IRES: US-China Collaboration: Bats as Model Organisms for Bioinspired Engineering

Applications are now being accepted for a NSF International Research Experiences for Students (IRES) award for a US-China Collaboration on Bats as Model Organisms for Bioinspired Engineering this summer (2017) at Shandong University, China. The program will support 5 students total, 3 graduate and 2 undergraduates, subject to availability of funds. Students from underrepresented groups, including women, are encouraged to apply.

Benefits:

- $5,000 stipend
- Travel, visa, lodging, subsistence covered (up to $5,000)
- At least $1,400 for small tools and supplies

Requirements:

- Must be US citizen or permanent resident
- Must participate in 3 preparatory seminar meetings, training by Global Education Office during the spring semester
- Must participate in 10-week long program during the summer (1 week preparation in Blacksburg, 8 weeks in China, 1 week wrap-up in Blacksburg)
- Preference for science and engineering majors

Application Process:

In order to be considered for the program, students must submit the following documents: (i) an essay describing the applicant's motivation, qualifications, and research interests, (ii) letters of recommendation (2 for undergraduates, 3 for graduates), (iii) unofficial transcript, and (iv) resume. All items should be submitted to the Principal Investigator, Dr. Rolf Mueller, via email: rolf.mueller@vt.edu.

Sample Research Projects:

Ecological Embedding: This project will focus on producing quantitative engineering characterizations of the ecological and evolutionary context of biosonar sensing, bat flight, and neural control.

Interface Mechanisms: In this project, the IRES scholars will investigate the physical and physiological basis of sound emission and reception in horseshoe bats and Old World leaf-nosed bats.

Dynamic Biosonar Sensing: Student projects focusing on sensory information encoding for unstructured natural environments will study the active biosonar behaviors of bats, especially the dynamics in the emission and reception baffle shapes (noseleaves and pinna) and their relationship to the emitted and received ultrasonic wavefields.

Aerial Maneuverability: Student projects in the project of flapping flight will be based on the acquisition of high-resolution, occlusion-free data on the kinematics of bat flight.

Powerful Yet Parsimonious Control: In this project, students will conduct recordings of neural activities of bats during biosonar or/and flight behaviors.