Using the Kinect to Encourage Older Adults to Exercise: A Prototype

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This project is exploring the basic requirements and understanding necessary for implementing an exercise game for older adults using the Microsoft Kinect.

Motivation

- Physical activity is important to maintain good health (World Health Organization, 2010).
- Older adults are motivated to exercise by peers and doctors (Dishman, *Southern Medical Journal*, 1994).
- Motivation to exercise starts to decline after a period of 16 weeks (Resnick, *Educational Gerontology*, 2001).
- Nature gesture-based inputs like the Wii are found to be much easier to use than traditional input methods (Becker, *ACM TOCHI*, 2004).

★ **Hypothesis**: the Kinect may be even better.

Design

User-centered design methodology was used to develop the game prototype.

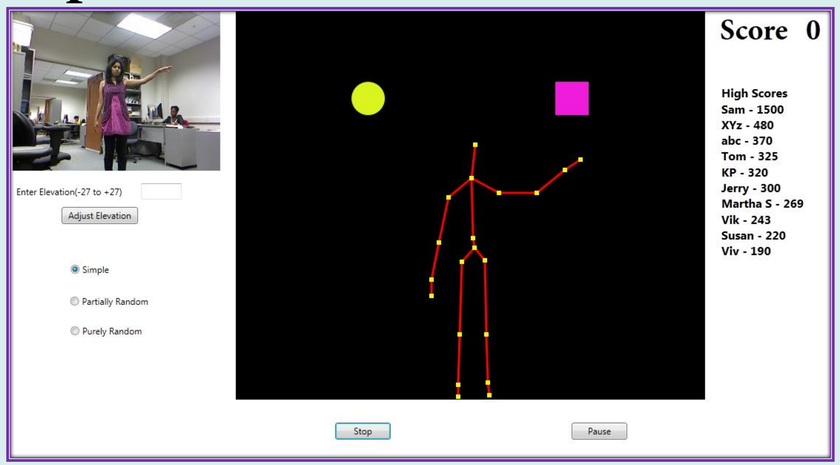
Discussion with Field Expert
Suggested arm raises as a suitable exercise for implementation.

Focus Group with Older Adults
Participants: 5 (3 female), ages 65 to 90
Game design ideas and considerations were developed.

Findings

- Avoid having arms raised constantly for extended periods of time.
- Incorporate the stick figure with the skeletal tracker.
- Keep score and display it in a large font.

Implementation



Screenshot of the Kinect game prototype.

Game prototype was developed in C# using Kinect for Windows SDK v 1.0 beta 2.

Game (try the QR Code for video demo!)

- Shapes (circle and square) appear at 5 levels, from arm-at-sides to arm-raised-vertical.
- Touch the circle (+ score).
- Avoid the square (- score).
- Variable scoring depending on level.

Preliminary Interaction Evaluation

Participants: 5 (2 female), ages 20 to 30

- The stick figure was fun to watch.
- The current score wasn't easily noticeable.
- Good motivation to continue game play.
- Tendency to set a personal high score goal.

Continuing Design

Based upon the preliminary evaluation and the focus group, new features were added to the game to improve its interactivity.

Feedback from Field Expert

- Good from perspective of exercise, but how good it is at motivating older adults to exercise is to be tested.
- Suggested adding a variety of games to make it more interesting and challenging.

Focus Group with Older Adults

Participants: 2(2 female), ages 65 to 90

- Positive feedback about the game.
- Showed motivation to continue game play.
- Wanted their name on the high score list.
- Perceived as comfortable and safe to use.

Future Design Considerations

- Interactive Features
- Graphics and Visualizations
- Game Complexity
- Social and Motivational Features
- Play-testing with Older Adults

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