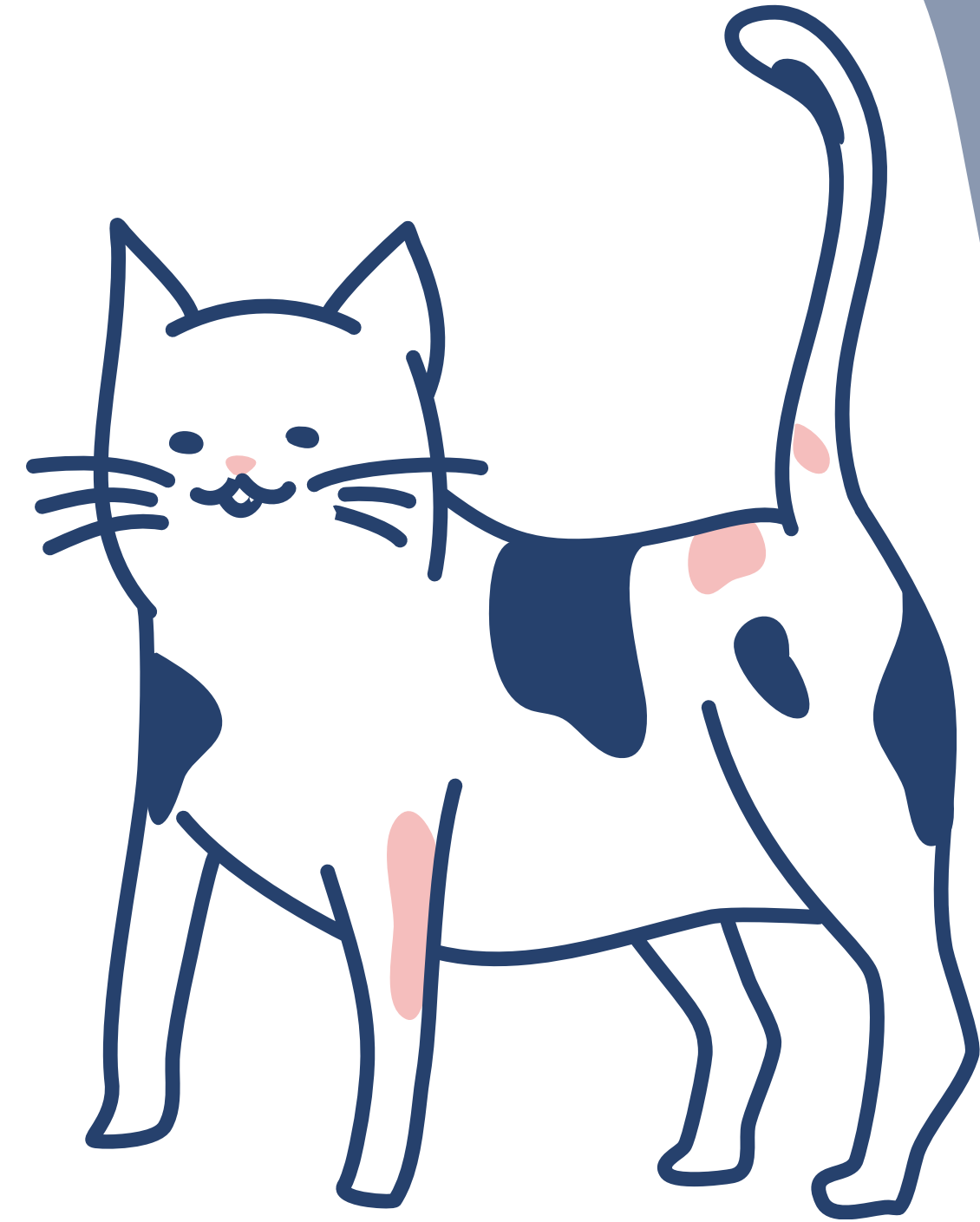


# Meow, Kate, meow!

## Deciphering Kitten's Meows with Neural Network-Based Audio Classification



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**Andrei Hushcha**

**Data Scientist**

**B.A. in Economics**

**Background:** International Business

**Github:** andreihushcha

**Email:** andrew.hushcha@gmail.com

**LinkedIn:** [linkedin.com/in/andrew-hushcha/](https://www.linkedin.com/in/andrew-hushcha/)

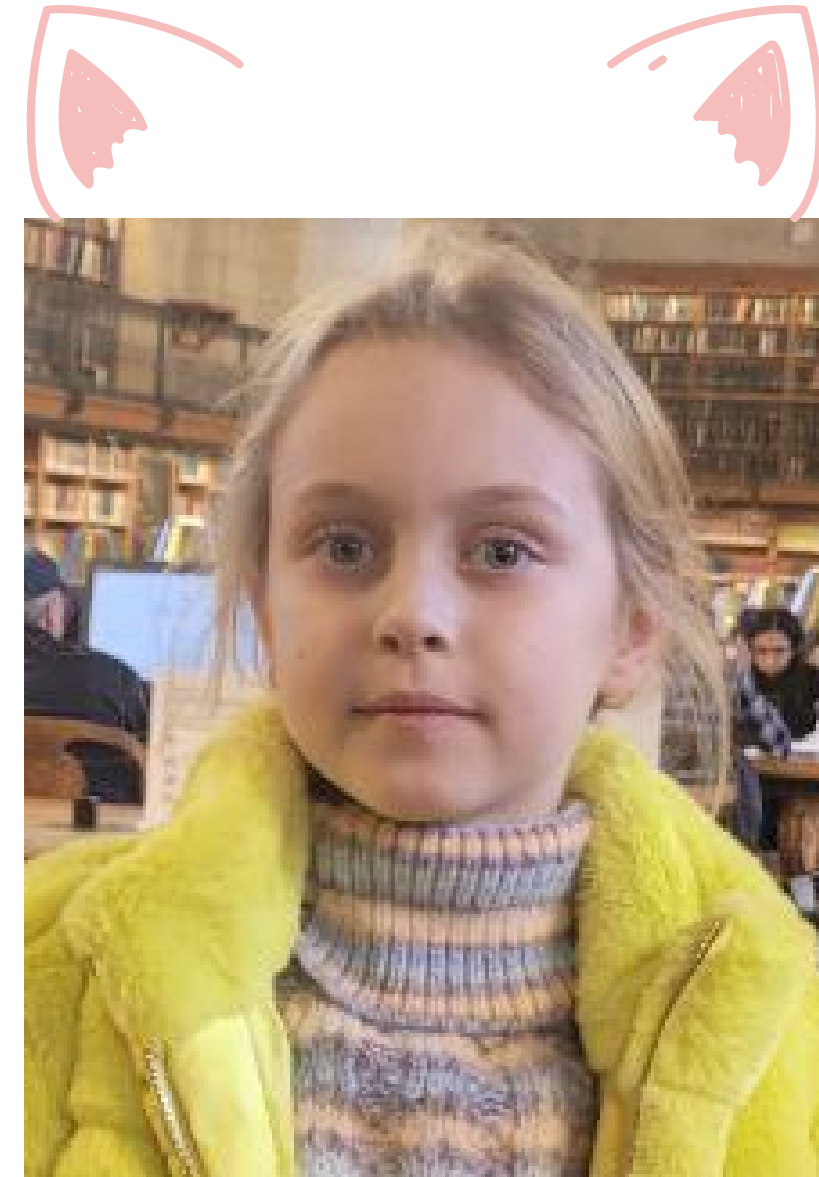
# TEAM



**Mio**

**Role:**

Kitten Vocalizer



**Kate**

**Role:**

Human Vocalizer

# AGENDA

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BUSINESS PROBLEM

02

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DATA OVERVIEW

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ANALYSIS

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MODELING

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PREDICTIONS

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FUTURE STEPS

# BUSINESS PROBLEM



**Many people adopt kittens without understanding their needs: play, food or other care aspects.**

- develop a model that identifies the category of a kitten's meow with high accuracy
- create a mobile app to help better understand pets

