

## Research Experience Placement (REP) Scheme Project

**Project Supervisors:**

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**Host Organization and Department (if applicable):**

Durham University, Biosciences

**Project Title:**

Using AI to understand seasonal variation in the UK dawn chorus

**Project Description:**

It is increasingly recognised that natural soundscapes (the sounds of wildlife and the environment in an area) have a marked impact on human well-being, and are a major attractor of people to greenspace. However, our understanding of natural soundscapes remains limited. Automated audio recording units (ARUs) have the potential to transform biodiversity recording for species with recognisable vocalisations. This has important implications for ecological studies, conservation management and monitoring. However, although ARUs collect huge amounts of data, classifying those data remain a significant obstacle to their wider use. The current project will make use of a new piece of automated classification software that clusters groups of very similar singing events. We also have >3 years of dawn chorus recordings from 20+ woodland sites across the UK on which to trial classification. We will apply the software to these recordings and classify each of the clusters by species (no prior birdsong knowledge required). From this, we will be able to explore, for the first time, variation in the timing (both within and among sites) in the singing of individual species across the UK. We will also deploy a series of recorders locally, to explore the performance of the software during mid-summer, typically a much quieter time of the year for birdsong.

**Skills and Career-Development Opportunities:**

The current project will provide the student with invaluable experience of exploring ecological data from across the UK, with relatively little requirement for prior knowledge. This will provide an invaluable introduction to soundscape ecology. Such research, exploring large remotely collected datasets is at the forefront of ecological and conservation research, and hence will provide a great springboard to future career opportunities.

**Wider context of research:**

The student will join a very active conservation ecology group (conservationecology.org) and hence participate in weekly lab meetings (via zoom at present). We have about 50% lab occupancy at the moment, so we would anticipate the students physically working in Biosciences in Durham. We already have suitable computing for the project, and some ARUs to deploy. As ARU deployment will be locally around Co, Durham, covid travel restrictions will not be an issue.

**Project Timeframe:**

Week 1: familiarisation with singing birds, using e.g. training and test facilities on our [www.naturesuadio.org](http://www.naturesuadio.org) website. ARU familiarisation and deployment locally.

Week 2: familiarisation with Kaleidoscope software and typical audio files.

Weeks 3-4: Basic run of selected UK woodland soundscapes through Kaleidoscope and exploring classification success

Weeks 5-6: Following refinements from wk3-4, finalised runs of fuller UK woodland soundscapes and plotting of species-specific patterns.

Week 7: collection of local data to compare classifications on less dense audio data.

Week 8: Final comparison of classification performance from the two datasets. Brief report production and present findings to lab group meeting.