



AIMS

**African Institute for
Mathematical Sciences
SOUTH AFRICA**

Postdoctoral Fellowship in Computer Vision for Ecology

Project title

Automatic behavioural identification of African Penguins from video recordings

Description of the host institution :

The African Institute for Mathematical Sciences (AIMS) is a pan-African network of centres dedicated to postgraduate training and research in the mathematical sciences (<https://aims.ac.za/>). Founded in Cape Town, South Africa, in 2003, AIMS supports scientific excellence and the development of scientific talent across Africa through education and research. The institute hosts several research groups and programmes in artificial intelligence, machine learning, and data science, including the AI for Science Master's programme developed in partnership with Google DeepMind.

The Machine Learning for Ecology Research Group is an interdisciplinary research group based at AIMS South Africa. The group develops machine learning and computer vision methods to address challenges in biodiversity conservation, wildlife monitoring, and ecological research. By combining advances in artificial intelligence with ecological expertise, the group aims to develop scientific tools that support wildlife monitoring and conservation across Africa and beyond.

AIMS South Africa is located in Muizenberg, a coastal suburb of Cape Town. The area offers easy access to outdoor activities and the natural landscapes of the Cape Peninsula, a region renowned for its rich biodiversity and abundant terrestrial and marine wildlife.

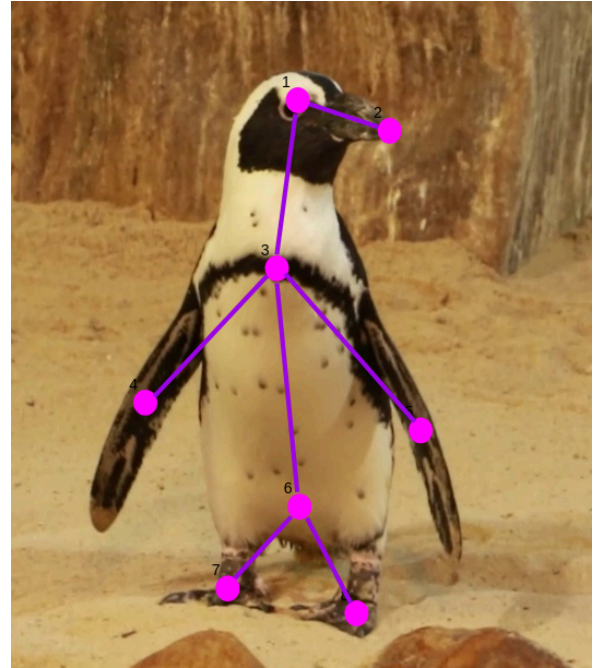
Research Project

The primary objective of this postdoctoral project is to develop computer vision methods for the automatic identification and classification of African penguin behaviours from video recordings. The project will involve the development of an end-to-end pipeline combining object detection, pose estimation, and behaviour classification.

Extensive datasets from captive and wild colonies have already been collected through collaborations with the Two Oceans Aquarium and the Dyer Island Conservation Trust. At the Two Oceans Aquarium, individual captive penguins have been filmed under controlled conditions, while custom Raspberry Pi camera systems have been deployed to continuously monitor the colony using wide-angle video recordings. A portion of these datasets has already been annotated through previous research projects. Additional data collection may be conducted if required.

The project will adopt a progressive approach, starting with controlled datasets from captive individuals before extending to more challenging recordings from wild African penguin colonies on Dyer Island. The long-term goal is to develop robust behaviour-identification tools that can be deployed in natural environments to support ecological monitoring and conservation efforts.

The project will be conducted in collaboration with the Two Oceans Aquarium and the Dyer Island Conservation Trust. The successful candidate will also work with Prof. Lorien Pichegru, Professor of Marine Biology at Nelson Mandela University, on the ecological and applied aspects of the project, including the deployment of behaviour-identification models and the formulation of associated ecological research questions. Depending on project progress, the research may explore applications related to animal welfare, behavioural monitoring, and conservation management in both captive and wild populations.



In parallel, the project will investigate the application of similar computer vision approaches to the automated monitoring of Cape fur seals. Seal colonies in South Africa are currently affected by an ongoing rabies outbreak, creating an urgent need for monitoring tools. The developed methods will be used to identify behavioural anomalies and potentially assist in the early detection of infected individuals. This component of the project will be conducted in close collaboration with Sea Search, a leading marine conservation organisation involved in monitoring seal populations and studying the spread of the disease. Beyond methodological advances in computer vision, this work therefore has the potential to contribute directly to wildlife conservation and disease surveillance efforts.

The successful candidate will be supervised by Dr. Lorène Jeantet, Principal Investigator and head of the Machine Learning for Ecology Research Group at AIMS South Africa, and co-supervised by Prof. Willie Brink, associate professor of Applied Mathematics in the Faculty of Science at Stellenbosch University. The candidate will be enrolled at Stellenbosch University while being primarily based at AIMS South Africa in Muizenberg, with regular interactions and occasional visits to Stellenbosch University.

Depending on their interests, the successful candidate may also contribute to teaching and capacity-building activities, including the Machine Learning for Ecology course and the supervision of Master's students undertaking research projects within the group.

Requirements

Applicants must hold a PhD in a field related to Computer Science, Artificial Intelligence, Machine Learning, with expertise in image or video analysis, computer vision, or video processing. The fellowship is only available to individuals who have achieved the doctoral degree within the past five

years. Experience with applications to ecology, biodiversity monitoring, animal behaviour, or wildlife conservation would be an advantage.

Applicants should demonstrate the ability to conduct independent research, lead a research project, publish high-quality scientific work, and contribute to an interdisciplinary research consortium. Strong programming skills and experience with modern deep learning frameworks are expected.

Duration and support

The fellowship is initially awarded for a period of one year. Subject to satisfactory progress, continued project needs, and the availability of funding, the fellowship may be renewed for a second year.

The successful candidate will have access to research support, including an additional amount of up to R40,000 for conference attendance and/or travel costs, awarded on motivation.

International applicants are welcome to apply. Stellenbosch University will provide supporting documentation for visa applications; however, visa costs and the visa application process remain the responsibility of the candidate. International candidates should allow approximately two additional months for the visa process.

Application Process

Applicants should submit a single PDF file including:

- a cover letter describing their motivation for the position, their relevant experience, and their research interests in relation to the project;
- a detailed curriculum vitae, including a list of publications, conference presentations, and software expertise;
- a copy of the relevant PhD thesis, if no publications have yet emerged from this work;
- a copy of the highest qualification certificate

Shortlisted candidates will be invited for an interview.

Applications should be emailed as a single PDF file to: lorene@aims.ac.za

Application deadline: 15 August 2026

Expected start date : January 2027

Work location: AIMS South Africa, 5-7 Melrose Road, Muizenberg

