

Brain Computer Interfaces and ASD Treatment

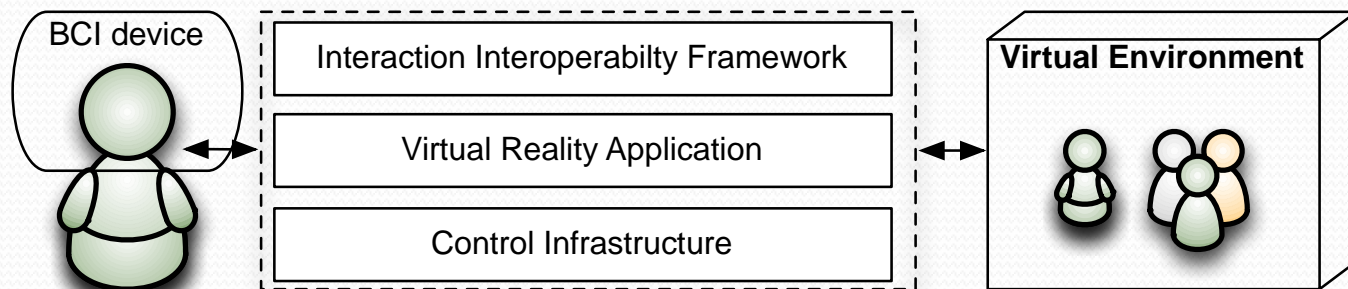
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Brain Computer Interfaces

- People with ASD often exhibit EEG activity that is atypical (compared to general population).
- High-end devices such as fMRI and high performance digital EEG could be used to detect such conditions.
- The emergence of affordable, lightweight, portable brain computer interface (BCI) devices provides some exciting opportunities:
 - Create affordable and portable intervention tools.
 - Design customizable user interfaces.
 - Apply findings from high end devices.

Ongoing Research

- A user study to investigate the practical use of BCIs for both older adults and young learners.
- Development of the control infrastructure that provides an abstraction of the application tasks and enables easy integration with adaptive user interfaces.
- Exploration of general principles behind the use of BCI devices in user interfaces.



CAR Research Ideas

- Explore how to effectively use BCI devices to help with the social and health aspects of ASD.
- Determine what are the additional technologies (immersive virtual reality, 3D interfaces, notification systems, mobile devices)?
- Develop a testbed framework to support fast prototyping and testing of intervention tools and applications.
- Design testing and usability guidelines for intervention tools and applications.

Current Relationships and Resources

- Center for Human-Computer Interaction (CHCI):
 - Ten 145 square foot project rooms.
 - One 280 square foot general HCI laboratory.
 - 2,330 square foot shared laboratory space incorporating Virtual and Augmented Reality, Aware, Gigapixel Display and 3D Interaction Laboratories.
- ICTAS Funding:
 - Collaboration with Virginia Bioinformatics Institute (Joe Gabbard), Center for Gerontology (Karen Roberto) and Psychology Department (Kirby Deater-Deckard).
- Current Collaborations:
 - Drs. Susan White and John Richey (Psychology) – collaboration on BCI and VR based treatment of ASD.

Collaborations and Resources Needed

- Promote collaboration between researchers from technological, social and health and other areas.
- Identify and help provide access to scarce/expensive resources (fMRI, CAVE, lumenHAUS).
- Identify funding opportunities.