Project Summary

People who are deaf or hearing impaired have limited communication channels when there is no interpreter available. They must rely on either typing, using hand gestures that a hearing individual can understand. This at times may be frustrating and challenging. The proposed project tries to bridge the communication barrier by implementing an ASL to voice video chatting interface system. This project plans to use machine learning, computer vision, and video modification software to allow the targeted individuals the opportunity to have a conversation with someone who does not understand ASL, in real time. The equipment required for this project is the Microsoft Kinect sensor, video modification libraries, and ASL video libraries.

Intellectual Merit:

The intellectual merit of the proposed project will lie within the the recognition of gestures and machine learning. The recognition of gestures, specifically finger tracking has become increasingly popular and more researched. Many companies are integrating finger recognition into their products, such as video games and phones. As technology advances, devices will move away from the touch screen and begin to rely more on finger and voice recognition. This project will dive into tracking finger gesture libraries that already exist and will improve them as Chelsea and Elizabeth extend finger gesture technologies to recognize ASL. The translation of ASL hand gestures to text is a current problem without a published and accurate solution. Additionally, this project will involve machine learning, which is a current problem that will always have room for advancement as technology improves. Machine learning will be used as different users will have different sign styles and the software will need to learn when to accept a word and when to reject. Chelsea and Elizabeth will face a many challenges while implementing this project. The largest anticipated challenge will be distinguishing ASL from common hand gestures. Examples of common hand gestures is scratching a nose or moving a piece of hair from the cheek. Another anticipated problem the project may face will be the processing time and having the translations occur in real time. The more software implemented, the slower the translations. Given that voice detection software is already published, Chelsea and Elizabeth will also have to work to seamlessly integrate their software with the already existing programs so that the transitions are undetected.

Broader Impact:

The broader impact of this project is to improve social norms when it comes to communicating with individuals of the deaf or hearing impaired community. Currently, the targeted audience work harder to be understood by their hearing counterparts. What is proposed has the potential to be used on many platforms besides the Microsoft Kinect. The primary demographic of this project can use this software on their mobile devices and personal computers. The outcome of this project is the first step towards bridging the gap between people with a language barrier. This program can also be expanded to work with other sign language dialects across the world and be translated into many foreign languages.