

ELECTRICAL & COMPUTER ENGINEERING SEMINAR

“Acoustical monitoring of environmental status and trends”

by

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Abstract & Biography

Natural sounds present a discerning modality to monitor wildlife populations. Many animals can be heard and identified much more easily than they can be seen, and acoustical monitoring is inherently unobtrusive. Many ecological processes that are not intrinsically marked by sound (e. g. succession of vegetation) can be sensed indirectly through the responses of vocal animals that are affected. Accordingly, efficient instrumentation and software for acoustic monitoring will play important roles in managing natural resources and tracking climate change. Although progress has been made towards automatic detection, identification, and localization of wildlife sounds, this domain of engineering applications offers numerous opportunities for contributions that could transform environmental sensing and conservation. Another compelling motivation for acoustical monitoring is the increasing cacophony of transportation and other human noise sources. There is no systematic record of trends in noise pollution, and the effects of noise in protected natural areas are poorly understood. Collectively, these considerations present a trenchant argument for significant engineering effort to magnify the scale and scope of environmental monitoring through acoustics.

Kurt Fristrup is the senior scientist with the National Park Service Natural Sounds Program in Fort Collins, CO. His education includes an undergraduate degree in biomedical engineering from UCSD and a doctoral degree in evolutionary biology from Harvard. Prior to joining NPS, Dr. Fristrup enjoyed ten years in the Ocean Engineering and Biology Departments at Woods Hole Oceanographic Institution, followed by ten years as the Assistant Director of the Bioacoustics Research Program at the Cornell Laboratory of Ornithology. His research has involved environmental acoustic monitoring, wildlife responses to noise, automatic identification and localization of animal sounds, and wireless telemetry tags for environmental monitoring. His role with the National Park Service is to develop a national acoustic monitoring network, to provide scientific guidance for quantifying the impacts of noise, and to foster greater understanding and appreciation of acoustical environments among park visitors and the public at large.

The Natural Sounds Program (<http://www.nature.nps.gov/naturalsounds>) monitors the acoustical environments of National Park units to characterize the status of acoustic resources intrinsic to the unit and to help manage extrinsic noise sources that affect visitor experience and wildlife. Aircraft noise constitutes a large part of our work. We work with the Federal Aviation Administration and park unit staffs to develop air tour management plans, we support park analyses of the impacts of airport development projects near park units, and we work with DOD airspace planners to manage the effects of military overflights. Other forms of motorized vehicle noise are also monitored for management purposes: watercraft, roadway transportation, off road vehicles, over snow vehicles, and railroads. Other prominent program issues are assessing the acoustical impacts of resource extraction and land development near park units, and consulting with park units to help them manage noise associated with infrastructure and operations.

Please contact Prof. Branislav Notaros, notaros@colostate.edu, with any questions.