Augmentative and Alternative Communication Technology

Overview
Alternative and augmentative communication (AAC) technology, helps aid persons with physical disabilities including a lack of functional speech. At present, many AAC technologies rely upon automatic scanning for persons who do not have reliable motor functions, to manipulate a device. Unfortunately, scanning challenges persons with impaired or underdeveloped cognition, such as patients with cognitive disabilities, young children, or patients with altered levels of consciousness. A software technology that teaches automatic scanning in a motivational and engaging manner would greatly benefit these populations.

Objectives
Our sponsor identified high priority features of the software as our project objectives.

High Priority Features of Software
- Ability for Parent or clinician upload personal video or gif
- The scanning will occur automatically
- A still image of the video will be obscured at the top
  - One piece of the still image will be shown among unrelated pieces.
  - The app will scan through the pieces and move the piece forward to communicate the potential for selection.
  - If the user selection is correct, that piece will be uncovered in the still image. Scanning will continue until the picture is completely revealed.
  - When the picture is completely revealed, it will animate to provide instructional feedback to the user.

Approach
- Weekly sponsor meetings ensured appropriate communication of objectives and adequate progress towards those goals.
- SQLite and Django were previously used for an AAC project, so we used these to build upon that previous work.
- Features were broken up into tasks that were allocated to team members across four Agile sprints.
- Testing was performed for the creation of the jigsaw piece.
- Penn State server deployment was completed to enable continued use of the software by RERC and Invotek sponsors.

Outcomes
Our software expands the previous technology’s functionality and instructional potential for cognitively impaired users.
- Pieces initially obscured
- Animation of videos upon completion
- Jigsaw pieces
- Automated removal of users after inactivity period
- Penn State server deployment without additional costs