Using VR in Rehab

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Traditional Rehab Evaluations and Treatments

- Lack real-life complexity and dynamic nature
  - Tests fail to detect impairments
  - Treatments limited in ability to target complex functions
- Boring and repetitive

What is Virtual Reality?

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Virtual Reality

- Computer generated simulation of image or environment
- User can interact with and manipulate objects to perform actions

Virtual Reality

Immersive

Non-Immersive

USC Institute for Creative Technologies

Impact of VR on Rehab

- Greater ecological validity
  - Tests better able to distinguish patient groups from healthy controls
  - Treatments require patients to practice real-life skills
- Fun, motivating, gameified
  - Maximal effort
  - Improved adherence
  - Greater efficacy*

Core Principles in Development

- Constant communication between clinical team and developers
- Iterative procedures, flexible, agile

Wonderkin Wonderworks Attention Treatment

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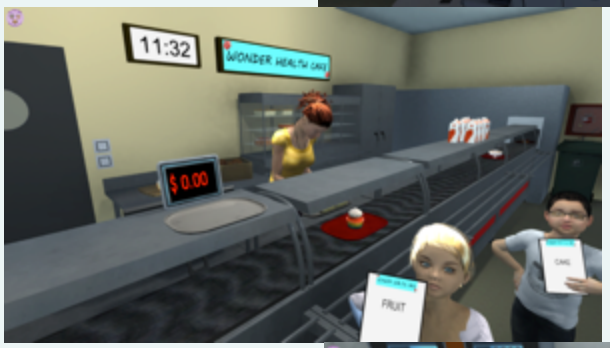
Traditional Computer Interface

Task Switching

Module 1

Module 2



Module 5

Module 6

Multitasking

Module 3

Module 4

Module 7

Module 8

Island Quest Balance Treatment

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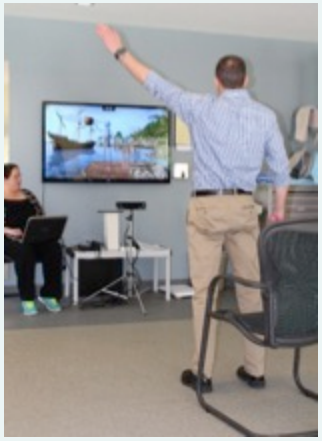
Kinect-based System

- A sensor tracks a person's body in 3D space and sends information to PC

Cardiovascular Warm-up	Somatosensory	Visual-oculomotor
		
		
		

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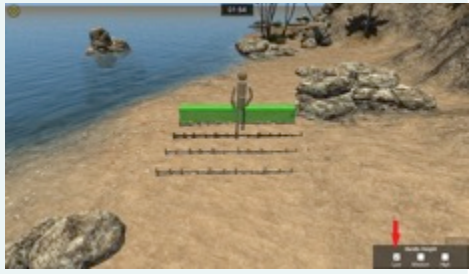
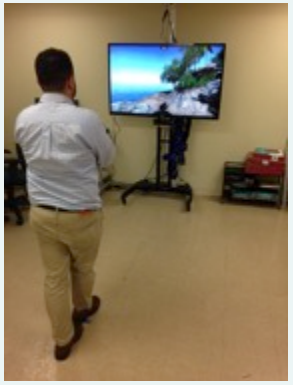
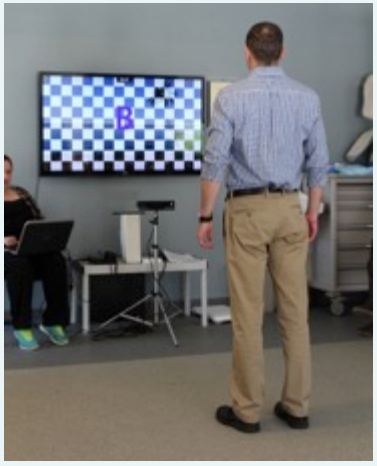
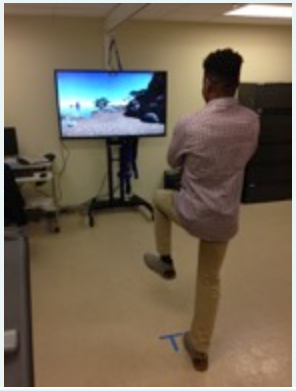
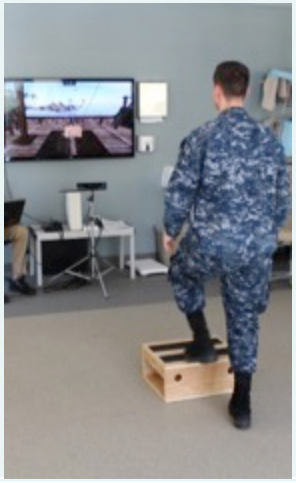
Vestibular	Multisensory: Static Standing Balance	Multisensory: Dynamic Standing Balance	Multisensory: Walking

