

CATSS Newsletter - Center for Applied and Translational Sensory Science
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University of Minnesota: Driven to Discover

CATSS: Center for Applied and Translational Sensory Science

CATSS Newsletter
September, 2017

CATSS AT THE MINNESOTA STATE FAIR!

On August 30th, CATSS volunteers manned a table in the UMN Building at the State Fair. Various labs were represented, and outreach activities included general informational materials and handouts, giveaways, questionnaires on hearing loss, vision loss simulation goggles, cochlear implant simulations, and more.

MNStateFair2017



Center for Applied and Translational Sensory Science (CATSS) and Center for Cognitive Sciences (CCS) Jointly Awarded NSF Grant to Develop Interdisciplinary Graduate Training Program

University of Minnesota professors Victoria Interrante, Peggy Nelson, Andrew Oxenham and Gordon Legge were recently awarded nearly \$3 million from the National Science Foundation (NSF) for their project, "Graduate Training Program in Sensory Science: Optimizing the Information Available for Mind and Brain." Theirs is one of only 17 NSF Research Traineeship (NRT) projects to have been selected, from a pool of 220 applicants, to receive a portion of the \$51 million the NSF put forward to develop and implement bold, new graduate education in the STEM fields.

"At the University of Minnesota, our strength lies in interdisciplinary research," said Peggy Nelson, professor in the U of M's Department of Speech-Language-Hearing Sciences. "By receiving this grant from the National Science Foundation, we're able to build upon that strong foundation and foster even more cross-University collaboration to help develop effective technologies for people with sensory deficits, such as loss of hearing, vision or speech."

Granted jointly to the [Center for Cognitive Sciences](#), where Professor Interrante serves as Director, and CATSS, where Professor Nelson serves as Director, the award will enable their teams to initiate a new interdisciplinary graduate training program that unites basic sensory science (vision, audition, motor control, speech and language) with technical expertise in engineering, computer science and other related fields. Their research will explore the development of effective assistive technologies and therapies for people with sensory deficits-ultimately impacting an individual's quality of life.

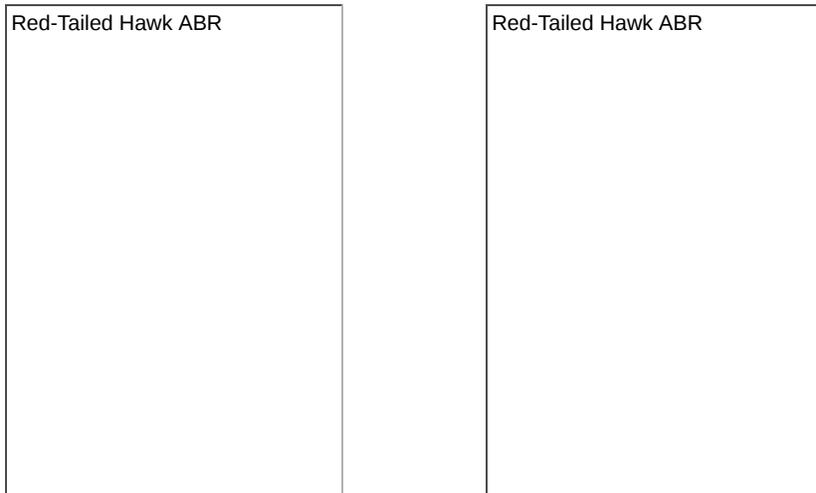
The program aims to serve up to 50 different Ph.D. students over five years, including six NSF-funded trainees per year from computer science, engineering, kinesiology, psychology and speech-language-hearing disciplines via courses, research opportunities, internships in the medical-devices industry and public outreach activities. Applicants must be US citizens or permanent residents, and should be in the second or third year of their Ph.D. and pursuing interdisciplinary research applicable to the development of assistive technologies for people with sensory deficits. Complete details on how to apply can be found at catss@umn.edu.

"Integration of research and education through interdisciplinary training will prepare a workforce that undertakes scientific challenges in innovative ways," said Dean Evasius, director of the NSF Division of Graduate Education, in the NSF's [press release](#). "The NSF Research Traineeship awards will ensure that today's graduate students are prepared to pursue cutting-edge research and solve the complex problems of tomorrow."

NEW FRONTIERS IN HEARING MEASUREMENT

This past summer, CATSS embarked on a new scientific venture: mapping the hearing abilities of bald and golden eagles. Jeffrey Marr (SAFL), Julia Ponder (Raptor Center) and Peggy Nelson (CATSS) met to discuss a Department of Energy (DOE) request for proposals around measuring the hearing of bald and golden eagles, for the purpose of mitigating eagle deaths near wind farms. The hearing thresholds of eagles has never been mapped, and it is possible that eagles do not hear the turbines as they approach wind farms in search of food. Immediately we recruited Edward Walsh and JoAnn McGee, animal psychophysicists from Boys Town National Research Hospital in Omaha. We successfully landed the grant, with funding for one year to measure eagle hearing.

During discussions with DOE personnel, it is apparent that their goal for the project is to develop audible (or visible) attractants or deterrents to keep eagles from flying into wind turbines. As our group discussed this long-term goal, we quickly recognized a number of challenges. Foremost among them is that raptor experts recognize that eagles have no natural predators and show no known aversion to any sounds. One idea, proposed by raptor experts, is that recordings of other eagles might serve as a deterrent, as they would respect eagle territorial calls. To that end, we have begun recording good quality eagle calls; we will use these in a series of behavioral observation tests with eagles in the Raptor Center.



Sedated red-tailed hawk completing non-invasive tests under the watchful care of expert veterinarians.

CATSS SUMMER INTERN EXPERIENCE

Logan Remington

By Logan Remington

After completing my first year of college, I started my internship in early June at CATSS and the Auditory Perception and Cognition Lab. I helped out with several projects that each covered its own unique aspect of psychoacoustics. At the Auditory Perception and Cognition Lab, I provided data analysis for a project that focused on the cognitive

roots of hearing variability in cochlear implant users, and I also helped create the final research poster. In CATSS, I focused primarily on two research projects. First, I provided some data analysis for a project involving infrasound and its effects on the human body. I also took some field measurements around campus of ambient infrasound levels.

In addition, I developed an augmented reality app for a project that seeks to expand current dynamic scene-analysis tasks by adding visual representations to the scene using augmented reality. I also created an online repository for CATSS that would allow future researchers to find interested research participants.

During my internship I was able to get tours of other research facilities on campus, including the SONIC Lab, a lab that focuses on sensory optimization and neural implant coding, and the Digital Design Consortium, a lab that aims to create new controlled environments using virtual reality. As a prospective biomedical engineer, this summer research internship has been the greatest opportunity for me to get experience in a research environment and learn more about the sensory sciences. There's no doubt that this research experience will lead to more academic and career opportunities in the future, and I'd like to thank everyone in CATSS and the Auditory and Perception Lab for being welcoming and for introducing me to the world of research!

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