# Microsoft Research

# Queens University Belfast

# Microsoft AGE: Adapted Games for Elderly

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XBOX 360

**KINECT** for XBOX 360.

## Aims of the Project

This project aims to evaluate new ways of motivating older adults to move and perform exercises by encouraging them to play computer games that are fun.

This project also aims to design games that adapts to individual player's affordances, where the level of difficulty of each level in the game will be able to accommodate to individuals user's physical abilities. The project aims to form a basis of principles for designing interactive movement based games for older adults.

## Research Questions

✓ How can new technologies Like Microsoft Kinect be used as a rehabilitation tool and to motivate older adult to move and exercise.

✓ How can a user with less movement capabilities uses his body to control a system efficiently. And how to make the system adapts to different users  physical capabilities.

✓ How can perception guide actions in a movement based  games.

✓ What are the most important elements of the games that make such games are fun for older adults.

## Methodology

The project is planned to be undertaken in three stages, Design, Playability and Mobility Evaluation.

## Stage One  Design

The design needs to include simulating game visuals, rewarding audio, adapted levels of progress, and real movement control. The project focuses on how to design games that adapts to individual player's affordances, where the level of difficulty of each level in the game will be able to accommodate to individuals user's physical abilities. The design has to be inclusive, maximizing the number of people for whom these games are 'playable' and 'enjoyable'.

This stage will also explore some usability issues, and explore different older adults' mental models about how to interact with Kinect, also their different interests, tastes, and preferences. Findings from this stage will be used to understand how we can exploit the positive sides of Kinect technology to create Adapted Games for the Elderly that use dynamic sensory environment to guide the user's actions.

## Stage Two: The Playability of the Games

This stage starts as soon as first prototypes are finished, tools such as Adobe Flash CS5.5, and Unity 3D are used to develop the games. The games will be tested with a group of older adults. The participants will have to play the games for a certain period of time. The researcher will be observing and video recording how the older adults are playing the games. Another usability questionnaire will be used at the end of the testing period to evaluate the playability of the games.

## Stage Three: Evaluation of Balance and Mobility Improvement.

Third part of the project will focus on whether NUI games encourage mobility and improve balance control in older adults.

A scale to measure the balance and mobility such as Berg Balance Scale and Falls Efficacy Scale will be used before and after playing the games.

Inside the games, some data such as response time, speed of movements, game scores, date and time will be recorded for further analysis.
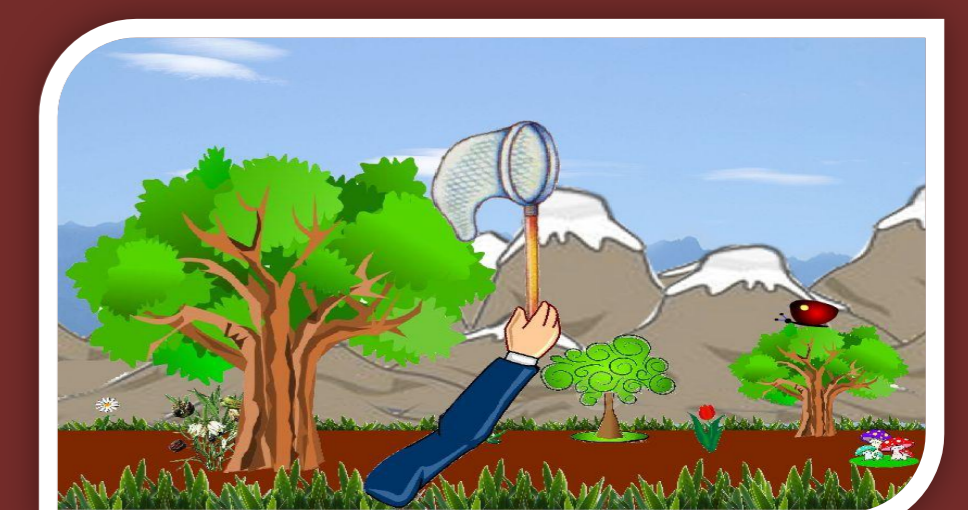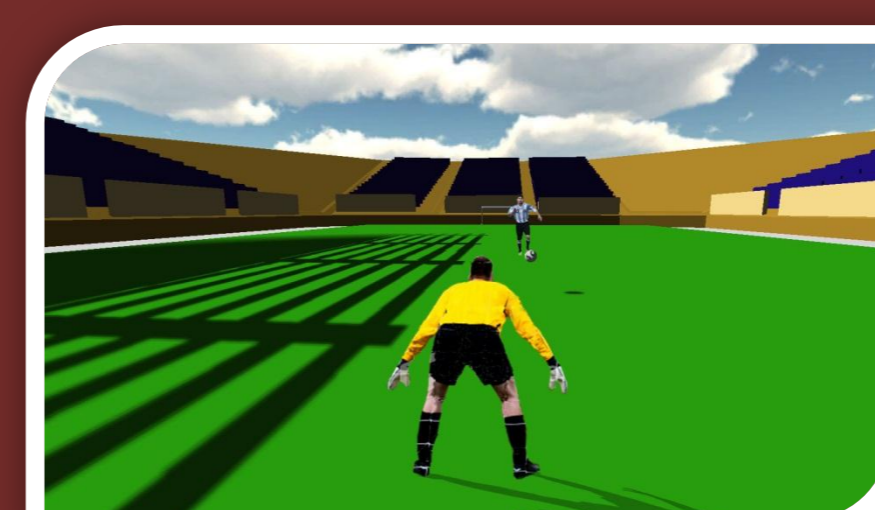
Game prototypes that are being developed