

Rick Farouni | Curriculum Vitae

Massachusetts General Hospital/Harvard Medical School

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I am currently a post-doctoral research fellow in computational biology, working in the lab of Dr. Pinello at the Massachusetts General Hospital/Harvard Medical School. My research is focused on the application of multivariate statistics, machine learning, and deep learning to epigenomics and CRISPR data in particular, and bioinformatics data, in general. I received a PhD in Quantitative Psychology (statistics applied to modeling psychological and neuroimaging data) and a master's degree in Mathematical Statistics from the Ohio State University. I am dedicated to rigorous science in the public interest and I am passionate about the open access movement in science.

Experience

Postdoctoral Research Fellowship

- **Massachusetts General Hospital/Harvard Medical School** **MA, USA**
Research Lab of Professor Luca Pinello, Molecular Pathology Unit 06/2017

Internship

- **The Department of Biomedical Informatics Summer Internship Program (BMI SIP)**
Research Lab of Professor Ewy Mathè, The Ohio State University 2016
Project: Developing an R package and a Shiny app for the analysis of data generated from genome-wide chromatin accessibility assays such as ATAC-seq and DNase-seq with the goal of identifying regulatory elements involved in the cancer epigenetic landscape.

Teaching Experience

- **Graduate Teaching Associate** **Ohio, USA**
The Ohio State University 2013–2017
Served as a Teaching Assistant for three courses: Repeated Measures Models, Covariance Structure Models, and Data Analysis in Psychology.

Education

Academic Qualifications

- **The Ohio State University** **Ohio, USA**
PhD in Quantitative Psychology 2015–2017
Dissertation Topic: 'Application of Deep Latent Generative Models to the Unsupervised Learning of Chromatin States'

- **The Ohio State University** **Ohio, USA**
Master of Science in Statistics *2012-2014*
- **The Ohio State University** **Ohio, USA**
Master's Degree in Quantitative Psychology *2012-2014*
 Thesis Project: '*Latent Variable Modeling of Categorical Item Responses in a Hierarchical Bayesian Framework*'
- **The Pennsylvania State University** **Pennsylvania, USA**
Bachelor's Degree in Psychology with High Distinction *2011-2012*

Conference Presentations

- **Joint Statistical Meetings** **Seattle**
Poster Presentation *2015*
Poster Title: Across-Subject Predictive Modeling of fMRI BOLD Responses to Faces using a sparse Bayesian Group Factor Analysis Model

Awards and Fellowships

- **Graduate Student Conference Presentation Award**
The Ohio State University *2015*
- **The Center for Cognitive and Brain Sciences Summer Graduate Fellowship**
The Ohio State University *2015*
Project Proposal: '*Decoding the Pixels of the Face Image from the Voxels of fMRI BOLD Activity Patterns*'
- **The Social and Behavioral Sciences Summer Fellowship**
The Ohio State University *2014*
- **University Fellowship**
The Ohio State University *2012*

Technical Skill Set

- **Statistics and Machine Learning**
 - **Scientific Programming Languages:** Proficient in and comfortable transitioning between *R*, *Python* depending on computing goals. Familiar with *Julia*.
 - **Deep Learning Frameworks:** Experienced in using Tensorflow and Keras.
 - **Probabilistic Programming Languages:** Proficient in Stan.
- **Bioinformatics Software**
 - Experienced in analyzing Next Generation Sequencing (NGS) and functional genomics data using R's Bioconductor set of tools, Bowtie2, MACS2, and bedtools.
- **Cluster and High-Performance Computing**

- Good knowledge of running neuroimaging and bioinformatics analysis pipelines on super-computing clusters.
- o **Web and Software Development Tools**
 - L^AT_EX, Linux OS, Git, Docker, and Bash. Basic knowledge in website development tools such as HTML, CSS, and Jekyll.

Publications and Software

Journal Papers.....

- o Baskin, E., Farouni, R., and Mathè, E. (2016). ALTRE: workflow for defining ALTerred Regulatory Elements using chromatin accessibility data. **Bioinformatics** doi: 10.1093/bioinformatics/btw688. Preprint available at <http://www.biorxiv.org/content/early/2016/10/14/080564.full.pdf+html> (first co-author)
- o Pinello, L., Farouni, R., and Yuan, G-C. (2017). Haystack: systematic analysis of the variation of epigenetic states and cell-type specific regulatory elements (under review) doi: 10.1101/199067. Preprint available at <https://doi.org/10.1101/199067>

Preprints.....

- o Farouni, R. (2017). A Contemporary Overview of Probabilistic Latent Variable Models. **arXiv preprint**. Preprint available at <https://arxiv.org/abs/1706.08137>

Software Development.....

- o ALTRE: A Workflow for Identifying ALTerred Regulatory Elements using Chromatin Accessibility Data. GitHub Repo: <https://github.com/Mathelab/ALTRE>.
- o Haystack: systematic analysis of the variation of epigenetic states and cell-type specific regulatory elements. GitHub Repo: https://github.com/pinellolab/haystack_bio.

Journal Review Service.....

- o **Psychometrika**
Ad Hoc Reviewer 2015
- o **Psychological Methods**
Ad Hoc Reviewer 2016