



PROGRESS IN NEUROSCIENCE PINS

Seminar Series of the
Brain & Mind Research Institute
Weill Cornell Medical College (WCMC)
&

The Graduate Program in Neuroscience of
WCMC and Sloan Kettering Institute

Thursday, 10/23/14, 4 PM, coffee at 3:45 PM
Weill Auditorium



Reverse Engineering the Neural Mechanisms Involved in Robust Speech Processing

Nima Mesgarani, Ph.D.
Assistant Professor, Electrical Engineering
Columbia University

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 results of an interdisciplinary research effort where reverse-engineering methodologies are used to determine the computation and organization of neural responses in human auditory cortex leading to new biologically informed models incorporating the functional properties of key neural mechanisms. The neural responses are recorded invasively from electrodes surgically implanted on the cortical surface of epilepsy patients, providing a highly detailed view of the neural activity. A better understanding of the neural mechanisms involved in speech processing can greatly impact the current models of speech perception and lead to human-like automatic speech processing technologies.

Recent relevant publications:

1. N. Mesgarani, S. David, J. Fritz, S. Shamma (2014), "Mechanisms of noise robust representation of speech in primary auditory cortex", Proceedings of the National Academy of Sciences
2. N. Mesgarani, C. Cheung, K. Johnson, E. Chang (2014), "Phonetic feature encoding in human superior temporal gyrus", Science, 1245994
3. N. Mesgarani, E. Chang, (2012) "Selective cortical representation of attended speaker in multi-talker speech perception", Nature 485: 233-236



Weill Cornell Medical College

