



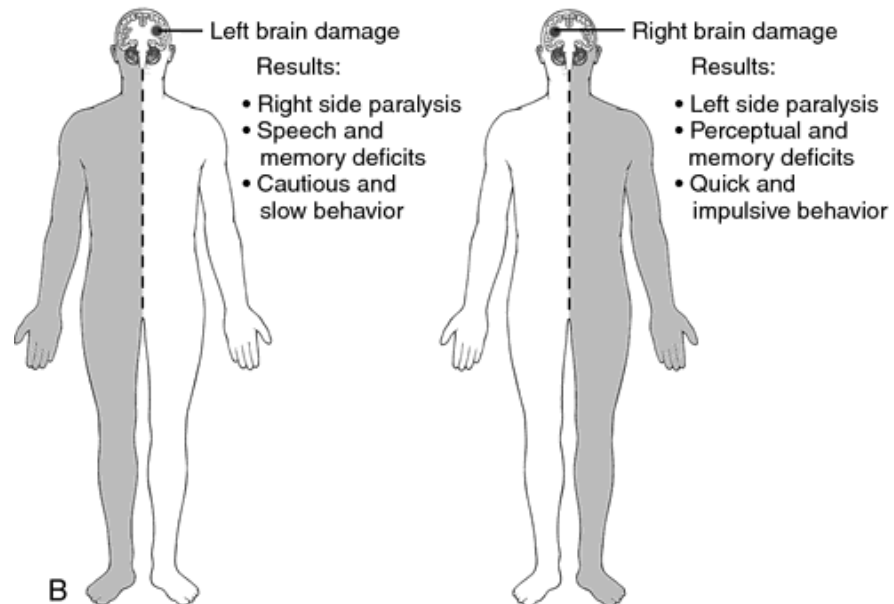
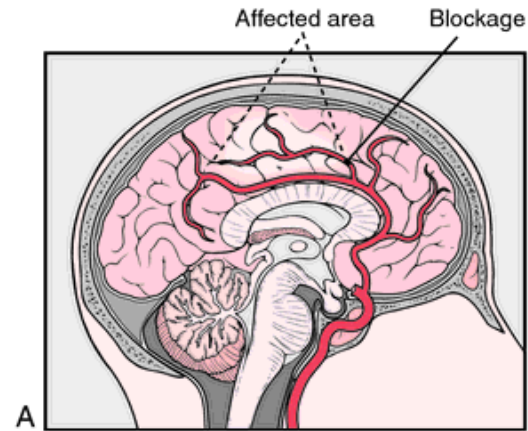
Microsoft Surface for Stroke Rehabilitation

