TouchView:
Assistive Device for MPS Children

Jung Wook Park
jungwook@ufl.edu
Mobile and Pervasive Computing Laboratory
University of Florida

UF | UNIVERSITY of FLORIDA
The Foundation for The Gator Nation

Agenda

- Introduction

- Behavior Characteristics of MPS Children

- Cognitive Enhancement

- TouchView: Tangible Controller

- Discussion

- Further Study

- Demo

Introduction

- Emerging Opportunity and Challenges

  - Pervasive computing offers new opportunities to improve the quality of life.

  - Human-computer interaction could be used as technology to augment our physical capabilities.

  - How can we utilize the benefits to solve problems in real-world applications?

Introduction

- Problems in real-world

  - Developmental disabilities require burdening care on the part of the parents.

  - The parents have to be dedicated 24/7 to support and sustain their child's life.

- Needs in real-world

  - The parents want to know some of their child's desires to support their life.

  - If the children can make decisions based on their demand, it could be an ultimate goal in their life.

Behavior Characteristics of MPS Children

- MPS(Mucopolysaccharidoses)

  - MPS is a rare hereditary disease caused by the body's inability to produce specific enzymes.

  - MPS III also known as Sanfilippo disorder is one of the rarest types of MPS present in only 1 in 70,000 births.

  - The abilities to learn, speak and communicate are lost.

  - To date, there is no cure.

Behavior Characteristics of MPS Children
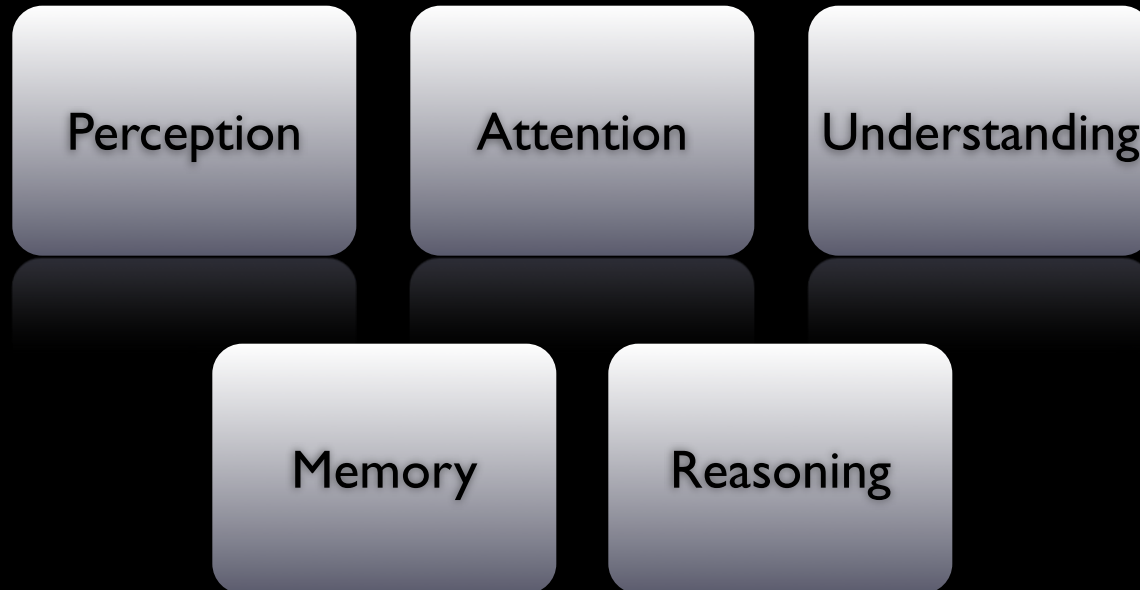
- MPS(Mucopolysaccharidoses)

Behavior Characteristics of MPS Children

- Characteristics

  - MPS children are not able to represent their demands through speech.

  - The only language is abnormal activities, such as shacking, biting and touching.

Cognitive Enhancement

- The process of cognition

Perception	Attention	Understanding

Memory	Reasoning

TouchView: Tangible Controller

- The Controller

  - Perception: Actual size/shape slots

  - Attention: Actual DVD cover pages

  - Understanding: Play the selected movie

  - Memory and reasoning: Watch the movie and make a link between their demand and image representation

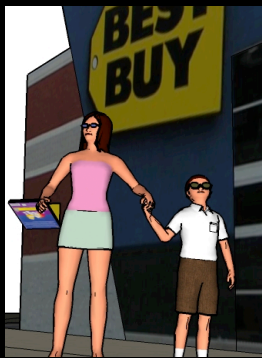# Discussion

- Discussion with a volunteer family

  - The formation of new requirements for a more ubiquitous and distributed concept.

  - Ignore multiple touches.

  - Electric components and devices have to be placed away from the edges of the DVD case.

  - Make a multimodal sensing device with a pressure sensor and an accelerometer to improve MPS children's usability

Further Study

- Design and experiment

  - Re-designing our prototype by making each DVD case a stand alone, single-slot TouchView.

DEMO