

Automated COVID-19 Detection Using Deep Learning

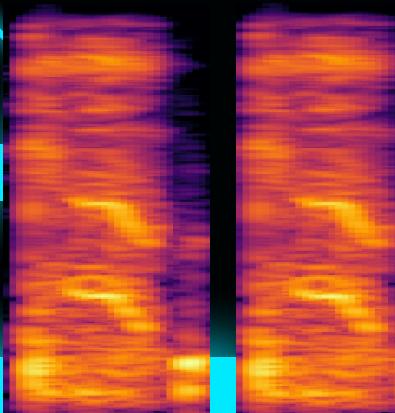
Rodrigo Alarcon, Emma Conti, Lamine Deen,
Audrey Eley
Advisor: Dr. Zahra Nematzadeh

Task Matrix: Milestone 5

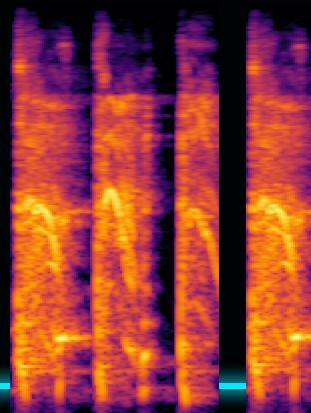
Task	Rodrigo	Emma	Lamine	Audrey
1. Finish cleaning data	0%	100%	0%	0%
2. ML testing and refinement of framework	0%	10%	90%	0%
3. Web testing	50%	0%	0%	50%
4. Integrating Base ML Model with Web Using a Neural Network Framework	50%	0%	0%	50%

Task 1 - Finish Cleaning Data

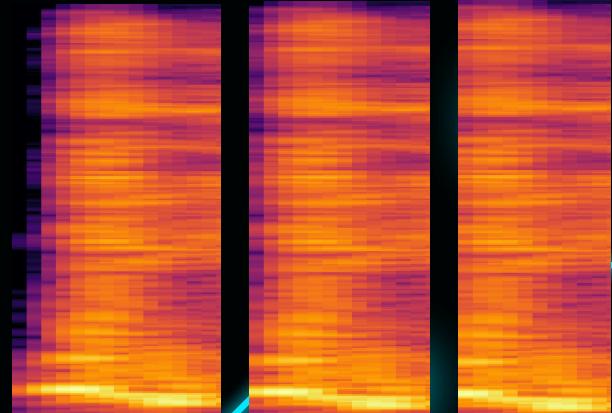
- Shortened all mel-spectrograms to be 1 cough in length to further improve accuracy
 - Removing non cough audio files did not improve accuracy



Audio 23



Audio 242



Audio 226

Task 2 - ML Testing and Workflow Improvements

- Best model

Model Performance Summary & Configuration

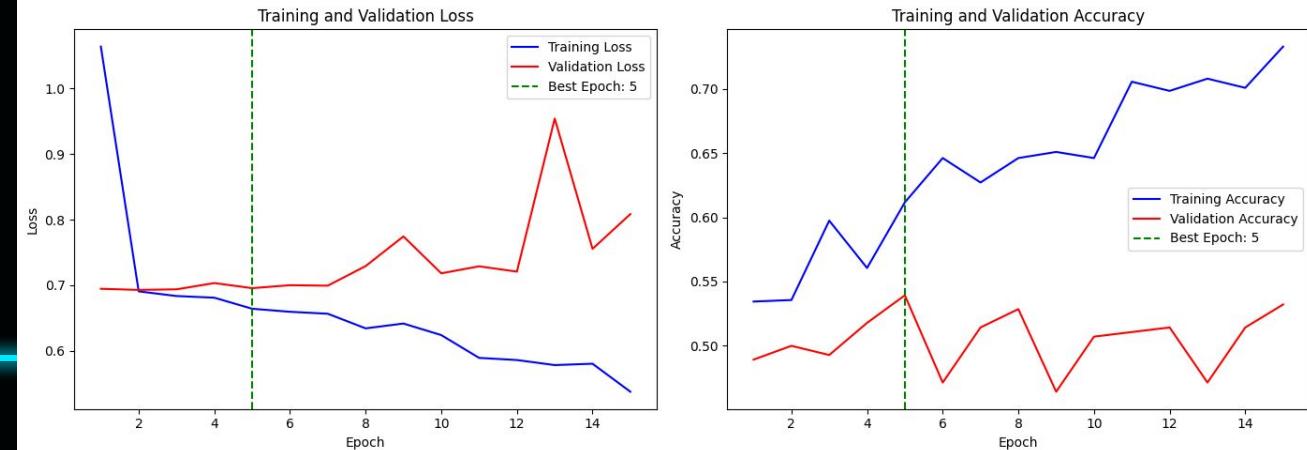
Metric	Training	Validation
Loss	0.54	0.81
Accuracy	73.28% ^	53.21% ^
Prev. Best Accuracy	63.00%	47.00%

Confusion Matrix

	Predicted Healthy	Predicted COVID-19
Actual Healthy	51	86
Actual COVID-19	45	98

Training

Config	Details
Loss Function	CrossEntropyLoss
Optimizer	SGD
Learning Rate	0.01
Momentum	0.5



Task 2 - Refine ML Workflow

- **Oversampling:** Used for the COVID-19 class to address class imbalance.
- **Augmentation:** Applied three techniques to increase dataset size and diversity.
- **Improved Learning:** Enhanced the model's capacity with better preprocessing.
- **Data Split:** 60% Training, 20% Validation set, and 20% Test set.

Task 3 - Web Testing

- Login/logout functionality has passed testing
- Recording functionality in local version of app has passed testing
- Database integration with new user model has passed testing
 - Database integration for audio storage has not yet been tested
- Current method for classifying audio via the local version of the app has failed testing
 - Working to develop an alternative method for requesting classification

Task 4 - ML/Web Integration

- Substituted the trained benchmark for the placeholder ML model
- When the final version of the model is fully refined, it will be substituted for the benchmark model
- As stated in the web testing section, there are still issues with the apps ML classification functionality that we are in the process of resolving

Task Matrix: Milestone 6

Task	Rodrigo	Emma	Lamine	Audrey
1. ML Testing and refinement of framework	Test using benchmark model (ResNet50) and initial testing from our model. Continue to improve the ML model. Determine which improvement strategies to implement based on testing results.			
2. Web testing	Continue implementing and testing additional features to optimize user experience when using the COVID detector, including symptom tracking form.			
3. Integrating WebApp and CNN	Determine what may need to change within the web framework to better accommodate and suit the CNN. Resolve bugs with current integration strategy. Continue to update app with newer versions of CNN as they are developed.			

Milestone 6



April 28

ML Testing



April 28

Refined ML workflow



April 28

Continued Integration of CNN and
WebApp



Questions?

