Overview: COVID-19 disproportionally affects older individuals, with fatality rates of up to 18% for those over 70. Social isolation is the only reliable method of protecting these at-risk individuals, but isolation is a double edged-sword that leads to greater incidence of diseases like heart disease, diabetes, and cancer. Coupled with loneliness, social isolation leads to increased mortality, and potential for psychiatric issues like stress, anxiety, and trauma. Data from the EU suggests that half of COVID-19 deaths in Italy, Spain, France, Ireland, and Belgium have happened in senior living centers while deaths in the US total over 3600 in senior living centers. How do we protect the elderly from COVID-19 using spatial and technology design infrastructure while maintaining healthy levels of social interaction that enable them to promulgate a strong immunity to fight diseases? How do we promote socialization during times of forced confinement through technology design in populations less familiar with the use of complex digital systems?

OUT-going is a remote study to investigate the factors and patterns that impact older adults' sense of autonomy in socially isolated environments, with the goal of developing a digital interior intervention to improve their autonomy by having them engage in social activities and stay connected with their family and friends. Understanding older adults' needs for social connectedness and psychological factors that directly impacts their autonomy is important to their survival right now. We propose a mixed methods research study to collect data from senior home residents, with an already established partnership with Peabody Homes, which will allow us immediate start of the project. We will collect qualitative data such as degree of isolation, autonomy, stress level, and quantitative data like total time spent on communication and creative activities. In order to reach out to older adults in isolation we will conduct survey by mail, provide journals with daily challenge activities, and interview them with routine phone calls.

Using this data, we design a virtual window for promoting social presence and interaction amongst elderly populations isolated for disease prevention that enhances their sense of autonomy. The system will enable older adults to connect with friends and family by participating in connected creative activities like collaborative painting, dancing, being digitally present in family-related events like dinner time, join activities for physical and mental health, and engage in pro-health measures using positive routines. The environmental intervention employs a digital screen or flat-TV to emulate a real window in their rooms using a gesture-detecting camera that allows real-time collaborative activities with virtual feedback.

