

## Description

SoundBender Lab is a cutting-edge research and development company that is making waves in the field of machine learning. Their latest project, a machine learning model designed to accurately identify bird species in audio clips, is poised to be a game-changer in the industry. But how can they ensure that their model is accurate and reliable? This is where Chirp comes in.

Chirp is a mobile application that has been specifically designed to help SoundBender Lab collect data on the accuracy of their machine learning model predictions. This is achieved through a number of unique features that have been carefully crafted to ensure that the app is both user-friendly and effective.

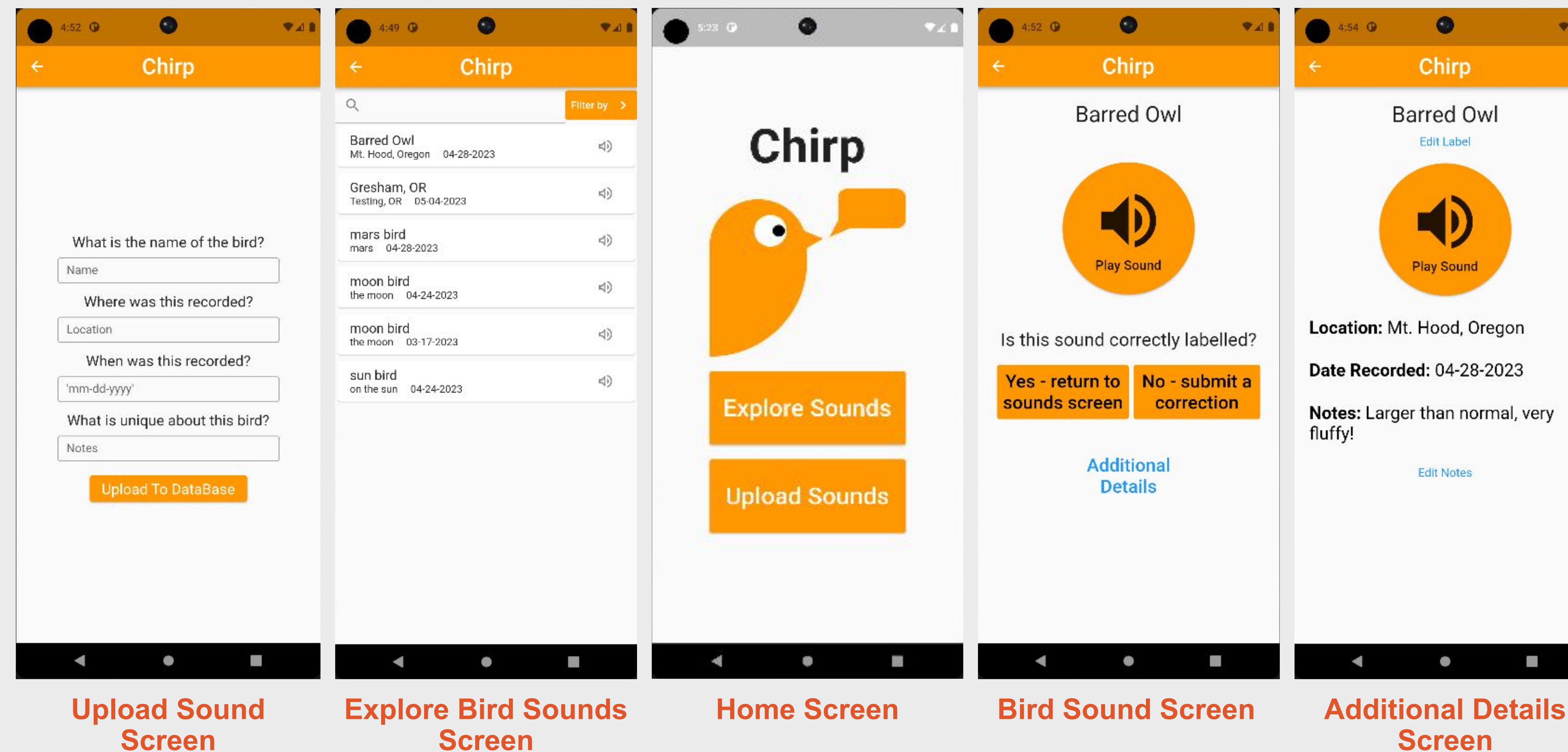
One of the key features of Chirp is its use of Google's Open Source UI development kit called Flutter. This powerful toolkit allows developers to create high-quality, cross-platform mobile applications that can be used on both Android and iOS devices. Additionally, Flutter is written in Dart, another programming language created by Google, which means that it is fully optimized for mobile development.

Another important aspect of Chirp is its cloud-based AWS database and heap storage backend. This allows users to upload bird sounds for audio processing, traverse a list of bird sounds that is actively listening to the backend for updates, view more comprehensive descriptions of user-specified birds, filter through a list of birds by name, and correct or verify SoundBender Lab's machine learning model predictions.

Overall, Chirp is an incredibly powerful tool that has been designed with both usability and functionality in mind. Whether you are a professional bird watcher or simply a curious nature enthusiast, this app is sure to be an invaluable resource for anyone who wants to learn more about the birds around them. With its advanced machine learning capabilities and user-friendly interface, Chirp is set to change the way we think about bird identification forever.



## A mobile app for correcting machine learning model predictions



## Key Features

- Bird species prediction:** Chirp allows users to upload an audio clip of a bird sound and receive a prediction on the bird species present in the clip.
- Machine learning model accuracy tracking:** The app collects data on the accuracy of Soundbender Lab's machine learning model predictions and allows users to correct or verify those predictions.
- User interface:** The app is designed with Flutter, a powerful UI development kit from Google, and has a user-friendly interface.
- Cloud database and heap storage:** Chirp's backend is hosted on AWS and includes a database and heap storage for efficient data management.
- Bird sound library:** Users can access a comprehensive list of bird sounds and filter through them by name via search bar.
- Bird species descriptions:** Chirp provides a more comprehensive description on what kind of bird is found in an audio clip.
- Real-time updates:** The app actively listens to the backend for updates on the bird sound library.
- Audio processing:** Chirp allows users to upload an audio clip and for the machine learning model to process it for bird species prediction.

## Technologies Used

- Dart** - a programming language design by *Google*.
- Flutter** - an open-source Cross-platform UI development kit by *Google*. Used to streamline and standardize the components of Chirp.
- AWS Amplify** - A powerful suite of tools for integrating a backend with AWS, used to develop and configure Chirp's backend.
- Android Studio** - an Android development IDE designed by *JetBrains' IntelliJ IDEA*, for developing the android side of Chirp.
- XCode** - a iOS Development IDE designed by *Apple* for developing the IOS side of Chirp.

## What's next?

- A search by location functionality.
- Adding a user login schema.
- Refine Machine learning model with collected data.
- Refine data model on bird app.

## Development

Chirp, a mobile application, underwent development utilizing the agile scrum model, a popular ideology. The initial phase of the development process involved creating a prototype of the application using Figma, a prototype modeling tool. The prototype was presented to the client for approval, and upon receiving positive feedback, the implementation phase began. The first step in implementation was to translate the prototype into a Flutter User Interface, followed by routing the bird song data model into the mobile UI. The final phase of development focused on constructing and integrating a backend bird sound library, which was hosted on aws and configured using amplify nosql and heap storage. By utilizing this comprehensive development approach, Chirp was able to create a seamless user experience that connects users to the sounds of nature.

## Acknowledgements

### Project Partner

- Assistant Professor Patrick Donnelly

### Developers

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### Expert Advisory Board

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