# DATA OVERVIEW

**Experiment duration:** 15 days

## **Experimental Contexts:**

- **F (Food):** Capturing Mio's meows before mealtime
- **A (Attention):** Kitten recorded meowing in an isolated room
- **T (Thrill):** Documenting sounds while kitten was being petted
- **KAT (Human):** Human participant randomly mimicking meows

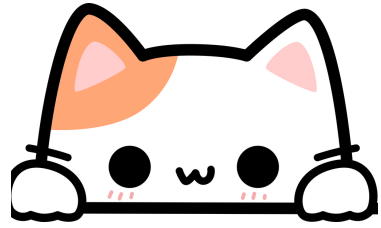
**Total:** 368 audio files

**Length of each file:** under 3 seconds

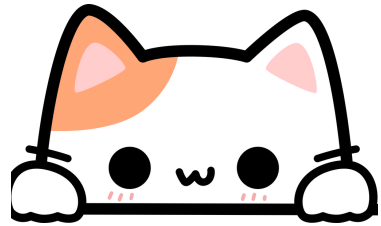
# DATA LIMITATIONS

- One kitten of a specific age, gender and breed
- A particular environment
- The range of the kitten's behaviors

# FINDINGS



**Tuned Sequential Neural Network** exhibited the highest accuracy of **93.2%**



## **Unique properties:**

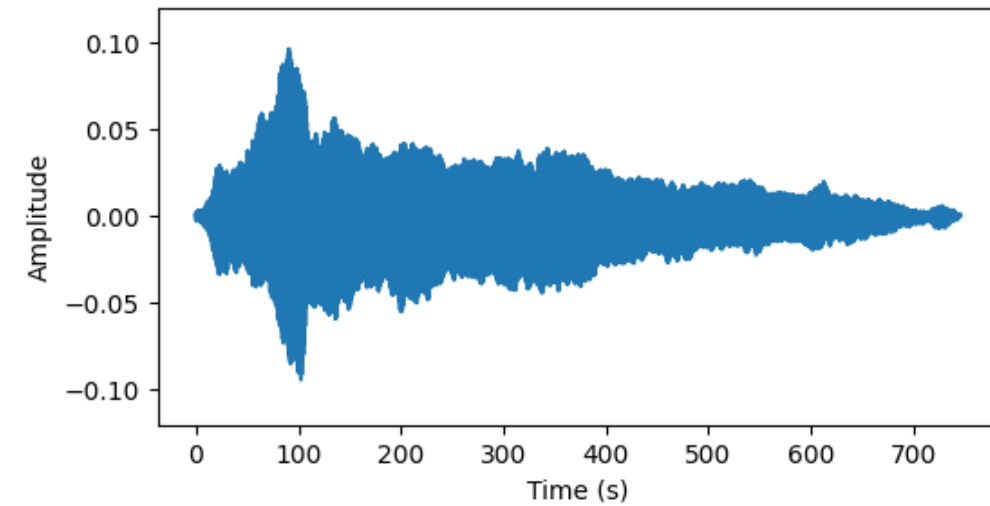
- **Food:** Varied intensity with dominant low frequencies
- **Attention:** Consistent, high-frequency sounds
- **Thrill:** Complex, wide-ranging frequency variations
- **Human:** Stable, monotone sounds, mainly low frequencies



