

# EE / CprE / SE 492 - sddec22-13

## Simultaneous Call Transmission

### Bi-Weekly Report 6

11/9/2022 - 11/22/2022

Client: Collins Aerospace

Faculty Advisor: Dr. Andrew Bolstad

#### Team Members:

**Sullivan Jahnke** - Project Manager and Machine Learning Co-Lead

**Json Rangel** - Reports, Webmaster, and Communication Systems Co-Lead

**Tyler Mork** - Reports and Communication Systems Co-Lead

**Austin Rognes** - Research and Machine Learning Co-Lead

**Hani El-Zein** - Digital Signal Processing Lead and Research

#### Past Week Accomplishments:

- Sully: Documentation and Training
  - Finished the README so that our clients could build and run the algorithm if they wanted to
  - Trained several models to try and beat Austin by tuning parameters, increasing / decreasing model capacity, and making some changes to the preprocessing of the dataset
  
- Json: Audio File Snipping and Editing
  - Broke down larger KLAX audio into smaller sets to use for training.
  - Tested 48 kHz audio and higher in Simulation (errors occurred).
  
- Tyler: Audio File Snipping/ Test Data Generation
  - Created more 10 second audio files containing KLAX Departure/Approach audio
  - Created .csv data files consisting of signal data generated using Simulink
    - 3 audio .wav files as inputs with varying phase and frequency offsets and differing gains

- Austin:
  - Generated around 30GB of binary training data. Ran many manual verification tests on data generated to guarantee correctness.
  - Created optimization learning\_rate search tool to find the optimal learning\_rate to use.
  - Tried many variations of parameters and found 2 high performing models.
  
- Hani:
  - Helped prepare final presentation
  - Worked on poster
  - Generated training data

### Pending Issues:

- The accuracy of our highest performing model is around 78%
  - We want higher!

### Individual Contributions:

Team Member	Contribution	Hours Spent	Total Hours
Sullivan Jahnke	Documentation and Training	7	80.5
Json Rangel	KLAX audio file edits and resampling	2.5	76.5
Tyler Mork	KLAX audio generation/ Training Data Generation	9	75.5
Austin Rognes	30Gb training data, relatively accurate MLMs.	14	72
Hani El-Zein	Training Data	12	66

### Plans for Coming Week:

- Sully
  - Try to train a model with higher performance
  - Go through all code to ensure cleanliness and documentation
  - Prepare the final presentation and poster session for next Wednesday!

- Tyler
  - Produce more training data with larger diversity of variation in current parameters.
  - Adjust any training data as required by the Software team.
  
- Json
  - Generate some final training data.
  - Update website.
  - Review Simulink simulation versions and iterations for final presentation.
  - Continue to work on Simulation Documentation.
  - Prepare poster and final presentation.
  
- Austin:
  - Compile results and find all important data for the poster.
  - Document our code for the next team.
  - See if the accuracy of our best models can be improved.
  
- Hani
  - Training Data
  - Complete Final presentation
  - Finish poster