RUTGERS

Robust Speech Processing in Human Auditory Cortex

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Columbia University

Thursday, November 21, Fiber Optics Auditorium and Atrium

12:00 Main lecture: "Robust Speech Processing in Human Auditory Cortex"
1:30 Open Classroom: "How does the brain represent and compute natural speech?"
3:30 MIND Network Event (Mentoring to Improve Neuroscience Diversity)

Abstract: The brain empowers humans with remarkable abilities to navigate their acoustic environment in highly degraded conditions. This seemingly trivial task for normal hearing listeners is extremely challenging for individuals with auditory pathway disorders, and has proven very difficult to model and implement algorithmically in machines. In this talk, I will present the result of an interdisciplinary research effort where invasive and non-invasive neural recordings from human auditory cortex are used to determine the representational and computational properties of robust speech processing in the human brain. These findings show that speech processing in the auditory cortex is dynamic and adaptive. These intrinsic properties allow a listener to filter out irrelevant sound sources, resulting in a reliable and robust means of communication. Furthermore, incorporating the functional properties of neural mechanisms in speech processing models greatly impact the current models of speech perception, lead to human-like automatic speech processing technologies, and creates new opportunities for speech brain-computer interfaces.

Speaker Bio: Nima Mesgarani is an associate professor of Electrical Engineering at Columbia University. He received his Ph.D. from University of Maryland where he worked on neuromorphic speech technologies and neurophysiology of mammalian auditory cortex. He was a postdoctoral scholar in Center for Language and Speech Processing at Johns Hopkins University, and the neurosurgery department of University of California San Francisco before joining Columbia in fall 2013. He was named a Pew Scholar for Innovative Biomedical Research in 2015, and received the National Science Foundation Early Career Award in 2016.

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