Engineering and Physical Sciences Research Council Doctoral Landscape Award

PROJECT TITLE: AI and Computer Vision for High-Throughput Behavioural Monitoring in Wild Killer Whales

Lead Supervisor: Professor Darren Croft, D.P.Croft@exeter.ac.uk

Co-Supervisors:
Dr Sam Ellis (Exeter),
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Webpage: https://experts.exeter.ac.uk/436-darren-croft

Project details: How can we measure health in wild animals without capturing or disturbing them? Monitoring health is one of the biggest challenges in wildlife biology, particularly for long-lived, wide-ranging species such as whales. Traditional approaches, such as tissue sampling or rare opportunities to examine stranded or deceased individuals, offer valuable insights; however, these methods are limited in scope and often provide only snapshots rather than continuous assessments of health over time.

There is an urgent need for innovative, non-invasive methods that can track health in free-ranging populations with high precision and at scale. Behaviour offers a powerful window into health. Animals often adjust their behaviour in response to physiological state: immune responses, nutritional stress, or infection can lead to detectable shifts in activity, movement, and other behaviours. Crucially, these behavioural signals often appear before obvious signs of health decline, making them a sensitive early-warning indicator. Yet while the potential of behavioural indicators of health is well recognised, the tools to measure them rapidly and at scale in wild animal populations are still lacking.

This PhD project will address this challenge by developing AI and computer vision pipelines for rapid, high-throughput behavioural monitoring of individual killer whales in a critically endangered population. Working in partnership with the Center for Whale Research (USA), the student will utilise high-resolution drone video and large-scale longitudinal datasets to design and train algorithms capable of extracting health indicators such as respiration rates, movement patterns, synchronisation, and social interactions. This unique dataset will allow them to evaluate the performance of AI methods under real-world, noisy conditions, ensuring the tools are genuinely scalable and impactful. The work will be carried out in collaboration with Microsoft (Seattle, USA), which will provide access to state-of-the-art AI tools, cloud infrastructure, and industrial expertise.

The outcomes of this project will equip the student with a powerful skillset in AI, computer vision, and scalable data science, positioning them for careers across academia, industry, and the non-profit sector. Through the NGO partnership and collaboration with Microsoft, they will also gain first-hand experience of applied settings where advanced data science supports conservation decision-making, while benefiting from opportunities to learn directly from industry researchers to ensure the approaches developed are robust, transferable, and informed by best practice. Importantly, the work will also have direct impact on the study population, which is critically endangered, delivering new approaches to support conservation and recovery planning for this population.

Project specific entry requirements: Nothing above normal requirements

Potential PhD programme of study: PhD Psychology

Department: Psychology

Location: Washington Singer Building, Streatham Campus, University of Exeter

Please direct project specific enquiries to: Prof Darren Croft

Please ensure you read the entry requirements for the potential programme you are applying for.

To Apply for this project please click on the following link - **APPLY HERE**