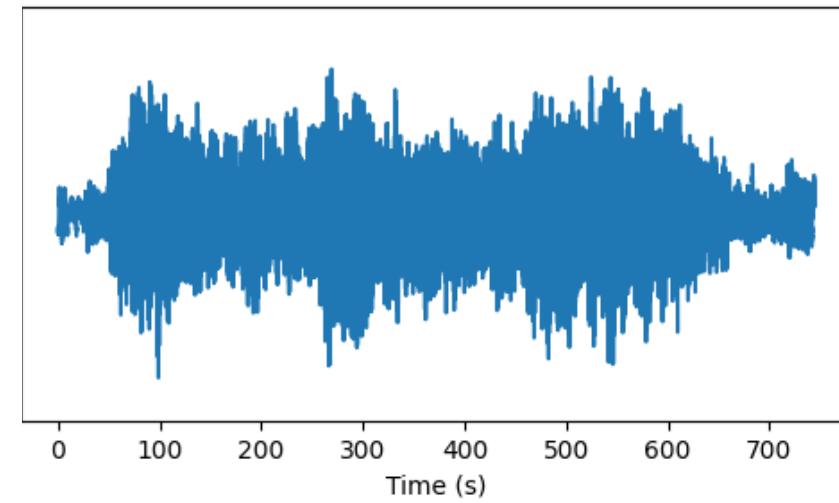
# ANALYSIS

# WAVEFORM

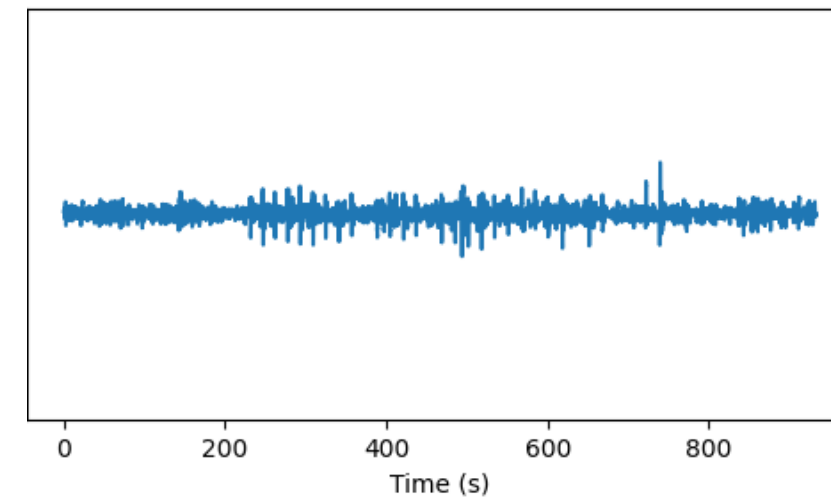
**F**



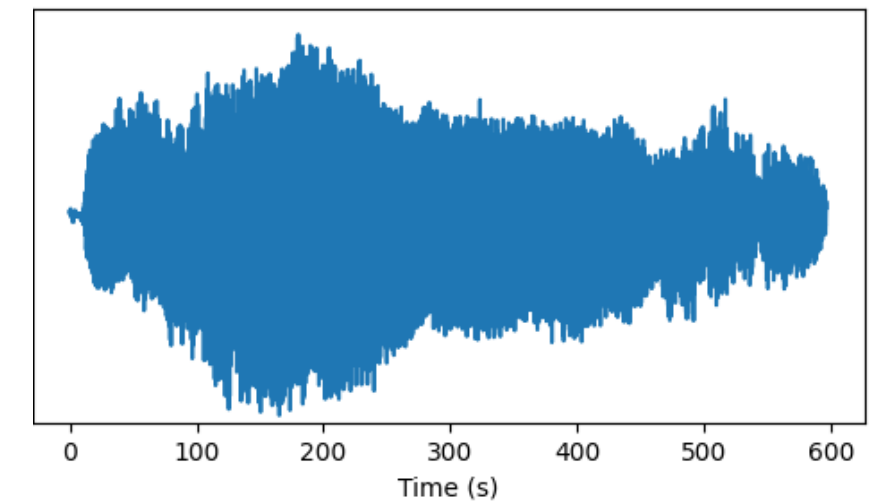
**A**



**T**



**KAT**



**Food:** Fluctuating intensity

**Attention:** Uniform with steady amplitude

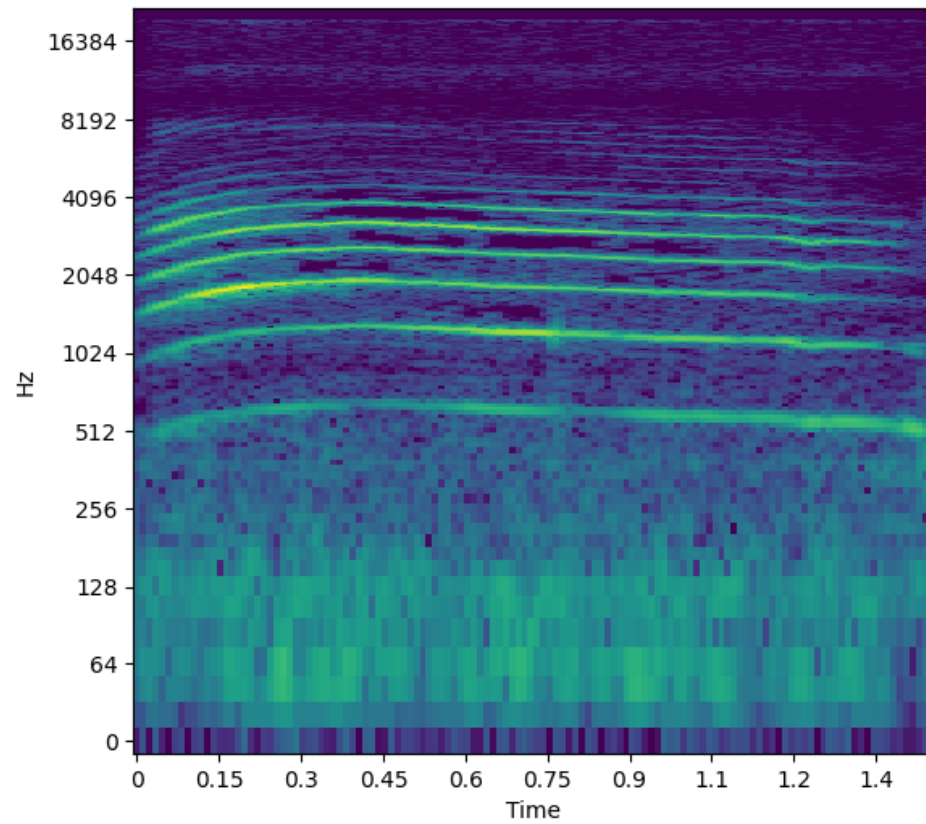
