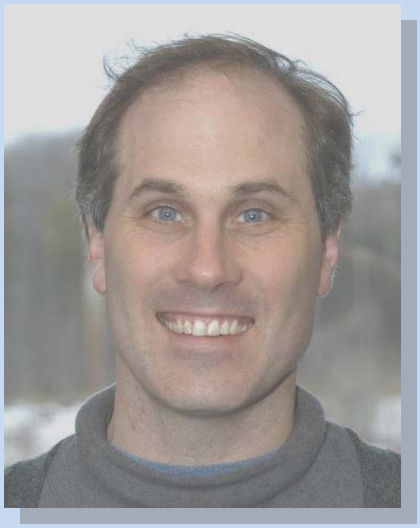
CoCo Seminar Series
Fall 2013

Listening to the World's Oceans

Searching for Marine Mammals by Detecting and Classifying Terabytes of Bioacoustic Data in Clouds of Noise



Peter J. Dugan, PhD
Bioacoustics Research Program
Cornell University

Wednesday November 20th, 2013, 8:30-9:30am
Biotechnology Building BI 2221 (ITC Conference Room)

Marine mammals are dependent on access to their normal acoustic habitats for basic life functions, including communication, food finding, navigation and predator detection. Cetaceans are adapted to produce and perceive a great variety of sounds that collectively span 4-6 orders of magnitude along the dimensions of frequency, time and space. Sounds from human activities, (vessel noise, energy exploration, commercial shipping) can result in measurable losses of marine mammal acoustic habitats; which drives the need for building technology capable of finding whale sounds in large databases of sounds. By converting sounds to pictures, using spectrograms, the human visual system is very good at finding whale calls and song, despite being inefficient and tedious for the human operator. This talk will focus on advanced developments in computer algorithm technologies designed to automatically find whale sounds in large datasets of acoustic recordings. Recent developments in advanced computing has allowed researches to unlock new information about marine mammals in large datasets. The authors will summarize specific examples, recorded in the Stellwagen Bank National Marine Sanctuary, MA, USA, for processing large quantities of continuous sound data using advanced detection-classification analytics. This talk will also combine the application of high-performance-computing (HPC) system to explore the spatio-temporal dynamics for a suite of acoustically active marine mammals (fin, humpback, minke, and right whales). The results yield insights into acoustic behavior for marine mammals with a goal to better help understand marine ecology for large cetaceans.

Dr. Dugan obtained his PhD in EECE at Binghamton University. His research topics include underwater acoustics, machine learning and pattern recognition.

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