



# AIMS

African Institute for  
Mathematical Sciences  
SOUTH AFRICA

## POSTDOCTORAL RESEARCH FELLOWSHIP (2 YEARS IN CAPE TOWN, SOUTH AFRICA)

# DEEP LEARNING & BIOACOUSTICS

A recent report issued by the WWF states that there has been a catastrophic decline in wildlife population in recent years. A large number of species are threatened with extinction due to a number of factors. Further conservation efforts are still urgently required to ensure the survival of the remaining individuals. The African Institute for Mathematical Sciences (AIMS) and Stellenbosch University are looking to appoint a post-doctoral fellow to work in the area of deep learning and bioacoustics. The fellow will work as part of a collaborative team of local and international researchers to address important conservation issues.



This fellowship aims at investigating deep learning models for passive acoustic monitoring of animal species. The data will primarily be acoustic data, however additional sources may be used to supplement the investigation. The fellow will research state-of-the-art techniques in deep learning and mathematics to address critical conservation problems. The fellow will develop software code for audio processing, and suitable deep neural networks, typically in TensorFlow or other libraries. Research outputs will be submitted to Q1 ranked international journals.

The fellow will work closely with Dr. Emmanuel Dufourq and the Machine Learning for Ecology Research Group. The fellow will work at AIMS South Africa which is located in the beautiful city of Muizenberg, Cape Town, South Africa. AIMS is located just a few meters from Muizenberg beach! The fellow will also have the opportunity to travel to Rwanda in both years.





### Core Responsibilities:

- Review literature in deep learning for bioacoustics. Discuss, share, and write relevant literature reviews.
- Participate fully in the project including research design, software and model implementation, data analysis, data annotation, writing manuscripts, and giving academic talks.
- Maintain research code in a GitHub repository and use current programming practices.
- Actively participate in research meetings and take initiative to grow the group's collaborative network.
- Co-supervise students in the area of deep learning for wildlife monitoring.
- Assist the research group in research and academic tasks.
- 40 hours of research work per week.

### Requirements:

- Ph.D. in a relevant mathematical science (e.g. computer science, mathematics, ...).
- Strong experience in deep learning (TensorFlow, PyTorch,...) and Python programming.
- Clear evidence of completed deep learning projects in computer vision or audio tasks.
- Good mathematical and problem solving skills as the candidate will actively engage in this.
- A strong desire to apply machine learning to bioacoustics problems.
- Proven ability to publish in reputable peer-reviewed journals (Q1 or Q2 ranked, [check ranking here](#)).
- Be independent and driven for academic outcomes and have a desire to share knowledge and work in a collaborative and respectful manner.
- Very strong communication skills (English written, oral, and presentation).

If you're excited to help with animal conservation and use deep learning to achieve this, then you should apply! If you love to code and chat about research, then you'll have a great time!

### Value of award:

The fellowship is valued at R360,000 per annum. The award is compliant with the SARS rules for tax exemption and is tenable for two years, subject to submission of a satisfactory progress report and the availability of funds. Note that this is not a remote position, and the fellow will have to be present at AIMS South Africa for the duration of the fellowship. The fellow will be responsible for their living arrangements and visa application if needed.

**Application deadline:** 7th January 2024 AoE, two rounds of interviews conducted shortly thereafter.

**Start date:** 1st March 2024

### Applications must include:

1. A complete CV,
2. Proof of Ph.D. completion,
3. A covering letter detailing the candidate's experience (especially in deep learning for computer vision or audio), availability to start, and explain your interest in machine learning for bioacoustics. Propose a tentative research project and how you would address the research question. Cover letters should be aligned with the research group's interest.

Send your application as a single PDF file to [dufourq@aims.ac.za](mailto:dufourq@aims.ac.za). Only shortlisted candidates will be contacted for an online interview followed by a programming and analytical test. Contact Dr. Emmanuel Dufourq ([dufourq@aims.ac.za](mailto:dufourq@aims.ac.za)) for details regarding this position. Women are strongly encouraged to apply.

DISCLAIMER: AIMS South Africa reserves the right to disqualify ineligible, incomplete and/or inappropriate applications. AIMS also reserves the right not to make an appointment to the position as advertised or to extend the deadline for applications.

