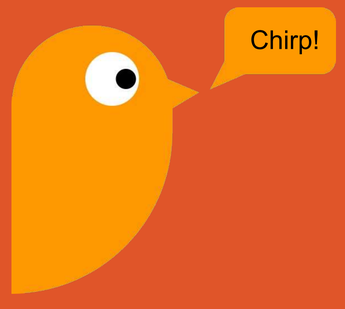
Ornithologists Struggle To Collect Useable Field Data In An Efficient Manner

- The Bird Song Application **Chirp** is a hub for ornithologists to explore, clean, and label bird song data. It combines an intuitive user interface with a powerful data-science driven backend to act as a repository for bird song audio.
- Using audio analysis techniques, it automatically extracts bird calls from hour-long clips recorded in the field, saving researchers valuable time to focus on what really matters: the birds.
- Equipped with a cutting-edge machine learning pipeline, our novel application facilitates a user-friendly approach to identify the bird calls extracted from audio clips, giving both amateur and experts users alike a valuable second opinion identifying which birds they hear.



Oregon State University

Chirp

Simplifying audio collection for avian research

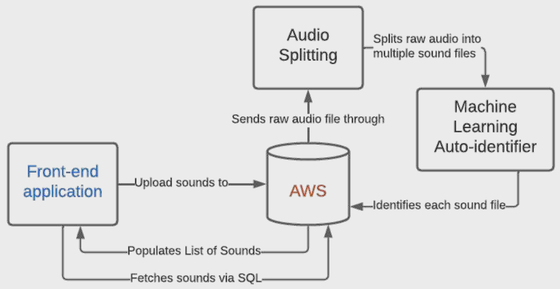


Figure 1: System outline displays the structure of the application. This diagram shows how the front end, back end, and external services are connected.

IMPROVING THE WORKFLOW

- Our application enables ornithologists to explore large swaths of audio data at the touch of a button, acting as a one-stop solution for everything related to bird calls.
- Our user interface is built with Flutter and the Dart programming language to create a clean, responsive, and most importantly, fast user experience.
- By using intuitive Amazon Web Services (AWS) cloud infrastructure, data storage and retrieval is a breeze.
- The design was carefully curated to be simple and intuitive to use, so ornithologists could easily search datasets in the app while the complicated data-science could be handled behind the scenes.

OPENING THE DOOR FOR AUDIO ANALYSIS

For ornithologists, one of the principle areas of study is bird vocalization. These give information about the presence, quantity, and behavior of birds in certain areas. Because of this, field research often produces hours-long clips of audio with only the occasional bird call among the noisy silence. Imagine manually listening to all of that data to count and analyze the target bird call! Our application uses innovative audio analysis technology to automatically split these long clips into the notable bird-call events, saving users hours of listening to wind and rain to find these vocalizations.

Oftentimes, researchers collect these sounds without actually seeing the birds. What good is a bird sound if the corresponding bird cannot be identified? Our application utilizes a novel machine learning approach to identify birds based on their calls, allowing users to take an unknown bird sound and determine which candidate bird made the call.

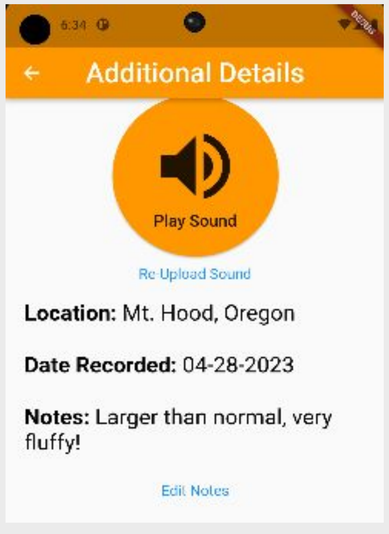


Figure 2: Example of the in-app user interface. This screen displays any and all information about an uploaded sound.

ACKNOWLEDGEMENTS

Corvallis Developers

- Anju Mathew



- Cole Theodore



- Miya DeGeer



E-Campus Developers

- Caleb Elson
- Jesse Piccione

Machine Learning Support

- Roopesh Bangalore Ravishankar

Expert Advisory Board

- Kurt Trzcinski trzcinskiconsulting.com

Project Partner

- Patrick Donnelly soundbendor.org
  Computer Science, Oregon State University

soundbendor lab