A collection of fully-annotated soundscape recordings from the Island of Hawai'i

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Abstract

This collection contains 635 soundscape recordings with a total duration of almost 51 hours, which have been annotated by expert ornithologists who provided 59,583 bounding box labels for 27 different bird species from the Hawaiian Islands, including 6 threatened or endangered native birds. The data were recorded between 2016 and 2022 at four sites across Hawai'i Island. This collection has partially been featured as test data in the 2022 BirdCLEF competition and can primarily be used for training and evaluation of machine learning algorithms.

Keywords

Autonomous recording units, Bioacoustics, Birds, Bird calls, Passive acoustic monitoring, Soundscapes

Data collection

Soundscapes for this collection were recorded for various research projects by the Listening Observatory for Hawaiian Ecosystems[1] (LOHE) at the University of Hawai'i at Hilo. The recordings were collected using Wildlife Acoustics Inc.[2] Song Meters (models 2, 4, or Mini), as 16-bit wav files at a sampling rate of 44.1 kHz, using the default gain settings of each model. Further specifics for each recording, such as recording location and habitat type, can be found in the metadata provided. Soundscapes in this collection vary in length, ranging from just under a minute to 9 minutes in duration. All audio was unified, converted to FLAC, and resampled to 32 kHz for this collection. Parts of this dataset have previously been used in the 2022 BirdCLEF competition [1].

Sampling and annotation protocol

This collection is a subset of the files recorded over the course of the LOHE lab's respective studies. The data were subsampled for annotation by aurally scanning the recordings and visually scanning spectrograms generated using Raven Pro[3] software for target species of interest to the individual research project for which each recording was collected. Recordings that did not contain vocalizations of the species of interest were excluded from full annotation and thus this collection.

Using Raven Pro, annotators were asked to create a selection box around every bird call they could recognize, ignoring those that were too faint or unidentifiable at a spectrogram window size of 700 points. Provided labels contain full bird calls that are boxed in time and frequency. Annotators were allowed to combine multiple consecutive calls of the same species into one bounding box label if

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[1] https://lohelab.org
[2] https://www.wildlifeacoustics.com
[3] https://ravensoundsoftware.com/software/raven-pro/

pauses between calls were shorter than 0.5 seconds. We converted labels to eBird species codes, following the 2021 eBird taxonomy (Clements list).

Files in this collection

Audio recordings can be accessed by downloading and extracting the "soundscape_data.zip" file. Soundscape recording filenames contain a sequential file ID, site ID, recording date, and timestamp in HST. As an example, the file "UHH_001_S01_20161121_150000.flac" has sequential ID 001 and was recorded at site S01 on Nov 21st, 2016 at 15:00:00 HST. Ground truth annotations are listed in "annotations.csv" where each line specifies the corresponding filename, start and end time in seconds, low and high frequency in Hertz, and an eBird species code. These species codes can be assigned to the scientific and common name of a species with the "species.csv" file. The approximate recording location with Universal Transverse Mercator (UTM) coordinates and other metadata can be found in the "recording_location.csv" file.

Acknowledgements

References

[1] Kahl, S., Navine, A., Denton, T., Klinck, H., Hart, P., Glotin, H., Goeau, H., Vellinga, W., Planque, R., & Joly, A. (2022). Overview of BirdCLEF 2022: Endangered bird species recognition in soundscape recordings. In *CLEF 2022 (Working Notes).*