**Thrill:** Highly variable and complex

**Human:** Monotone and even

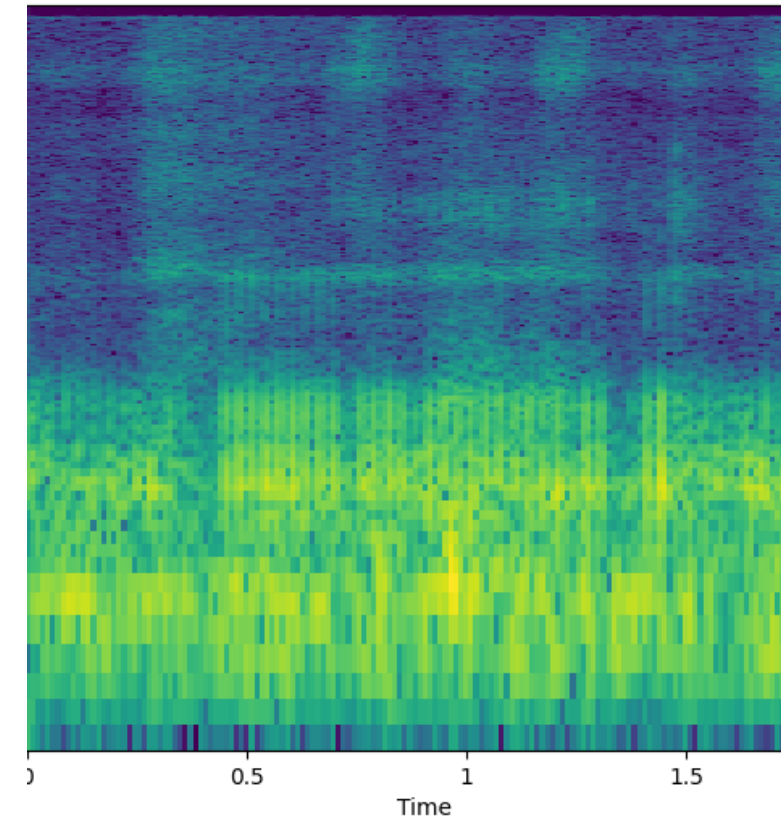


# SPECTROGRAM

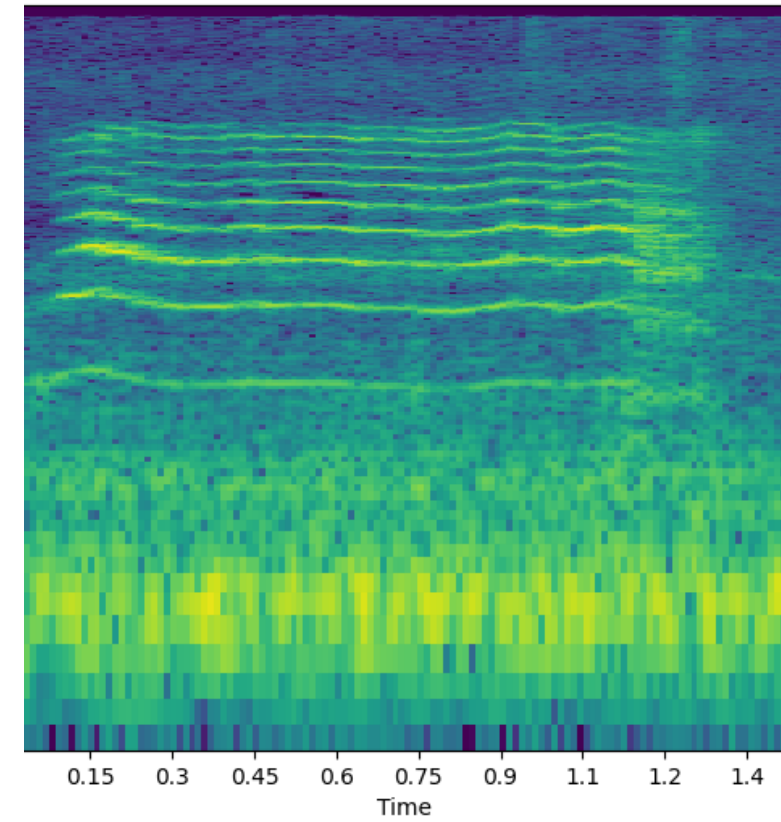
**F**



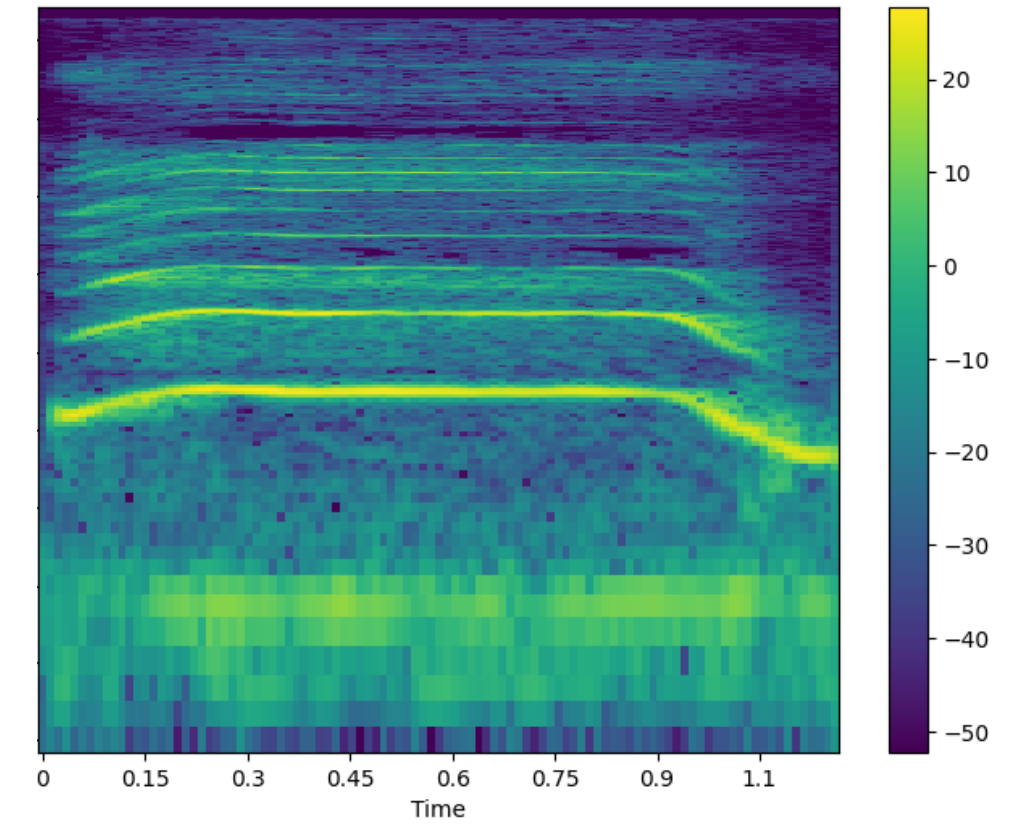
**A**



**T**



**KAT**



**Food:** Certain louder pitches pretty constant over time

**Attention:** Many