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Vision Statement

Project Title: CueMeIn
Company: LogMeIn
Team Name: Runtime Terror
Team Lead: Mason Corey
Team Scribe: Javier Jimenez

Project Summary:

Overview

      Nearly 1 in 5 people in the United States live with some sort of disability. Certain disabilities - specifically intellectual or developmental ones - may cause limitations in cognitive functioning and abilities. As the world shifts towards technologization, communication is made even more challenging for such individuals when interacting through video chat. There are varying disabilities that would benefit from a software that facilitates online communication - for example, people with autism, fragile x syndrome, or other developmental disabilities may find it difficult to analyze emotions or social cues over a video call.

      This project focuses on helping the non-profit Special Olympics by creating a tool that will aid disabled people by improving the way they communicate virtually. Thus, having a platform that focuses on catering to people's disabilities can help facilitate more effective communication. We plan to use different styles of input data - such as video and audio - and processing those in conjunction with machine learning to achieve our goal.

Why is this Important?

- People with disabilities can have a harder time communicating virtually.
- There are not enough tools to help people who struggle to communicate in a virtual platform.
- During unprecedented times such as the current COVID pandemic, many of our modes of communication are shifting toward virtual communication.
- Will help people with social interactions and increase their social skills.

Previous Tools/Technologies

- SayWAT - Wearable technology that can assist and deliver feedback to individuals during face-to-face conversations to help with miscommunication issues
- iOS Applications (Learn With Rufus) - Assists children/adults with autism to understand and learn different emotions and helpful ways to portray them
- Affectiva SDK - AI Company focusing on emotional recognition through the use of facial recognition, facial feature extraction, and finally emotional classification

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Project Outcome/Goal:

- Create a virtual tool that will help disabled people communicate more efficiently and effectively via Zoom/video conferencing by catering to their disabilities

- We would like to create tools for people with varying disabilities. Firstly, we plan to read emotional states of people and display them on the screen for those with cognitive disabilities. We may also decide to implement other tools such as audio to text conversion for hearing impaired people, highlighting and increasing contrast of images for visually impaired people, and so on.

Solution Implementation Details (Technologies you will need):
- Video Processing - Object tracking, Action classification
- Audio/Text Processing - Automatic Speech Recognition, NLP
- Machine Learning - TensorFlow, Google Cloud ML Engine, Amazon ML, Python SKLearn/PyTorch/TensorFlow
- Video Conferencing Software - LogMeIn's Conferencing Software (GoToMeeting) and its APIs (we can grab video and audio from their interface, process it, and display emotions through a new API that we create accordingly).

Milestones and How to Achieve Them:
- Identify difficulties that people with disabilities face and adjust our project goal accordingly to tackle these specific issues
  - Conduct interviews with Special Olympic athletes
- Determine the specific technologies necessary to realize concrete solutions to these issues and decide which of these technologies we can practically implement
  - What are the components we need to implement audio to text conversion? Facial recognition? Image contrast?
  - Mentor recommendation and personal research
- Construct a plan on how to implement these technologies in a video conferencing setting
  - Viable plan by the end of first quarter
- Present a functioning prototype by the end of the second quarter that implements technologies and resources obtained in the first quarter.

Github Repo Link: https://github.com/themason2011/CS189A
Trello Link: https://trello.com/cs189a
Google Docs Link:
https://drive.google.com/drive/folders/1x7_dRbZJYQjnsbNsRPwsx3MhiEt3WP1M?usp=sharing