Lilian de Greef, Andy Kearney, Kiley Sobel, and Russell Transue

Advisor: Professor Z Sweedyk

Liaison: Dr. Cati Boulanger

Stroke



Stroke Rehabilitation

- ▶ Speech therapy
- ▶ Occupational therapy
- ▶ Physical therapy



Microsoft Surface 1.0

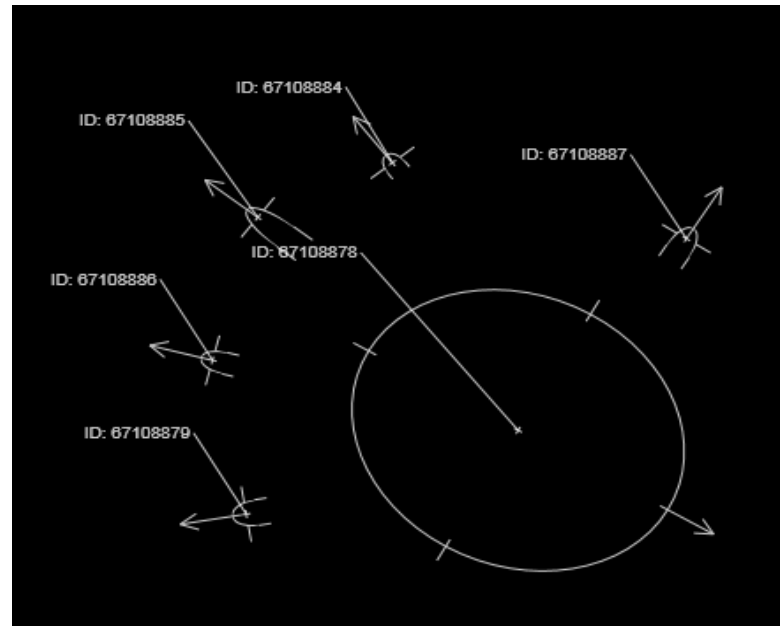
Large multi-touch surface

- ▶ Touching
- ▶ Dragging
- ▶ Scaling
- ▶ Turning
- ▶ Flicking



Surface's Potential as a Rehabilitative Tool

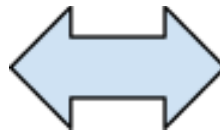
- ▶ Finger Recognition
- ▶ Blob Recognition
- ▶ Augmented Objects



Problem Statement

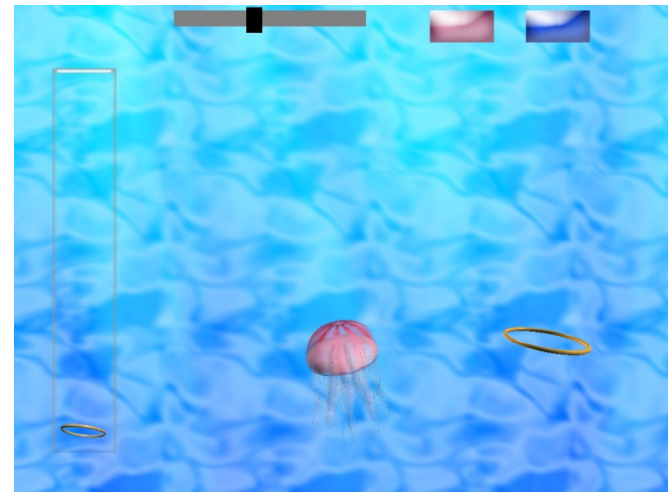
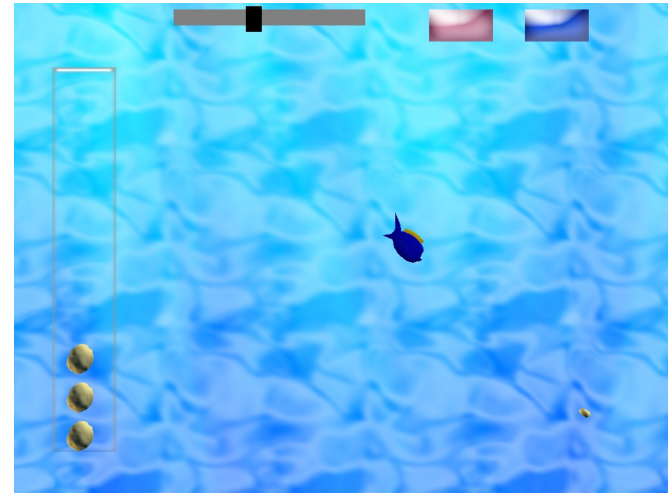
Design and develop a system using the Microsoft Surface that:

- Assesses the motor skills of post-stroke patients
- Works as a rehabilitation tool
- Motivates patients to engage in the rehabilitation process

