TouchView: Assistive Device for MPS Children

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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 shaking, 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.