



Fatma Uyar Morency

PhD, Research Scientist

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Education

- 2006 - 2013 **Carnegie Mellon University**
M.S, Ph.D., Materials Science and Engineering,
- 2010 **University of Ottawa**
Computational Neuroscience Summer School
- 2006 - 2008 **Sabanci University**
B.S., Materials Science and Engineering

Experience

- 2016 - 2018 **Research Scientist, Carnegie Mellon University**
- ◆ Created Predictive Flow Algorithm which utilizes machine learning to build a graph model for relationship between brain regions based on neural activity ($R^2 \sim 0.8$), extending over state-of-the-art approaches for brain connectivity analysis.
 - ◆ Developed automated pipeline to process and analyze Human Connectome Dataset, one of the largest datasets for brain neuroimaging: 800+ participants, 220 temporal scans, 200K data point per scan (~ 1 TB); built test cases to ensure data extraction quality control.
- 2014 - 2016 **Post-doctoral Researcher, University of Pittsburgh**
- ◆ Created multi-threaded parallel pipeline to analyze brain MRI images across multiple datasets (weight loss, Parkinson's, childhood obesity); speeding up processing by 800%.
 - ◆ Applied statistical mediation analysis to uncover causal links between fitness, aspects of brain health and cognitive function.
- 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**
- ◆ Executed a complete human subject research study: designing experimental protocol, recruiting participants, overseeing MRI center procedures and statistical analysis (ANOVA)
 - ◆ Classified neural activity of brain regions using SVM to assess the impact of visual attention deficits; demonstrated increased classification accuracy post stroke rehabilitation.

Skills

- Languages** Python, Matlab, SPSS, R, unix scripting, C++, SQL
- Tools** Jupyter Notebook, pandas, matplotlib, numpy, scikit-learn
- Expertise** Behavioral data and medical image analysis using statistical and machine learning methods

Projects

- PredictFlow** Utilizing machine learning for brain functional Connectivity [[GitHub](#)]
- BrainHeart** Predicting heart disease risk markers with brain activity during stress tasks [[Github](#)] [[Reuters](#)]
- StrokeSignal** Classification of visual cortex neural signals from attention-blind stroke patients [[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, Marigold 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