Statistical Methods in Imaging Conference

June 5-7, 2018 at the University of Pennsylvania

June 5, 2018

R Hack-A-Pack Event

8:30-9:00	**Breakfast** (provided)
8:45-9:00	**Introduction to hackathon, presentation of the space and schedule**
9:00-9:45	**Lightning talks & tutorials**
9:45-10:00	**Coffee break**
10:00-10:30	**Project pitches**
10:30-10:45	**Team organization**
10:45-12:45	**Open hacking**
12:45-1:30	**Bag Lunch** (provided)
1:30-3:00	**Open hacking**
3:00-3:20	**Project updates**
3:20-5:30	**Open hacking**
5:30-7:00	**Briefings & beers**

June 6, 2018

8:30-9:00	**Breakfast** (provided)
9:00-10:00	**Overview of Imaging Statistics in R** *John Muschelli, PhD (Johns Hopkins University)*
10:00-11:00	**Brain Connectivity and Parcellation** Organizer: Amanda Mejia, PhD Bayesian spatial binary regression for label fusion in structural neuroimaging *Andrew Brown, PhD (Clemson University)* Template ICA: Identifying Brain Networks in Individual Subjects using Empirical Big Data Priors *Amanda Mejia*, PhD *(Indiana University)* Likelihood Based Dynamic Connectivity Analysis using Hidden Semi-Markov Models *Heather Shappell*, PhD *(Johns Hopkins University)*
11:00–11:30	**Coffee Break**
11:30-12:30	**Statistical Methods for Clinical Imaging: Three Case Studies** Organizer: Ciprian Crainiceanu, PhD Consideration on Causal Inference in 4D Flow MRI for Bicuspid Aortic Valve Patients *Adin-Cristian Andrei, PhD (Northwestern University)* Radiomics and imaging of the lung and breast *Nichole Carlson*, PhD *(University of Colorado)* Dynamic prediction of MS lesions: a case for joint functional and survival modeling of voxel trajectories *Ciprian Crainiceanu*, PhD *(Johns Hopkins University)*
12:30-1:45	**Lunch** (provided)

1:45-2:45 **Multimodal Imaging and Reduction Techniques**
Organizer: Dana Tudorascu, PhD

Multimodal Prediction of Beta Amyloid Load from MRI Brain Images
Using Structured Sparse Regression
Joanne Beer, MS (University of Pittsburgh)

Global PCA of Local Moments with Applications to MRI Segmentation
Jake Maronge, MS (University of Wisconsin)

An Integrative Model for Assessing Multimodal Neuroimaging Signatures of
Posttraumatic Stress Disorder
Zoe Zhang, PhD (Drexel University)

2:45-3:15 **Hackathon Report**

3:15-3:45 **Coffee Break**

3:45-4:45 **Collaborative Case Study: Background Parenchymal Enhancement in Breast MRI**
Organizer: John Kornak, PhD

Significance of Breast MRI Background Parenchymal Enhancement for
Predicting Response to Chemotherapy
Vignesh A Arasu, MD (University of California, San Francisco)

Statistical analysis of MRI of the Breast in the Presence of Background Parenchymal Enhancement
John Kornak, PhD (University of California, San Francisco)

5:00-7:00 **Poster Reception**

June 7, 2018

8:30-9:00 **Breakfast** (provided)

9:00-10:00 **Analysis and Processing of Complex-Valued MRI**
Organizer: Benjamin Risk, PhD

Statistical impacts of reconstruction method in simultaneous multislice acquisition of MRI
Benjamin Risk, PhD (Emory University)

Bayesian image analysis in Fourier space for Medical Imaging
John Kornak, PhD (University of California, San Francisco)

Bayesian Spatial Modeling via Kernel Convolutions on Complex-Valued fMRI Signals
Cheng-Han Yu, PhD (University of California, Santa Cruz)

10:00-11:00 **Student Awards Presentations**

11:00-11:30 Coffee Break

11:30-12:30 **Collaborative Case Study: Quantitative Immunohistochemistry Biomarkers based on Tissue Microarray Images**
Organizer*: Inna Chervoneva*, PhD

Quantitative immunohistochemistry biomarkers for precision oncology
Hallgeir Rui, MD, PhD (Medical College of Wisconsin)

Spatial statistics approach to develop novel protein cancer biomarkers
Inna Chervoneva, PhD (Thomas Jefferson University)

12:30-1:45 **Lunch** (provided)

1:45-2:45 **Recent Advances in Modeling Large-Scale Imaging Data**

Organizer: Zoe Zhang, PhD

A time-varying AR, bivariate DLM of functional near-infrared spectroscopy data
Timothy Johnson, PhD (University of Michigan)

A hierarchical independent component analysis framework for longitudinal fMRI analysis
Ying Guo, PhD (Emory University)

NPBayes-fMRI: Nonparametric Bayesian General Linear Models for Single- and Multi-Subject fMRI Data
Jeong Hwan Kook (Rice University)

2:45-2:55 **Brief Break**

2:55-3:35 (session continued)

Efficient semi-parametric regression for longitudinal data with regularized estimation of error covariance function
Chunming Zhang, PhD (University of Wisconsin-Madison)

Sparse Multivariate Mediation and Moderated Mediation Analysis
Seonjoo Lee, PhD (Columbia University)

3:35-4:00 Panel Discussion (details TBD)