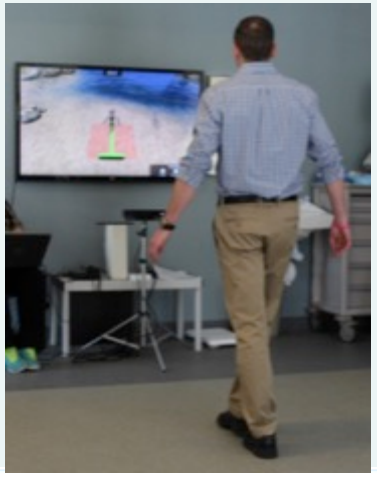












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Challenges and Future Directions

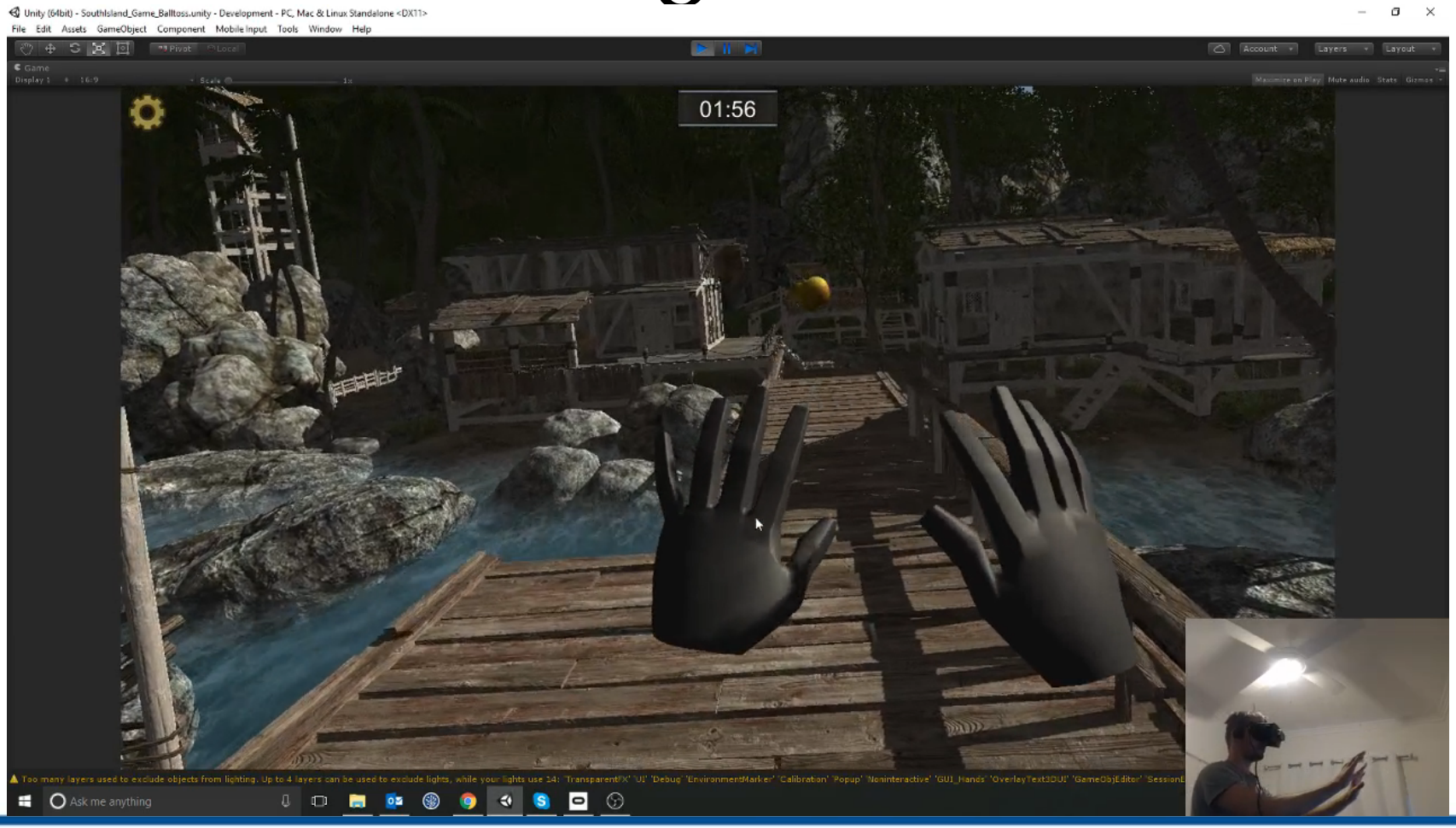
Challenges

- Validating efficacy
- Payor reimbursement
- Clinician buy-in

Future Directions with Current Projects

- Wonderkin Wonderworks
  - Large-scale efficacy trial
  - Commercialization
- Island Quest
  - Complete RCT
  - Implement HMD

Island Quest using HMD



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Future Projects

- Spatial retraining
- Social cognition

Contributors

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