MODELING AUDITORY DETECTION OF COMPLEX SOUND SOURCES IN REAL SOUND ENVIRONMENTS

PROJECT DESCRIPTION: The human auditory system is remarkable in its ability to parse a sound scene into multiple sound objects. There are many computational models that are designed to simulate various aspects of the auditory system, but none yet that can satisfactorily predict the detectability of complex sounds in natural sound environments. In this project, we aim to develop a model that uses the statistics of auditory features and the change in those features that result from the addition of a new target sound to the environment to predict the detectability of that target sound in that environment, including effects of informational masking. This model will be useful for simulating object formation and identification within complex sound scenes. In order to develop a dataset for the model, behavioral studies with human listeners will be designed and conducted with our on-site panel of test subjects.

ACADEMIC LEVEL: Masters, PhD

DISCIPLINE NEEDED:
- Engineering
  - Bioengineering and Biomedical Engineering
  - Computer and Systems Engineering
  - Electrical and Electronic Engineering
- Social and Behavioral Sciences
  - Cognitive Science
  - Experimental Psychology
  - Linguistics

PREFFERED QUALIFICATIONS:
- The applicant should have some knowledge of the auditory system and acoustics.
- Previous experience with models of the auditory system is strongly desired.

RESEARCH LOCATION: Wright-Patterson AFB Dayton, OH

RESEARCH ADVISER: Eric Thompson, PhD
Applied Hearing Research, Technical University of Denmark, 2009

Dr. Eric Thompson is a research engineer with the Sensory Systems branch. His research interests include developing models of auditory and multisensory perception including signal detection, spatial hearing and communication.