Bird Audio Classification
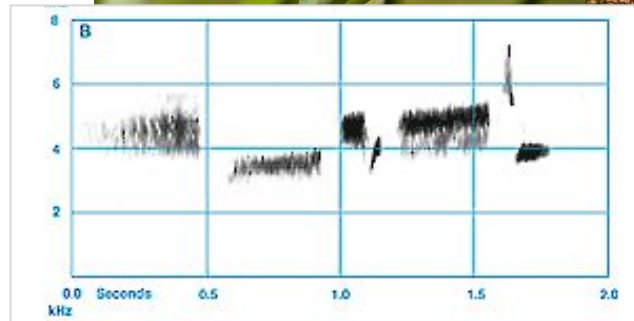
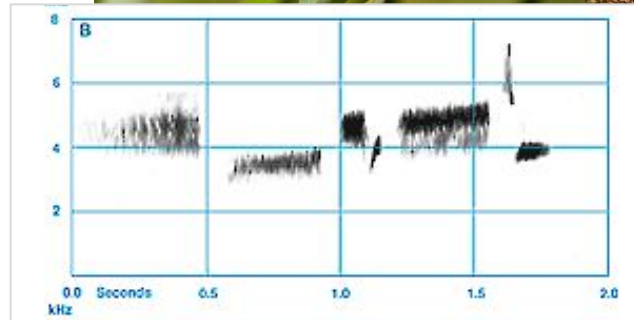Casey Bruns 08.27.2019

Agenda

1. Background
2. Process
3. Results
4. Next Steps

Golden-cheeked Warbler
image source
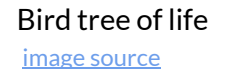
Agenda

1. **Background**
2. Process
3. Results
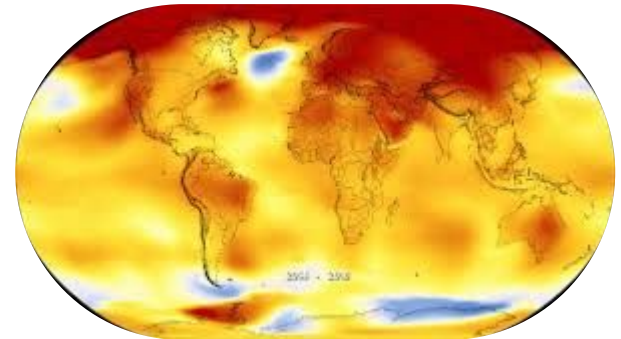4. Next Steps

Golden-cheeked Warbler
image source

Background - Birds

- Well studied

- Diverse

- Ancient

Bird tree of life
image source

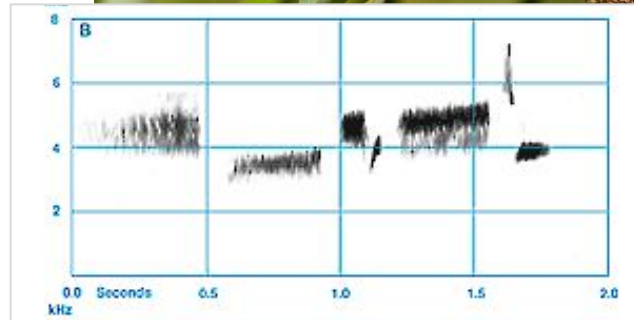# Background – Bird Communication

Background – Who Cares?

NASA Climate Change: 1880-2018

Agenda

1. Background
2. **Process**
3. Results
4. Next Steps

Golden-cheeked Warbler
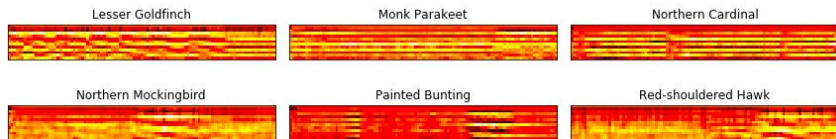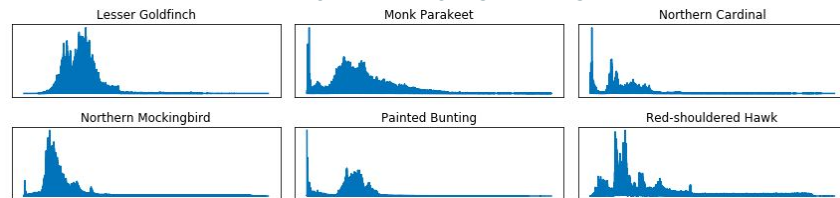image source

