Goal

For some forms of throat cancer, the necessary surgery will likely take away their voice, either temporarily or permanently. In addition, many patients, regardless of their condition, might need to be intubated, resulting in the ability to speak.

Innovation

Tools and Apps already exist that allow patients to vocalize their needs or ask questions. However, with new machine learning models, we can now clone a human's voice and let the AI speak on their behalf, in their voice. For this project, I created an IOS iPad app specifically for patient needs, but with the ability to pre-record their voice while still functioning, such that the app can mimic that same voice while being used.

Approach

This project consisted of two separate components. The first was to build an app that was easy to use but still had a wide range of utterances available. Perhaps more important, the app was designed to be in-house, and new combinations of commonly used phrases could be easily added without outsourcing it back to a 3rd party software developing company, thus saving time and money.

The second part of the project had me explore various ways of efficiently and accurately capturing the unique aspects of an individual's voice and having ML algorithms be responsive and fast enough to synthesize an utterance in that voice. The first I did achieve, although real-time synthesis is still a challenging problem, even for large tech giants like Google and Facebook.

Impact

The ability to continue speaking in one's voice should provide confidence and comfort to a patient who has undergone a traumatic event. Further still, since I developed the application in-house, we can offer the patient to continue to use the application even after discharge as ownership lies entirely with the hospital, not some 3rd party SaaS vendor.

Technologies Used