

ECHO-TRACKS

(Ecological Cave Health Observation and Tracking for Rapid Assessment of Contagion in Key Species)

UAH Fall 2024 EE Senior Design

Project Overview

Our senior design project is the culmination of everything that we have learned throughout our time as engineering students at UAH. Over the course of this semester we have worked in a team of 4 to put together a project to present to the EE department and our advisor.

The project we chose is to create an ultrasonic recording system that is capable of recording the echolocation calls from bat populations in northern Alabama. It is hypothesized that observing the frequencies at which the bats make these calls could aid in the identification of species and potential illnesses.

Technical Specs

To address the technical needs of our project our team chose to use a combination of many analog and digital electronic components as well as software to perform Digital Signal Processing (DSP).

The hardware for our system will consist of an Ultrasonic Microphone, Phantom Power Circuit, Audio Amplifier, Analog to Digital Converter, and a Raspberry Pi. The software component of our project consists of the DSP that will be done on the Raspberry Pi utilizing a Matlab

The Batmen



Our Team Consisted of Caleb Blair (Team Lead), Brandon Rostenbach (Software Lead), Nathaneal Ferster (Documentation Lead, and Gage Abernathy (Hardware Lead). Each of us had a great time working on this project and are proud of the work we accomplished.

script. The script performs a fourier analysis on the .wav file that identifies the peak in the signals. These peaks represent individual echolocation calls.

