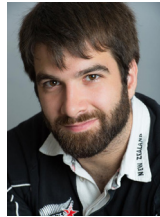




**BIO**  
**MATH**

Ph.D. Dissertation Defense Seminar

# Developing and Integrating Computer-Aided Diagnostic Tools into Clinical Medicine



**Wesley Kerr**

Doctoral Graduate Student  
Department of Biomathematics  
UCLA

**Tuesday, March 31, 2015**

**2:00 PM**

**MacDonald Research Lab (MRL) 1-441**

**ABSTRACT:**

This thesis is comprised of two parts (1) development of unimodal and multimodal computer-aided diagnostic tools (CADTs) for seizure disorder and (2) a novel method for optimization of hyperparameters in machine learning models. The aims of CADTs are to address key challenges in the diagnosis and treatment of seizure disorder, including reducing the time to an accurate diagnosis, improving the sensitivity and specificity of diagnostic neuroimaging, and the understanding of the diagnostic value of interictal scalp electroencephalography. Our novel method for optimizing hyperparameters has the potential to slightly improve the accuracy of machine learning models, while substantially increasing the interpretability of learned estimates and reducing computational cost.

**Doctoral Committee:** Mark S. Cohen, Ph.D., Henry Huang, D.Sc.,  
Elliot M. Landaw, M.D., Ph.D., Marc A. Suchard, M.D., Ph.D., John M. Stern, M.D.