

Kieran Mace

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EXPERIENCE

PhD Candidate – El-Samad lab September 2012 - Present

- Used outlier detection with linear models to identify condition specific kinase interactions in adaptive gene expression.
- Developed an algorithm to classify regulatory topologies in signaling cascades using bioengineered circuitry.
- Created an online tool, backed by neural networks, to predict cycle cycle from bright-field microscopy.
- Engineered a synthetic gene circuit to dynamically modulate the mean and variance of a gene's expression.

Analyst – Venn Diagnostics Summers 2014 & 2015

- Predicted profitability for 16,000 potential clients, leading to enriched sales targeting, and a 4% increase in profit.
- Built forecasting algorithm for clients water and electricity usage. Allowing for accurate tariff selection.
- Developed data acquisition tools for physical capture, with statistical validation of fields.

Research Associate – Bonneau Lab & Littman Lab – New York University September 2010 – July 2012

- Developed an inference method for imputation of next-generation sequencing data.
- Built a predictive model of immune cell differentiation by reverse engineering its underlying gene regulatory network.
- Developed two tools for visualization and analysis of intersection bioinformatic data (Java and R).

Software Developer Intern – Bloomberg May 2010 – September 2010

- Joined software developer bootcamp, covering data structures, UX design, databases, and OO programming.
- Created dashboard to monitor the number of function calls made to various services across Bloomberg's data centers.

Research Assistant – Collins Lab - Center for BioDynamics – Boston University May 2009 – May 2010

- Engineered synthetic genetic circuits to introduce metal sensitivity to the bistable genetic toggle switch in bacteria.

EDUCATION

University of California – San Francisco, CA

Ph.D September 2012 - Present

Majors: Bioinformatics and Complex Biological Systems GPA: 4.0 HHMI International Student Fellow

Boston University College of Engineering – Boston, MA

Bachelor of Science May 2010

Major: Biomedical Engineering GPA: 3.7 Cum Laude

PUBLICATIONS

- **K Mace***, D Pincus, H El-Samad
Residual analysis identifies condition specific kinase signaling under stress - In review
- A Bonny*, **K Mace***, D Pincus, H El-Samad
HOG1 plays a coordination role in carbon trafficking under osmotic stress - In preparation
- R Bhatnagar*, A Aranda-Diaz*, **K Mace***, H El-Samad
Identifying crosstalk topology with inducible gene expression systems - In review
- A Aranda-Diaz*, **K Mace***, I Zuleta, P Harrigan, H El-Samad
Robust synthetic circuits for two-dimensional control of gene expression in yeast - **ACS Synthetic Biology** 2016
- M Ciofani*, A Madar*, C Galan, M Sellars, **K Mace**, F Pauli, A Agarwal, [...], RM Myers, R Bonneau, DR Littman
A validated regulatory network for Th17 cell specification – **Cell** 2012.

SKILLS

Computer Languages: R (8 years), Python (5 years), Bash/Linux (10 years), SQL, C++, Java, MATLAB (each 2 years)

Data Analysis Methods and Concepts: Unsupervised learning [PCA, SVD, t-SNE], Linear Regression, Neural Networks (Tensorflow), Signal Processing/Time series analysis (Holt-Winters, ARIMA, Fourier/Laplace analysis), Feature Selection, Dimensionality Reduction, Regularization, Cross Validation, Probabilistic Graphical Models, Bayesian Inference.

OS/Deployment: AWS, Ubuntu Server, Rocks distributed cluster, LSF and SGE batch job systems.

Frameworks, Libraries, and Tools: git, hadoop, cuda, cudnn, tidyverse, shiny, tensorflow, scikit-learn, ggplot2, plotly

Bioinformatic Analysis Methods and Concepts: Genomics, Differential Expression analysis, Systems biology.

ACTIVITIES AND AWARDS

Kaggle: 20th place (out of 598) in 2016 March Madness Learning Mania Competition March 2016

Science: HHMI International Student Fellowship (~50 Students out of ~1000 each year) March 2014

Rowing: South African national champion and record holder. February 2005

Sailing: 2nd place in the transatlantic Cape to Rio international yacht race. January 2006