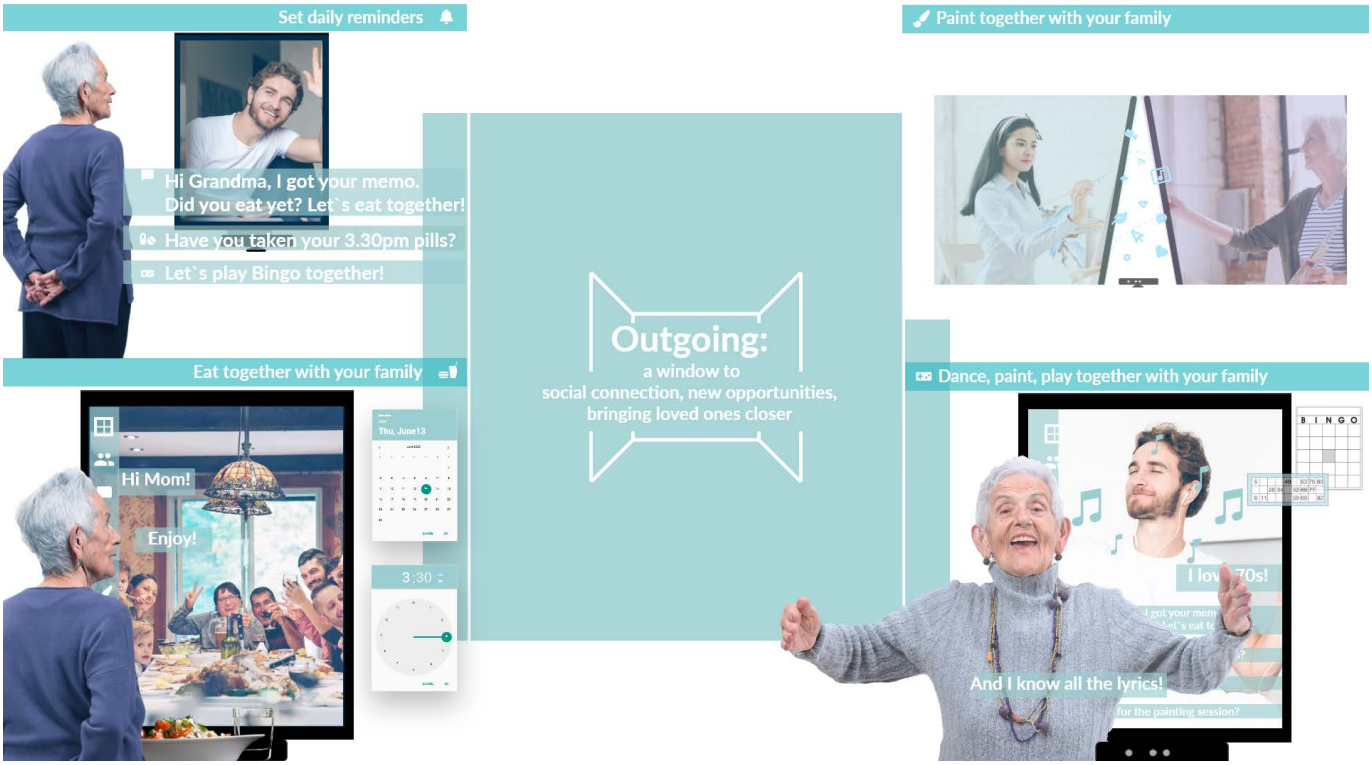
Dr. Kim is a designer specializing in elderly autonomy, working extensively with senior homes. Dr. LC is a neuroscientist and technologist working on post-traumatic stress and immersive technologies for coping with stress. Dr. Ramdin is a professor of nursing working in the field with COVID-19 sufferers.

Intellectual Merit: Engagement in social activities is found to be most effective at promoting a sense of autonomy for senior population, especially when situated in common contexts and goals. Instead of video conferencing involving disconnected scenes, the more socially present activities shared by the remote family member and the older adult undergoing common activities like eating, art co-creation, dancing, or gaming together. How they routinely collaborate informs us on how social connection is fundamentally deeper when coupled with interaction rather than just face to face chat. Understanding how these telepresences affect elderly well-being enables us to promote healthy living despite physical isolation.

Maintaining essential healthcare activities are critical to survival in physical isolation. Physical exercise can be undertaken by prompting the older adult to move in space by watching their own avatar on the screen as sensed by the depth image, so that they have to move their joints in the skeleton rendition to satisfy movements in gamefied space. Reminders of hand-washing, social distancing, and taking of medication can also be incorporated into the routine, so that the long days of isolation can be broken down into manageable activity units with minimal investment in technological learning. The system can monitor the activities (like co-painting or dancing) of the older adults and recognize any sign that needs the attention of the care provider. This provides a way to nudge older adults to pro-social behaviors connected by technology using an environmental metaphor (window) that literally open up their homes.

Broader Impacts: The system will be created to alleviate the isolation of older adults during the COVID pandemic, but in the long run it can be used for anyone undergoing physical isolation or quarantine to mitigate effects of social confinement, or undergoing long distance communication. Medical workers, staff, and psychologists can also use the safeguarding infrastructure to monitor well-being from distance.

Understanding how to shape interactions and nudge behaviors toward social connectedness and creativity/autonomy in digital systems for elderly adults can have impact in general technologies for social good for all populations, helping to inform what interactions and immersive methods provide affordances to help anxiety sufferers, hospitalized patients, and those working from home deal with physical isolation.



prototype and testing video: https://youtu.be/Gpz1HMqlIPU

prelinary digital prototype: https://www.figma.com/proto/245IPNKWHsjDLgd1NN6ACN/GlassWindow?node-id=13%3A10&scaling=scale-down