1 Abstract and title of my talk

1.1 Title

The title of my talk is *Bayesian modeling of complex-valued fMRI signals.*

1.2 Abstract

Voxel fMRI time courses are complex-valued signals giving rise to magnitude and phase data. Nevertheless, most studies use only the magnitude signals and thus discard half of the data that could potentially contain important information. Methods that make use of complex-valued fMRI (f(c)MRI) data have been shown to lead to superior power in detecting active voxels when compared to magnitude-only methods, particularly for small signal-to-noise ratios. We present a complex-valued EM variable selection algorithm that leads to fast detection at the voxel level in f(c)MRI slices and also consider full posterior inference via MCMC. Model performance is illustrated through extensive simulation studies as well as detecting active voxels in human f(c)MRI data from a healthy individual who performed unilateral finger tapping in a designed experiment. An MCMC algorithm with spatial structure is also developed.

2 Biography

Cheng-Han Yu is a PhD student in Statistics and Applied Mathematics at University of California, Santa Cruz, advised by Dr. Raquel Prado. Before studying in California, he received a master degree in Economics and was in a PhD program in Statistics at Indiana University Bloomington.

Cheng-Han's current research focuses on Bayesian spatio-temporal modeling and Bayesian variable selection with applications in brain imaging, especially complex-valued functional magnetic resonance imaging (fMRI) data. He is also in the space-time research group of Professor Hernando Ombao at University of California, Irvine. His other interests include Bayesian nonparametrics, variational inference and data visualization.

3 Webpage

Webpage link: `https://chenghanyu.github.io/index.html`