different pitches

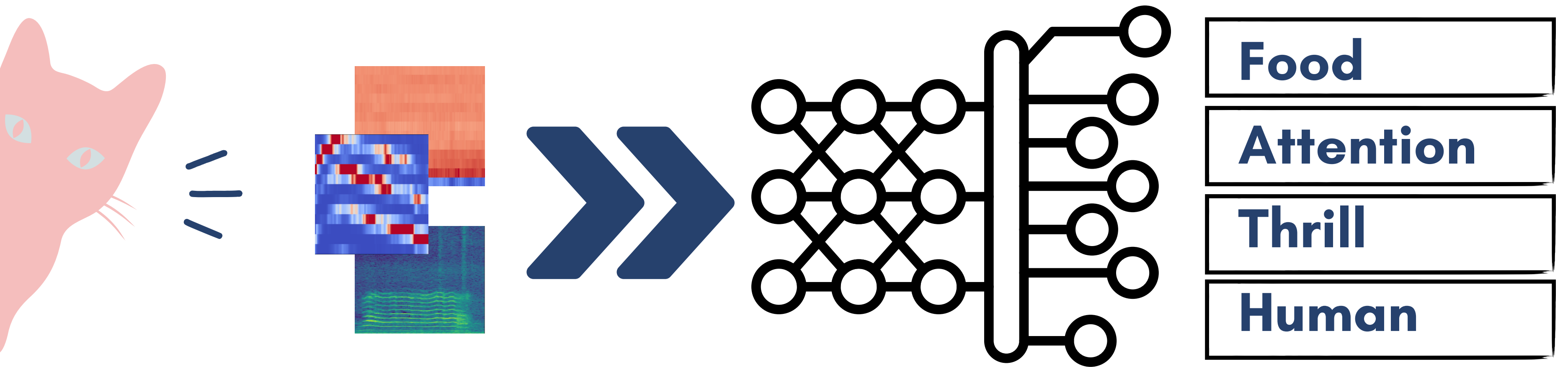
**Thrill:** Loud, low-pitched sounds

**Human:** Similar to Food condition



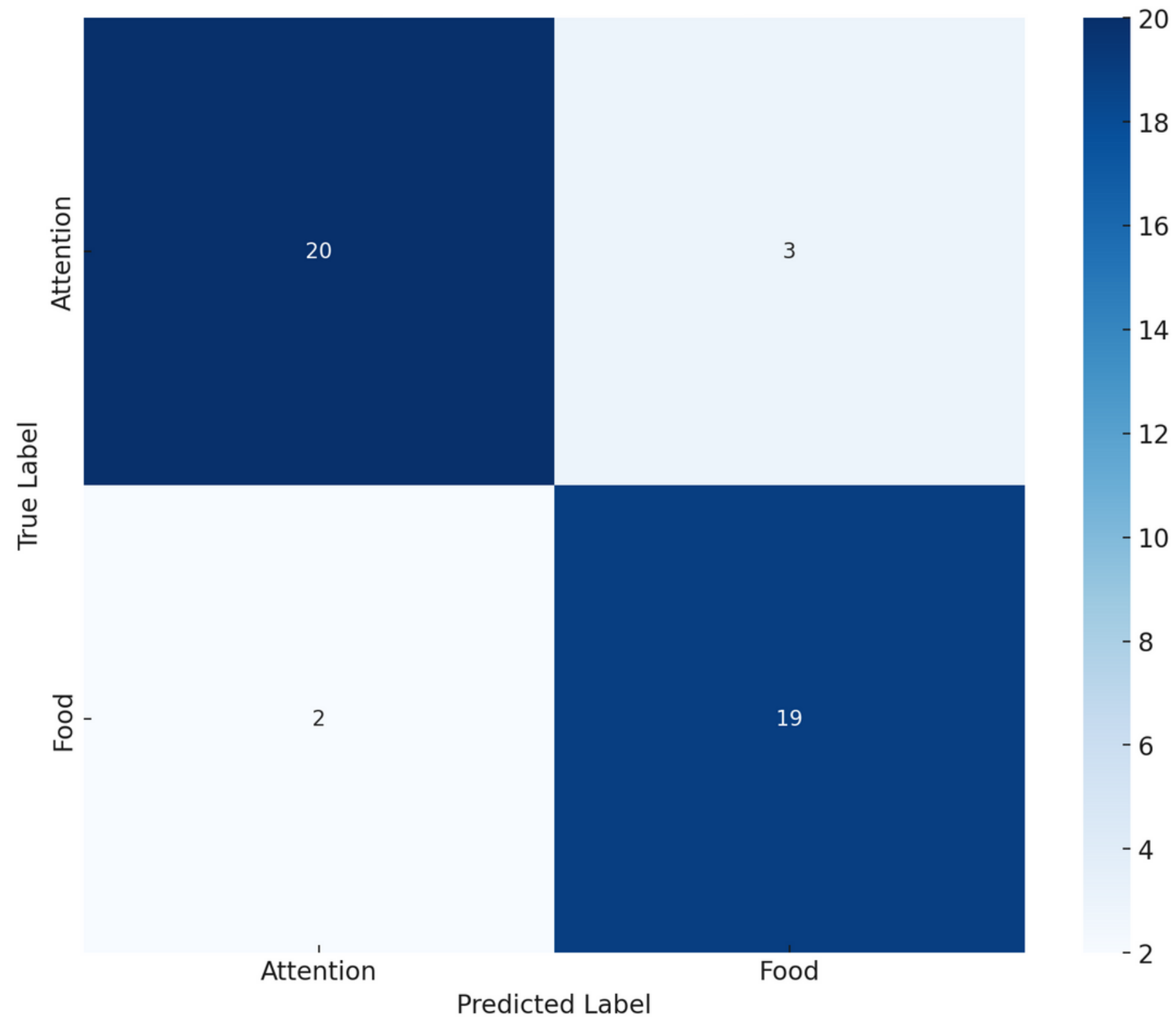
# MODELING

# SEQUENTIAL NEURAL NETWORK



**Accuracy in Class Prediction: 93.2 %**

# CONFUSION MATRIX



# PREDICTIONS

# SAMPLES OUT OF THE DATASET

## Mio: Food

Probabilities for each class:  
attention: **3.65%**  
food: **96.35%**  
human: **0.00%**  
thrill: **0.00%**  
Predicted Class: **['food']**

## Kate

Probabilities for each class:  
attention: **0.00%**  
food: **0.00%**  
human: **100.00%**  
thrill: **0.00%**  
Predicted Class: **['human']**

## Andrei

Probabilities for each class:  
attention: **0.02%**  
food: **0.00%**  
human: **99.98%**  
thrill: **0.00%**  
Predicted Class: **['human']**





# FUTURE STEPS



**Mobile App Development:**  
Connecting since “Hello”



**Database Expansion:**  
The more meows the better

# THANK YOU!

