Fatma Uyar Morency

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PhD, Data Scientist

Summary

Experienced neuroscientist with a proven track record of success in leading research projects. Leveraging expertise in *behavioral analytics*, *statistics* and *ML* towards a Data Science career.

Experience

2016 - 2018 ***Research Scientist,*** **Carnegie Mellon University**

- Managed research projects under Army Research Lab funding, delivered findings on brain connectivity explaining individual variability in cognitive performance under sleep pressure.
- Created Predictive Flow Algorithm which utilizes machine learning to build a graph model for relationship between brain regions based on neural activity (R^2 ~0.8); extending over state-of-the-art approaches for brain connectivity analysis.
- Overhauled automated pipeline to gather and preprocess neuroimaging data: 800+ participants, 220 temporal scans, 200K data point per scan (~ 1 TB); built test cases uncovering systematic errors in datafile handling and image coordinate systems.

2014 - 2016 ***Post-doctoral Researcher,*** **University of Pittsburgh**

- Established parallelization of data preprocessing pipelines, resulting in 800% speed up in analysis of MRI images across multiple datasets (weight loss, Parkinson's, childhood obesity).
- Discovered causal links between fitness, aspects of brain health and cognitive function using statistical methods (i.e. mediation analysis).

2014 - 2015 ***Instructor,*** **Center for Neural Basis of Cognition**

- Developed 6-weeks course to train graduate students, postdocs and faculty (US and international fellows) in advanced brain imaging techniques and machine learning for fMRI.

2011 - 2013 ***Associate Researcher,*** **George Washington University**

- Directed and executed a complete human subject research study: designing experimental protocol, recruiting participants, overseeing MRI center procedures and statistical analysis.
- Classified neural activity of brain regions using SVM to access the impact of visual attention deficits; demonstrated increased classification accuracy post stroke rehabilitation.

Education

2008 - 2013 **Ph.D.,** Materials Science and Engineering, **Carnegie Mellon University**

2010 Computational Neuroscience Summer School, **University of Ottawa**

2006 - 2008 **M.S,** Materials Science and Engineering, **Carnegie Mellon University**

2002-2006 **B.S.,** Materials Science and Engineering, **Sabanci University**

Skills

Languages Python, Matlab, SPSS, R, unix scripting, C++, SQL

Tools Jupyter Notebook, pandas, matplotlib, numpy, scikit-learn, Tableau

Statistics Hypothesis testing, multiple corrections, General Linear Model, ANOVA, mediation analysis

ML Feature engineering, PCA, LASSO, multilayer perceptron, SVM, linear regression/classification

Projects

BrainHeart Predicting heart disease risk markers with brain activity during stress tasks (PCA-LASSO)[Reuters]

StrokeSignal Classification of visual cortex neural signals from attention-blind stroke patients (SVM) [Poster]

Publications

2018 **Predictive Flow Model of Resting-State Functional Network and Structural Constraint Analysis**, Fatma Uyar Morency, Javier O. Garcia, Jean M. Vettel, and Timothy Verstynen [in prep.]

2018 **Associations Between Cardiorespiratory Fitness, Physical Activity, Intraindividual Variability and Cingulate Cortex in Younger Adults,** Joao Bento-Torres, Chelsea M. Stillman, George A. Grove Jr., Haiqing Huang, Fatma Uyar, Jennifer C. Watt, Marigold E. Wollam, Kirk I. Erickson *[in prep.]*

2018 **Cardiorespiratory Fitness Is Associated with Enhanced Hippocampal Functional Connectivity in Healthy Young Adults,** Chelsea M. Stillman, Fatma Uyar, Haiqing Huang, George A. Grove Jr., Jennifer C. Watt, Mariegold E. Wollam and Kirk I. Erickson. ***Hippocampus***

2017 **A Brain Phenotype for Stressor-Evoked Blood Pressure Reactivity,** Peter J. Gianaros, Lei K. Sheu, Fatma Uyar, Jayanth Koushik, J. Richard Jennings, Tor D. Wager, Aarti Singh, Timothy D. Verstynen. ***Journal of American Heart Association***

2016 **Retinotopic Information Interacts with Category Selectivity in Human Ventral Cortex**
Fatma Uyar, Sarah Shomstein, Adam S. Greenberg, Marlene Behrmann. ***Neuropsychologia***

2016 **Physical Activity Is Associated with Reduced Implicit Learning but Enhanced Relational Memory and Executive Functioning in Young Adults,** Chelsea M. Stillman, Jennifer C. Watt, George A. Grove Jr., Marigold E. Wollam, Fatma Uyar, Maria Mataro, Neal J. Cohen, Darlene V. Howard, James H. Howard, Kirk I. Erickson. ***PLOS One***

2013 **Sensory Processing with Varying Degrees of Attention: Lessons from Hemispatial Neglect,** Sarah Shomstein, Fatma Uyar, Adam S. Greenberg, Marlene Behrmann. ***Journal of Vision***

2012 **Simulation of Grain Growth under the Effect of Stress,** Fatma Uyar, Seth R. Wilson, Myrjam Winning, Anthony D. Rollett. ***Materials Science Forum***

2009 **Testing a Curvature-Driven Moving Finite Element Grain Growth Model with the Generalized 3-D von Neumann Relation,** Fatma Uyar, Seth R. Wilson, Jason Gruber, Sukbin Lee, Stephen Sintay, Anthony D. Rollett, David J. Srolovitz. ***International Journal of Materials Research***

2008 **Testing the MacPherson-Srolovitz Theory in Simulations of 3-D Grain Growth,** Anthony D. Rollett, Fatma Uyar, Seth R. Wilson, Jason Gruber, Sukbin Lee. ***Bulletin of the American Physical Society***

Presentations

October 2012 **Sensory Processing with Varying Degrees of Attention: Lessons from Hemispatial Neglect**
Poster Presentation, Society for Neuroscience Conference, New Orleans, LA

February 2010 **Tissue Development in Arabidopsis: 3-D Shape Analysis for Automated Detection of Cell Type**
Poster Presentation, The Minerals, Metals and Materials Society Meeting, Seattle, WA

October 2009 **Stagnation of Thin Film Grain Growth Under the Effect of Stress**
Invited talk, Materials Science and Technology Conference, Pittsburgh, PA

February 2009 **Effect of Stress on Grain Boundary Network**
Oral Presentation, Computational Materials Science Network Meeting, San Francisco, CA

March 2008 **Application of Mean Width to 3-D Materials Science**
Oral Presentation, The Minerals Metals Materials Society Conference, New Orleans, LA

April 2006 **PVP Micellar Nanoreactors for Blue-Luminescent ZnO Quantum Dots**
Poster Presentation, Materials Research Society Conference, San Francisco, CA

Honors and Awards

2010 University of Ottawa Computational Neuroscience Summer School Fellowship

2006 - 2011 Carnegie Mellon University Graduate Student Fellowship

2002 - 2006 Sabanci University High Honor Full Tuition Scholarship

2002 Ranked **27th** among **1,489,351** in the Turkish National University Entrance Exam