

Dowthwaite MScR Scholarship 2023/24 entry

DEPARTMENT OF PHYSICS

Principal Supervisor: Prof C. S. Adams

Other Supervisors: R. M. Potvliege

Project Title/Theme: Networked bioacoustics for monitoring biodiversity.

Project Description

Biodiversity loss is significant challenge for the future of the planet linked to but also in some cases in addition to climate change.

This project is focused on improving our techniques for biodiversity monitoring. In particular, we shall focus on the automated bioacoustic monitoring of bird populations and bird movements. It has indeed been recognised for some time that particular bird species as well as whole bird communities are useful bioindicators of their natural environment [1,2]. In terms of conservation, there is also an obvious need for clarity on the presence and numbers of individuals of rare species in particular habitats. Birds lend themselves well to bioacoustic monitoring. Automated monitoring methods are attractive in this context, particularly in conjunction with the machine learning methods that are currently developed for a fast analysis of long recordings [3]. A major challenge for current techniques is that there is limited potential to count the number of a particular species in a soundscape. To address this, we will employ multiple microphones and analyse both the signal amplitude, but also phase, in order to extract spatial information. Spatial information is relevant not only for disambiguating different individuals in a soundscape but also for recording the direction of flight and altitude of migrant birds [4].

[1] E. Padoa-Schioppa, M. Baietto, R. Massa and L. Bottoni, "Bird communities as bioindicators: The focal species concept in agricultural landscapes", *Ecological Indicators*, 6, 89 (2006).

[2] F. Morelli et al, "The common cuckoo is an effective indicator of high bird species richness in Asia and Europe", *Scientific Reports*, 7, 4376 (2017).

[3] D. Stowell, "Computational bioacoustics with deep learning: a review and roadmap", *PeerJ Life and Environment* 10:e13152 (2022). DOI 10.7717/peerj.13152.

[4] B. M. Van Doren et al, "Automated acoustic monitoring captures timing and intensity of bird migration", *Journal of Applied Ecology*, 2022;001-12 (2022). DOI 10.1111/1365-2664.14342.

How to apply

You must apply through the University's [applicant portal](#)

You will need to:

- State 'QLM and Networked bioacoustics for monitoring biodiversity in the 'Field of Study' section.

- On the funding tab select 'yes' you are applying for a scholarship, select 'Other' write DOW231 in the name of the scholarship, and select 1st October 2023 as the start date
- attach a covering letter and CV
- attach degree transcripts and certificates and, if English is not your first language, a copy of your English language qualifications.
- provide 2 referee contact details (specifically email addresses) who we will contact directly.

Contact

For enquiries please contact Prof Stuart Adams c.s.adams@durham.ac.uk