Process

Time Series
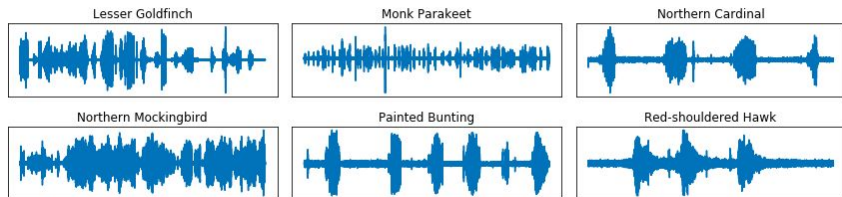
Lesser Goldfinch
Monk Parakeet
Northern Cardinal
Northern Mockingbird
Painted Bunting
Red-shouldered Hawk

1

Fourier Transforms

Lesser Goldfinch
Monk Parakeet
Northern Cardinal
Northern Mockingbird
Painted Bunting
Red-shouldered Hawk

Modeling

4

3

2

Filter Bank Coefficients

Lesser Goldfinch
Monk Parakeet
Northern Cardinal
Northern Mockingbird
Painted Bunting
Red-shouldered Hawk

Mel Frequency Cepstrum Coefficients

Lesser Goldfinch
Monk Parakeet
Northern Cardinal
Northern Mockingbird
Painted Bunting
Red-shouldered Hawk

Time Series

Painted Bunting

© Cleber Ferreira
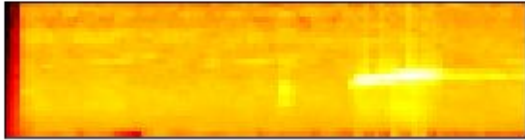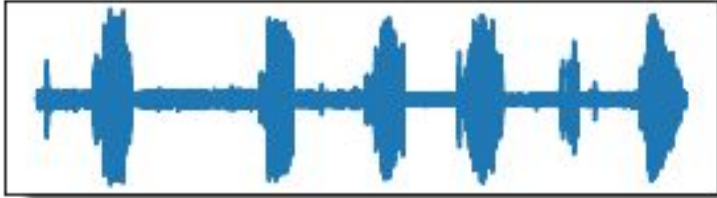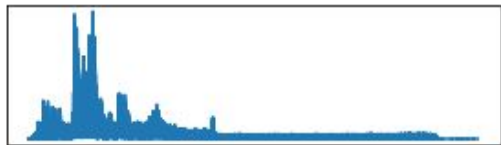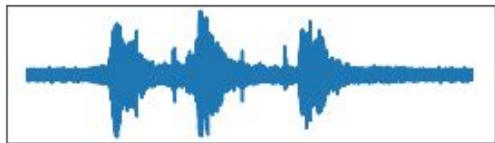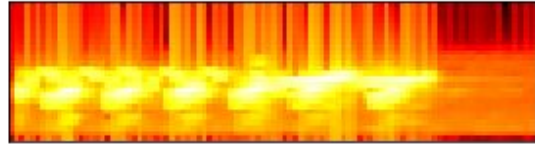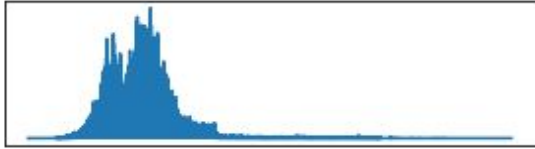
Fourier Transform
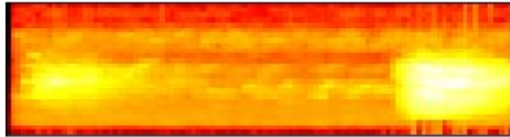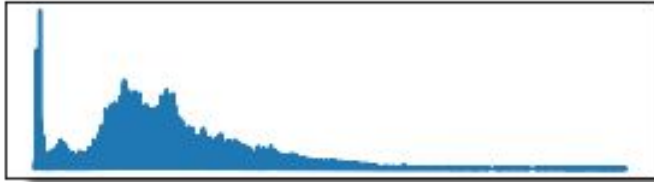
Monk Parakeet

