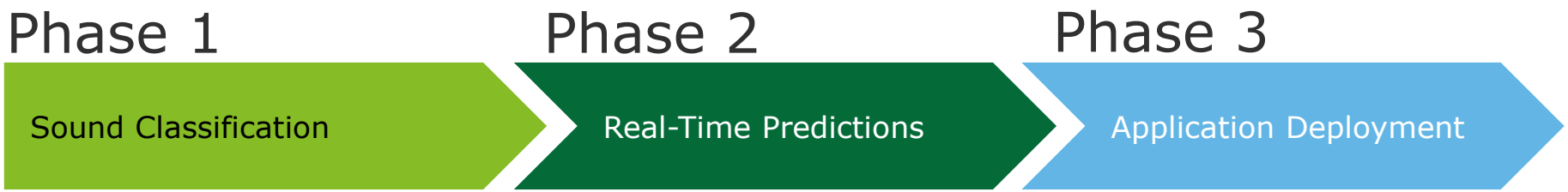
Deloitte.

Phase 1 Modeling

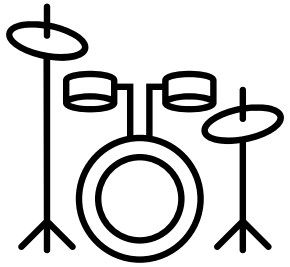
By Landon Tatro

Phase Overview

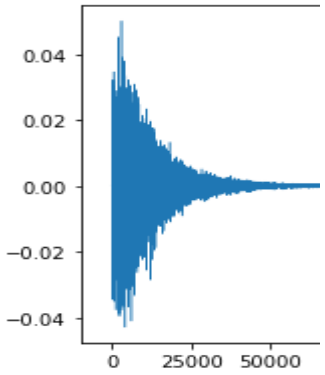


- Complete
- Est. March 1st
- Est. July 1st

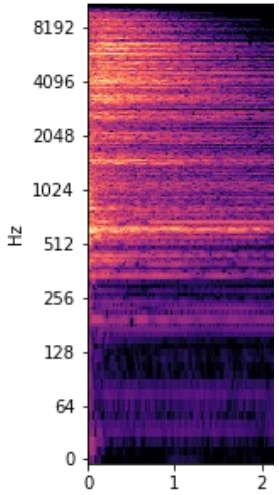
Phase 1 Model Process Flow



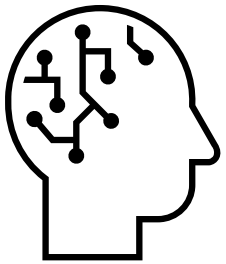
A drum or cymbal is played



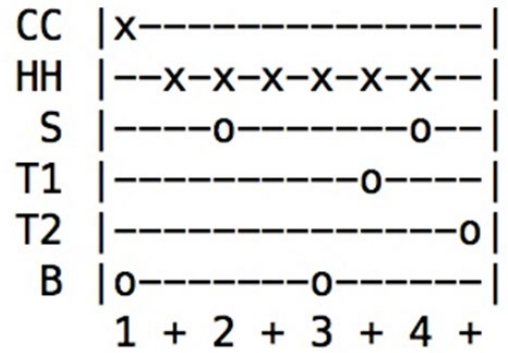
Audio detected



Audio quantified



Features fed to model



Prediction made

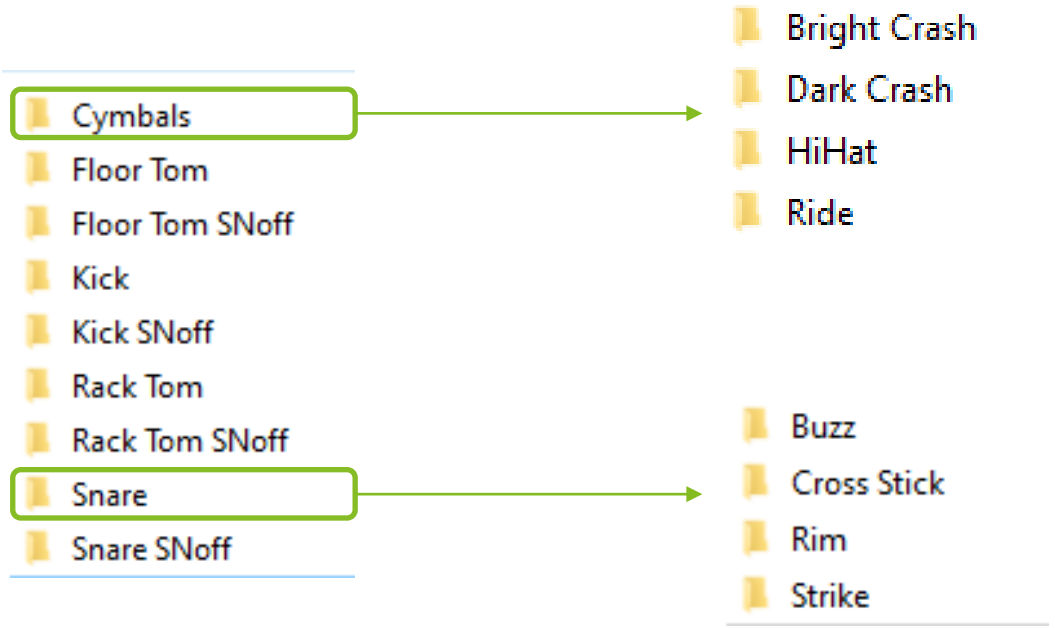
Dataset

Strengths

- Over 5 gigabytes of .wav sound files
- Large variety of sounds within each sound type

