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Improving Odontocete Acoustic Tracking Performance Using More Informative Measures

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Wednesday, September 29
3:30 pm - 4:30 pm Seminar

Zoom Meeting ID: 935 9608 7383
Passcode: OREseminar

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Abstract

Passive acoustic monitoring (PAM) is a frequently used tool for various aspects of marine mammal research, including identifying species, their abundance and behavior. Traditionally, boat-based visual line-transect surveys are carried out with the goal of estimating species abundance. PAM is an important addition to visual surveys, especially for elusive species (in which groups are frequently missed by visual observers), species with complex group structure, and species that show behavioral response to boat presence. This seminar will discuss the challenging problem of tracking multiple false killer whale (*Pseudorca crassidens*) subgroups during line-transect surveys in the Hawaii Exclusive Economic Zone (EEZ). This delphinid species produces both narrowband whistles and broadband echolocation clicks. Due to significant differences in signal properties, animal tracking and localization is typically carried out separately based either on echolocation clicks or whistles, but generally not on both. However, since the types and rates of vocalizations depend on behavioral context, a separate analysis can limit the accuracy and amount of information extracted about a given acoustic encounter. We present a framework for joint multi-target tracking of both broadband and narrowband signals. We show that extending the measurement model to incorporate amplitude (in addition to timing) information and combining measurements from different call types can improve tracking performance. Our framework is suitable for tracking other biological and non-biological sound sources: examples and further applications to different array configurations will be discussed.

About the Speaker

Pina Gruden is a postdoctoral acoustic researcher at the Joint Institute for Marine and Atmospheric Research (JIMAR), Research Corporation of the University of Hawaii, USA. Her current research focuses on developing automated methods for multi-target tracking of underwater acoustic sources. She obtained her PhD in 2018 at the Institute of Sound and Vibration Research (ISVR), University of Southampton, UK. She has over 15 years of experience working in the marine mammal field worldwide for various research, governmental and industry institutions. In her work she adopts a multi-disciplinary approach incorporating acoustical engineering, signal processing, and machine learning with specialist knowledge of marine biology to find novel perspectives and innovative solutions to engineering and biological problems.

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