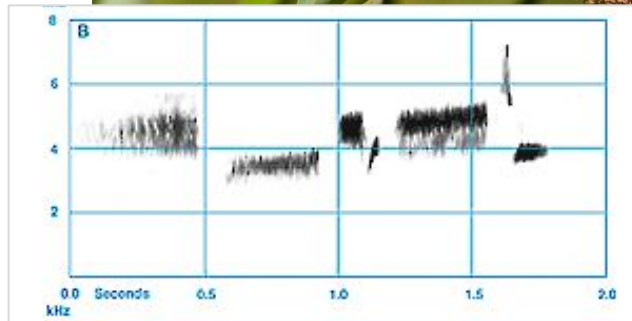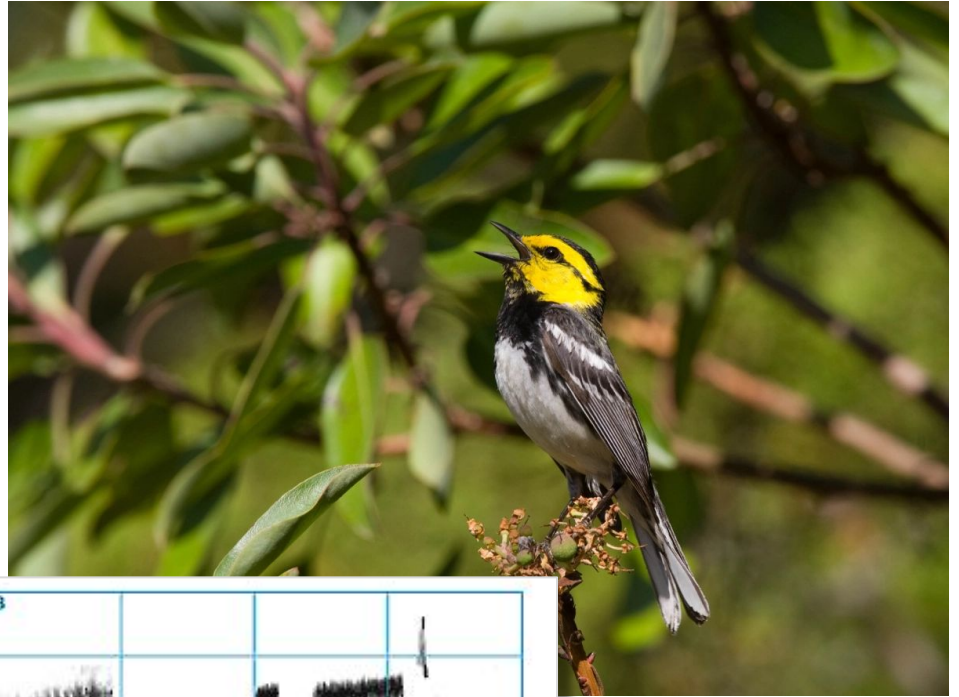# Filter Bank Coefficients
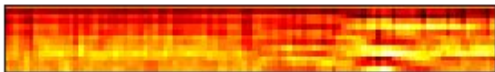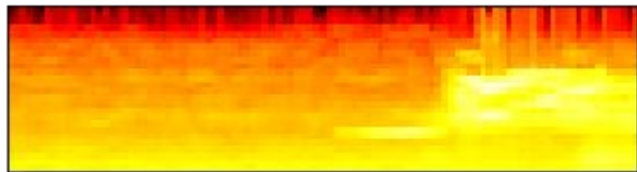
Red-shouldered Hawk

Mel Frequency Cepstrum Coefficients

Lesser Goldfinch

Agenda

1. Background
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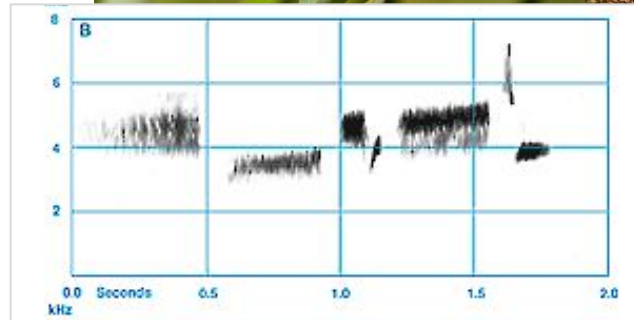

Golden-cheeked Warbler
image source

Results

- Convolutional Neural Network

- Trained on just 10 species

- 67% accuracy

Agenda

1. Background
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3. Results
4. **Next Steps**

Golden-cheeked Warbler
image source

Next Steps

- All N. American species + noise (and other common misclassifications)

- Application

- Acoustic Adaptation Hypothesis

Google Cloud

Azure aws

SongSleuth