Acoustic Signal Processing for Tracking Marine Mammals

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Abstract

Acoustics provides a useful tool to study various aspects of marine mammal biology, such as species identification, behaviour, habitat use, and abundance estimation. In order to answer these questions the acoustic information needs to be first extracted and processed from underwater recordings. This is a challenging task due to large volumes of data, noise and interfering signals present in the recordings. Moreover, multiple animals often vocalize at once, and their sounds are very diverse, further complicating the extraction and processing problem.

This seminar will focus on a tracking problem, from a perspective of whistle contour extraction and localization, where the goal is to simultaneously track multiple animals. This multi-target tracking problem will be addressed from a Bayesian perspective, and a non-traditional method that utilise random finite set statistics will be presented. Further it will be shown how these methods can be used to enhance abundance estimation of false killer whales in the Pacific Islands.