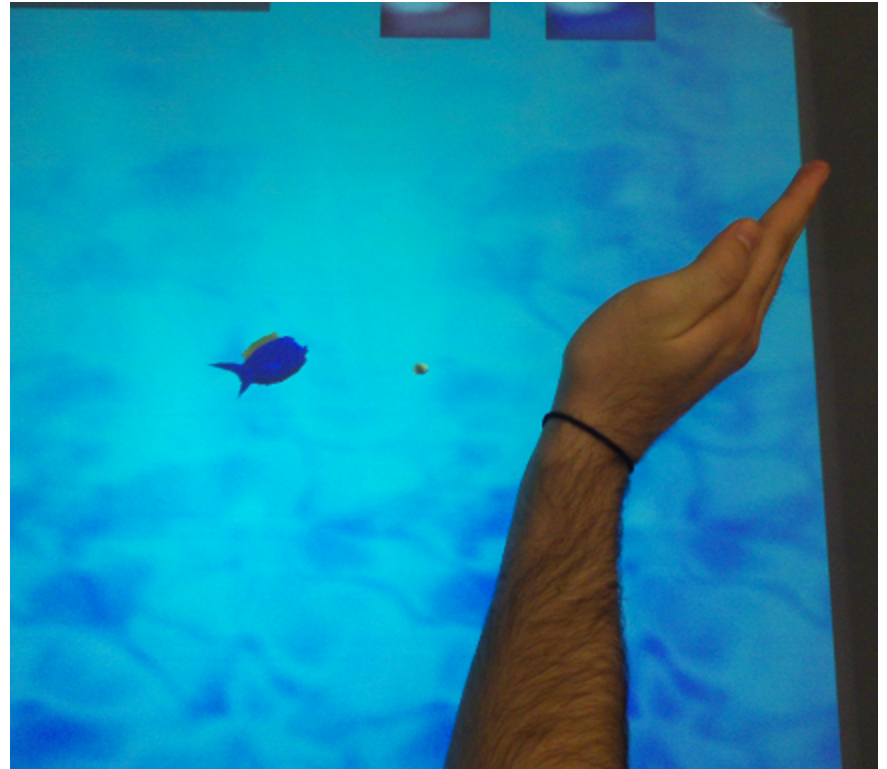
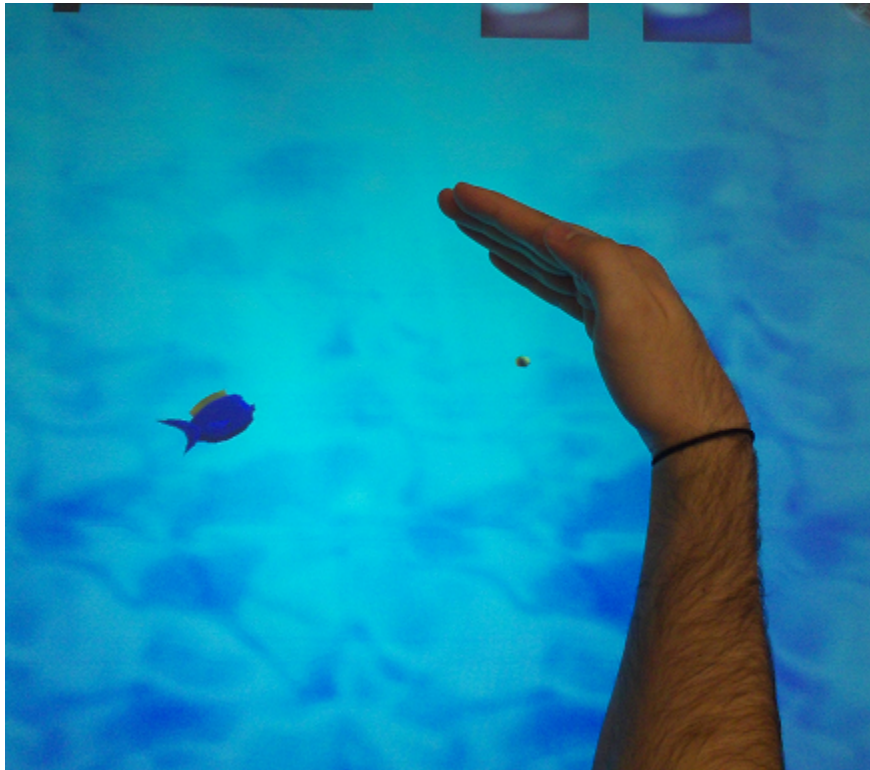


