Deep-learning computer vision for tracking animals with UAVs/drones

Modern UAV / drone technology offers a non-invasive approach to recording animals in the wild. In ecology, the current state of the art in animal tracking identifies animals by their contrast to the background. These methods are developed for use under laboratory conditions with a uniform white background and even lighting, and it is often impossible to detect animals from UAV footage in a natural habitat with a complex background using current methods. However, recent advances in deep machine learning have produced computer vision systems that can identify objects on any background and under varied conditions. As such, modifying and applying these new methods will allow us to study the collective behaviours of animals in their natural environments.

This project will make used of modern deep-learning computer vision methods, such as Mask R- to detect both positions of individuals and also generate a ‘segmentation mask’ that identifies which pixels belong to each individual. The project will address current weaknesses in the state-of-the-art algorithms and develop a new version of the method which will then be applied to real animal UAV footage of killer whales and banded mongooses.