown that gamification approach is beneficial for patients with dementia in maintaining their cognitive ability. (van Santen et al., 2014 & Paliokas et al., 2017 & Dartigues et al., 2013) Furthermore, considering the patient's condition, the game elements should not be complicated and overwhelming such as electronic accessories that may confuse or frustrate them (Graying with Grace, 2021).

Hence we propose memorology. Memorology aims to help patients with degenerative memory diseases like dementia remember their past (i.e., events, places, people, feelings, milestones) via a tangible user interface through gamification concepts to engage both patients and their caregivers as part of the patient's treatment plan and also provide ways to socialize and have fun with friends and family.

Proposed deliverables:

- A multiplayer game for dementia patients to slow down their memory loss which can be played with caregivers asynchronously and remotely.
    - We chose to engage caregivers as well because dementia patients in a qualitative research study have cited the importance of "meaningful activity and social interaction" for addressing needs raised by dementia "outside of the healthcare system" (NIH Quality of Life Research, 2017). This speaks to the importance of play (addressed via the gamification we will explore in our project) and social support (addressed via caregiver involvement with the patient).
- Includes tangible elements which are not only familiar to users but also provide easier controls than the digital-only counterparts

    - We chose to focus on the tangible UI instead of digital because sensory stimulation therapy is a recommended treatment for dementia patients. It allows them the ability to use familiar and ingrained senses to trigger remembrance. As such, we hope to engage with at least a few of the 5 senses like sight and physical touch as part of our project (Salmon Health & Retirement, 2021).
- Has a progress-tracking functionality which allows personalized treatment to patients as well as providing insights to medical professionals

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Project Members' Roles and Responsibilities

Name	MIMS Focus	Skills/Experience	Contributions
Ryan Qiao	PM, HCI	Product Manager, UX Research, Cognitive Sciece/ Neuropsychology, Video Production	- Domain knowledge + documentation - Tangible UI Design - Research + Coding
Vivian Omondi	PM	Software Engineer, Product Manager	- User research - Coding - Tangible UI - Product Design - Documentation
Junmei Li	PM	Product Design, Development, Test, and Launch; Project Management	- User research - Product design - Project coordination - Programming - Write-ups and presentations
Jihea Moon	UX Design, UX Research	UX Design, UX Research, Project Management	- User research (Literature review, Interviews, Usability testings) - Product design and prototyping - Documentation
Aoi Furukawa	PM/DS	Project Management, Data & Policy Analysis, Healthcare	- Research and experiment design - Data visualization - User research (Health policy review) - Coding

Detailed Description of Project as a Capstone and Integrative Experience

This project is an integrative experience because it encompasses and is a culmination of all the skills and knowledge we have accumulated in the MIMS program including:

- Tangible User Interface
- User Research
- Product Design
- Software Engineering
- Data visualization

Throughout our Capstone project, we will apply the skills as listed above to design our product and follow the entire software development lifecycle from understanding user pain points and requirements to iterative design, development, test, and finally a demo of our final product that we hope has real world applications and use.

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