Our Game Prototype

- ▶ Propel sea creatures toward goals
- ▶ Gestures are rehabilitative exercises
- ▶ Motivational, no negative feedback



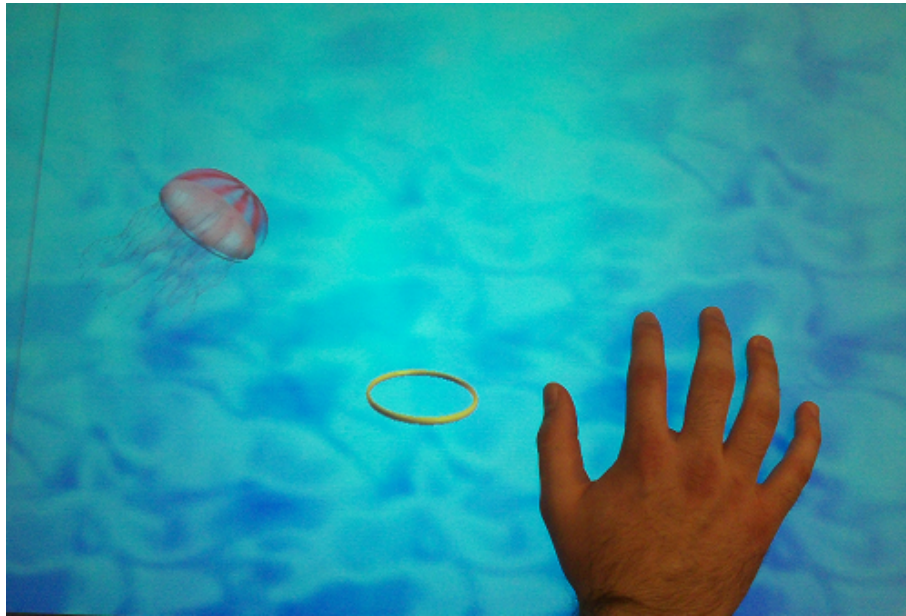
Fish Gesture



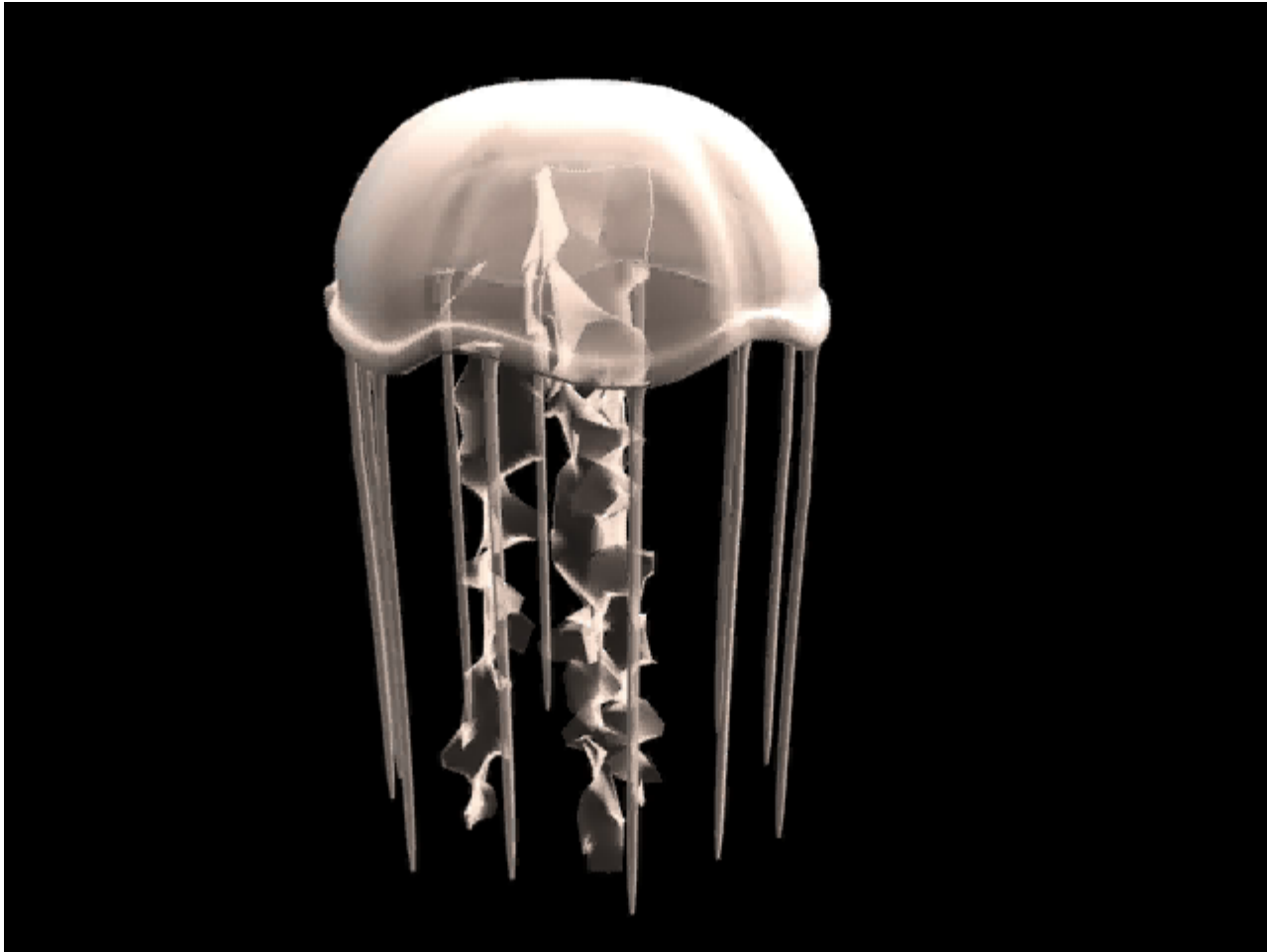
Fish



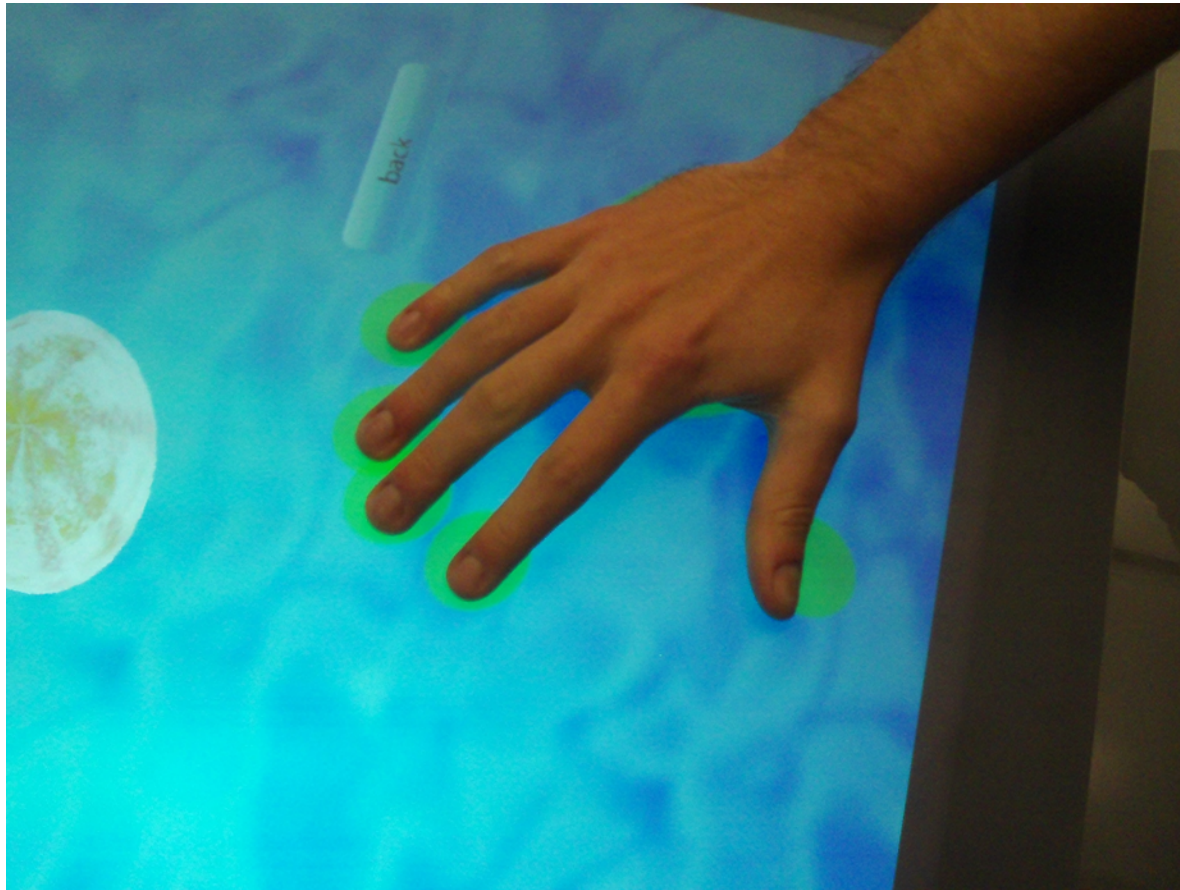