Drawback

- Only core drum components



[Link to dataset]

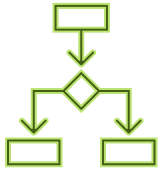
Audio Samples Used

Instrument	Num Samples	Type of Sample
• Snare	576	strike
• Rack Tom	384	strike
• Floor Tom	384	strike
• Kick	480	long kick & dead kick
• Hi-hat	1,280	tip strike & close
• Crash	640	crash, tip strike, & clamp
• Ride	256	tip strike

Seven Instruments: 4,000 samples

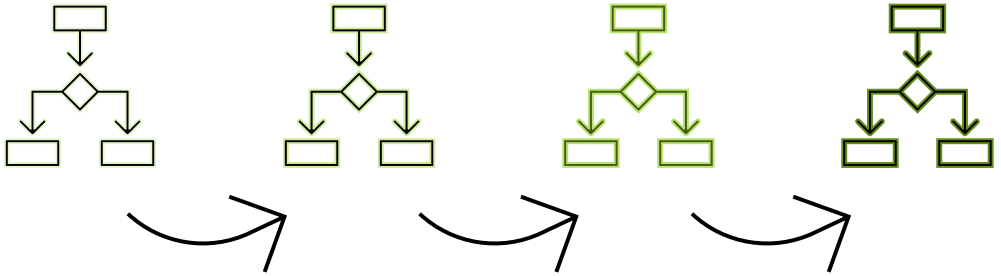
Results

Decision Tree (Baseline Model)



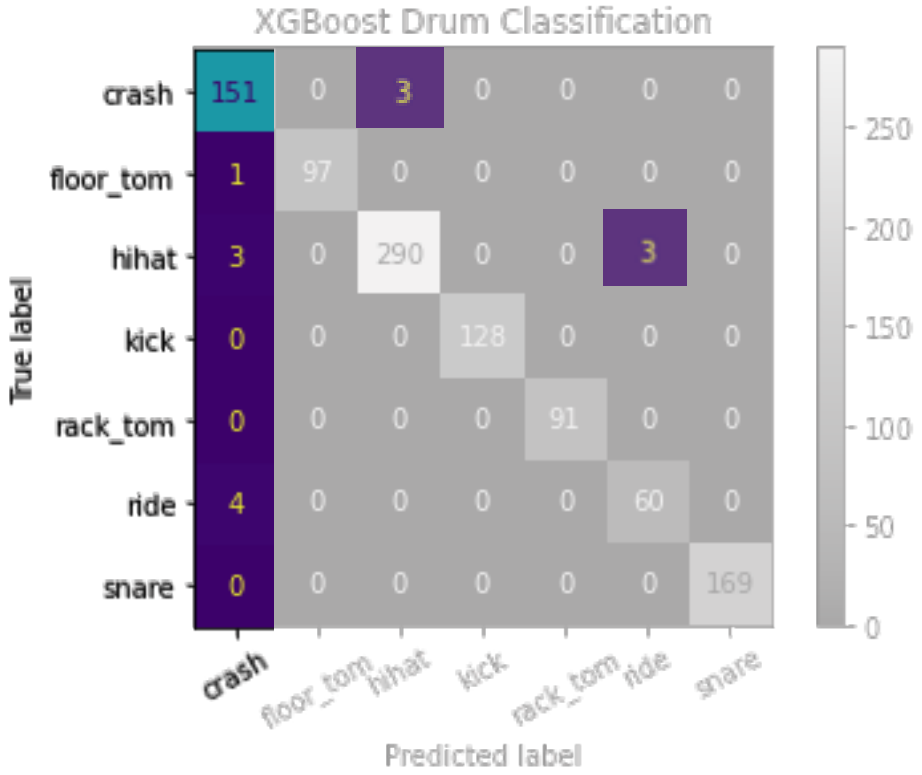
94.1% Accuracy

Extreme Gradient Boost Model (XGBoost)



98.4% Accuracy

Model Misclassification



Model predicted crash cymbal incorrectly 8 times:

- 1 floor tom
- 3 hi-hat
- 4 ride

Cymbals caused confusion

Questions?

Contact me at ltatro@deloitte.com
Link to GitHub Repo