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

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).
- 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
- **Score 0**
- **High Score**
  - *Trace*: 1930
  - *Arm*: 440
  - *Face*: 370
  - *Arm*: 320
  - *Arm*: 390
  - *Arm*: 390
  - *Arm*: 390
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- **Game Settings**
  - *Shape*: Circle
  - *Tone*: 500 ms
  - *Score*: 500

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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

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

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