Jellyfish Gesture



Jellyfish



Gesture Feedback

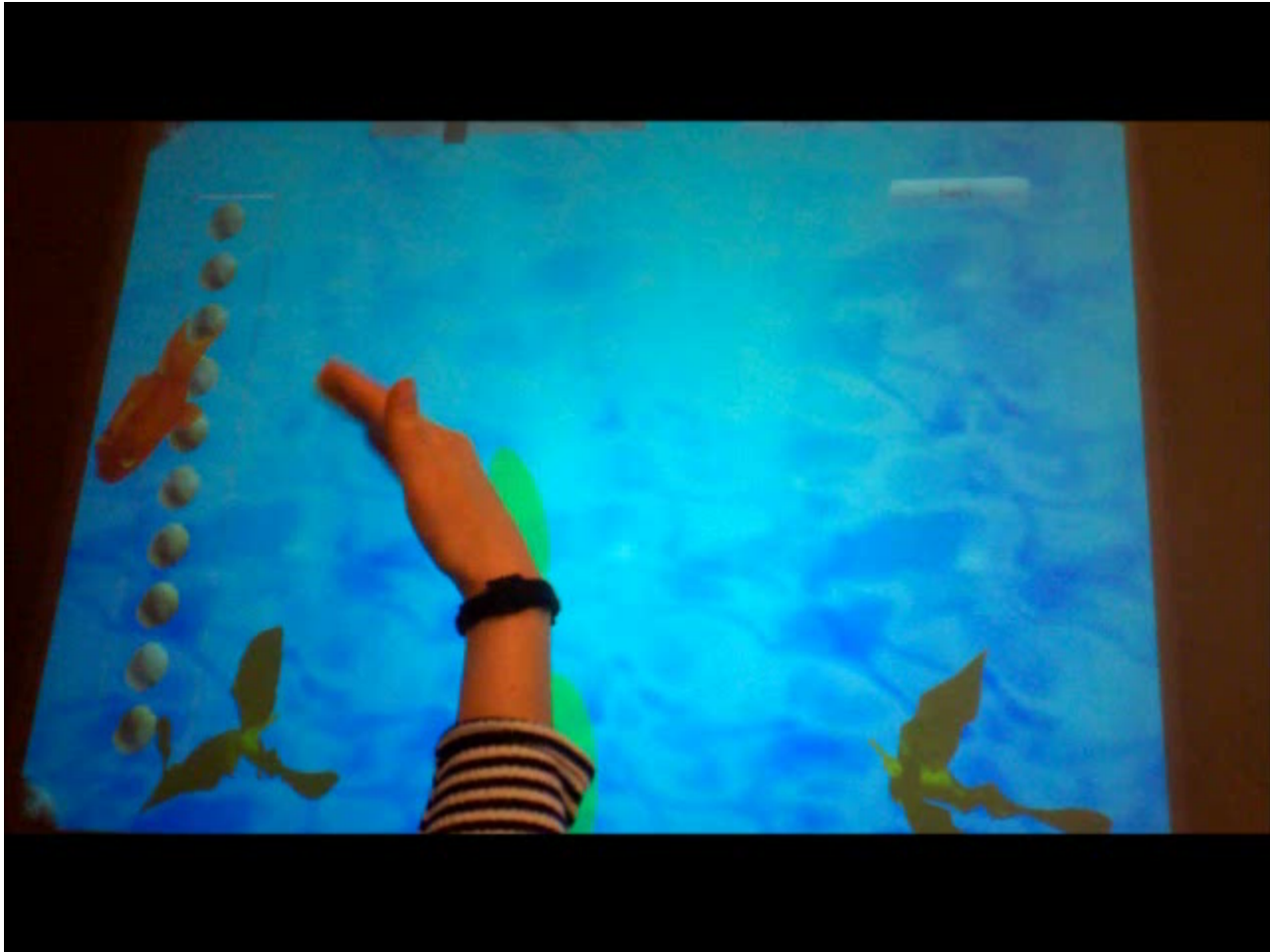


Saving

- ▶ Keep track of data to assess progress
- ▶ Quantify measurements so they aren't subjective observations



Demo



Future Game Features

- Trophies and other rewards
