ELECTRICAL & COMPUTER ENGINEERING **RESEARCH SEMINAR** **Spring 2018**

The Cortical Interface Between Vision and Language

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Friday, April 6, 2018, 2:00pm – 2:50pm, Location: BB 3.03.24

Abstract

Voxel-wise encoding models predict brain responses to stimuli in a two-stage process. First, stimuli are transformed into some feature space. Second, the feature space representation is used to predict responses separately in each voxel. Encoding model performance is then assessed using held-out data. In this talk I will discuss how encoding models using different feature spaces can be compared to determine which feature spaces best match representations in the cortex. In particular, I will focus on representations of language.

Biography

Alexander Huth is an assistant professor of Neuroscience and Computer Science at the University of Texas at Austin. His research uses computational methods to model how the brain (measured using fMRI) processes language and represents meaning. He's also interested in fMRI technology and data visualization. In 2016, he wrote a paper about how the meaning of language is represented in brain activity, where he showed how models based on semantic properties of words can do surprisingly well at predicting fMRI responses to naturally spoken, narrative stories. Then he analyzed those models to determine which kinds of semantic properties are represented in which brain areas, creating detailed maps of semantic representation across the human cortex. To produce a group atlas from these data, he developed a generative model of cortical maps. Dr. Huth also showed that pretty much all of the higher visual cortex is semantically selective, and argued that this representation is better understood as gradients of selectivity across the cortex than as distinct areas. He did his PhD and postdoc in Dr. Jack Gallant's laboratory at UC Berkeley through the Helen Wills Neuroscience Institute at UC Berkeley. Before that, he got both bachelor's and master's degrees in computation and neural systems (CNS) at Caltech. During his master's, he worked in Dr. Christof Koch's laboratory.