

ABLE ALLEY

Gesture Based Bowling Game for Seniors

THE ABLE PLATFORM

The ABLE platform focuses on creating social experiences suitable for seniors. ABLE is currently developing a wearable sensor based audio visual interactive experience that responds to users' movements. ABLE aims to assist older adults, as they age, to stay mobile, active, and engaged with community and the people they love. [6]. Previous feedback from ABLE's sensor-driven experience shows seniors do not particularly enjoy engaging in activities with absolutely no goal or storyline. This exposes the successes of gamified experiences with seniors and creates an opportunity to leverage this to improve overall health.

 ABLE Project has existing connections with AMICA (senior residence) for creating a platform that encourages social interaction as well as physical wellbeing. That we will be...

BACKGROUND

The problems and concerns of the elderly are quite substantial to the Canadian economy and job markets. The elderly population needs to be able to exercise and stay active regularly in order to maintain their mobility. Social isolation has been proven to lead to reduced health [3] such as lack of mobility which can increase risk of slips/falls..

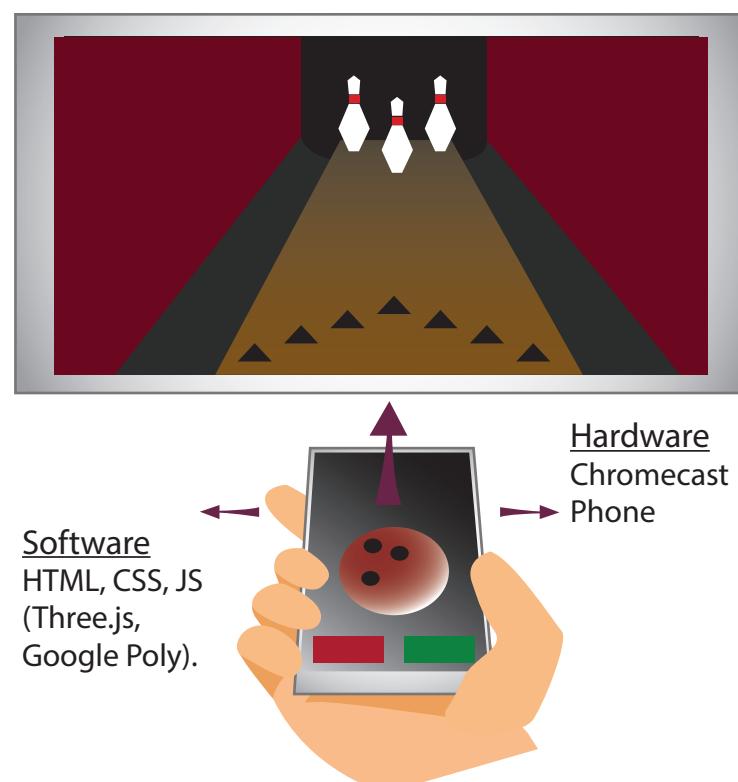
- It reportedly costs the government 2 billion dollars every year [2] just for healthcare associated with falls and slips.
- Loss of mobility (resulting in falling/slipping) is so frequently occurring that in just one year, 1 in 3 Canadian seniors above the age of 65 will likely fall at least once [2].

REFERENCES

1. AMIC, and Asia Information Poor to Information Rich. "AMIC 8th Annual Conference : Asia Information Poor to Information Rich - Strategies for the 21st Century, 1-3 July 1999, Chennai : [Contents]" DR-NTU HOME, 1 Jan. 1999, drntu.edu.sg/handle/10220/1821.
2. Public Health Agency of Canada. "Seniors' Falls in Canada: Second Report." Canada.ca, Innovation, Science and Economic Development Canada, 10 Apr. 2014, www.canada.ca/en/public-health/services/health-promotion/ag-ing-seniors/publications/publications-general-public/seniors-falls-canada-second-report.html.
3. Singer, Clifford. "Health Effects of Social Isolation and Loneliness." Aging Life Care Association, Journal of Aging Life Care, Spring 2018, www.agilifecarejournal.org/health-effects-of-social-isolation-and-loneliness/.
4. Glänfjord, Fredrik, et al. "Elderly People's Perceptions of Using Wii Sports Bowling – A Qualitative Study." Taylor and Francis Online, www.tandfonline.com/doi/full/10.1080/11038128.2016.1267259.
5. Lane, Andrew M., and Haydn Jarrett. "Mood Changes Following Golf Among Senior Recreational Players." US National Library of Medicine - National Institutes of Health, 1 Mar. 2015, www.ncbi.nlm.nih.gov.libaccess.lib.mcmaster.ca/pmc/articles/PMC3880083/.
6. Gardner, Paula, et al. "ABLE: An Arts-Based, Interactive Physical Therapy Platform for Seniors with Dementia and Frailty." HCI International 2018 – Posters Extended Abstracts Communications in Computer and Information Science, 2018, pp. 140–148, doi:10.1007/978-3-319-92279-9_19.
8. Ingemito, Teresa, et al. "The Effects of Wii Bowling on Balance in Older Adults." Physical Medicine and Rehabilitation Research, vol. 1, no. 2, 2016, doi:10.15761/pmrr.1000108.

OBJECTIVE

ABLE Alley intends on creating a senior-friendly gaming experience that promotes health in a social environment. The intention is to create social engagement that can reduce isolation amongst seniors.



IMPLEMENTATION

The UI will feature simple buttons to alter game state (start, stop) but majority of gameplay will be gesture based.

The player will use a wifi enabled touchscreen device to control the game with motion. This device will provide simple feedback by displaying the active player and their bowling ball while the TV will display the game (bowling lane, score).

IMPACT

ABLE Alley can improve the standard of living for the elderly by decreasing their isolation which can benefit their health substantially[1]. It is expected that improving the isolation of the elderly can save on the vast healthcare costs[3] associated with its side effects. The impact of this study can be better analysed with user studies (interview and observational data) conducted on the prototype or final product.

DETERMINING THE EXPERIENCE

Tennis, golfing and bowling are all suitable activities for maintaining good health among seniors [1][4] while providing a traditional gaming experience that is familiar to elderly.

			
Physical Impact			
Difficulty			
Teams			

Bowling integrates a social environment that is ideal for the direction of ABLE Alley while golf has proven to increase negative feelings in the elderly [5]. Tennis proposes difficulties with turn-based gameplay which is ideal for the solution because active and turn based video games increase activity and socialization [1].

INVESTIGATING TECHNOLOGIES

Considerations for physical ability are all together more complex because humans (and more so, elderly) come in a plethora of shapes and sizes with even more varying abilities. The elderly specifically bring more complications as they are often aided with peripherals such as wheelchairs, walkers, etc. Technologies focusing on upper body mobility are necessary for the implementation.

 Nintendo Wii	The Wii does not offer development coverage to create and ship production quality applications and cannot be adopted by AMICA (or similar residence).
 Computer Vision	Considerations for physical ability introduce difficulties for training a model to recognize types of assisted walking devices/peripherals.
 Google Chromecast	Requires the least setup but consistent WiFi. Chrome browser supports sensing upper body movements through internet-enabled devices.

Sensor experiences are not considered for this project because the ABLE Platform is in progress developing with sensors and curating sensor data with similar objectives.