- Creating a fish friend through creature enhancement



Future Game Features

- More gestures/new creatures
- Scalability
- Augmented objects
- Progress visualization
- Full routine mode

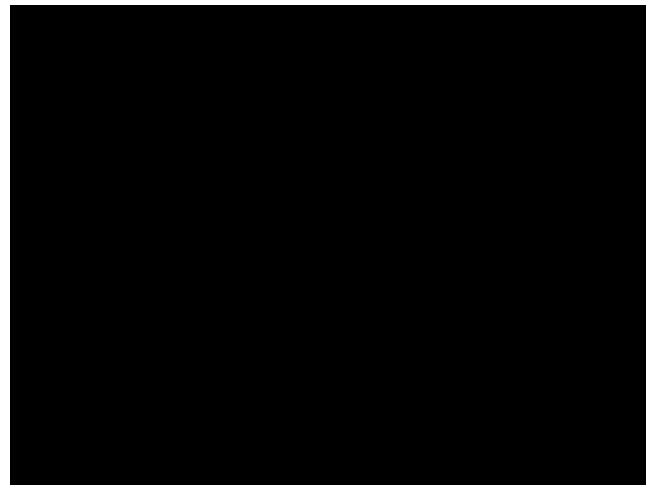


User Studies



User Study #1

- ▶ Interviewed 6 patients
- ▶ Results: importance of scalability for motivation
- ▶ They performed both gestures on the Surface



User Study #2

- ▶ Scheduled for April 23rd
- ▶ Users interact with game for 10 minutes/day for 5 days
- ▶ Test the reliability of the measurements and observe patient response



Questions?

