


Shady El Damaty, M.Sc. | Ph.D.

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Neuroscientist trained in multimodal neuroimaging, behavioral science, and machine learning techniques. Intellectual interests are honed in on the development of mechanistic biophysical models of human behavior derived from empirical neural dynamics underlying decision-making from perception to action. Currently exploring software development challenges in decentralized data marketplaces to support open science.

Current Activities

- **Opscientia PTE. LTD.** #14-04 Singapore Business Federation Centre, Singapore
Founder & Director *Founded 1 January 2021*
 - Private limited company building Web 3.0 marketplaces for tokenized datasets, scientific apps, algorithmic models, and scholarly research papers. Services include consulting and software infrastructure for launching decentralized autonomous organizations executable on distributed cloud public networks and smart contract blockchains.



Education & Training

- **Georgetown University** Washington, DC
Ph.D. Neuroscience *1 Jul 2013 - 23 Nov 2020*
 - **Dissertation:** *Cognitive Skills and Neural Systems Maturation Mediates Paths to Altered Social Norms and Vulnerability in Emerging Adulthood*
A Neurocognitive Maturity Index derived from multi-contrast Magnetic Resonance Imaging and neuropsychological task performance is introduced and applied to tracking developmental trajectories in developing adolescents and predicting future life outcomes in adulthood.
 - **Qualifying Exam:** *A Balancing Act: Lexical System Design & Communication Rate Capacity*
 - Roles and Experiences :**
 - NIH T-32 **fellowship trainee** from 2013 to 2015
 - High performance computing **data engineer** and **systems administrator** from 2016 to 2020
 - **Principal investigator** on National Institute of Justice (NIJ)-funded dissertation grant to study impact of community violence on brain maturity to predict future antisocial behavior and generate augmented youth violence-prevention metrics. from 2017 to 2020
- **Drexel University, School of Biomedical Engineering** Philadelphia, PA
M.Sc. in Biomedical Science; Neuroengineering *Sep 2011 - Sep 2013*
 - **Master's Thesis:** *Cohort-Selective Gamma Rhythms Filtered from Intracranial Electroencephalogram Signals Support Hierarchical Visual Processing During Word Recognition*
 - Roles and Experiences :**
 - Independent study in mathematical neuroscience on neural field modeling for design and guiding of implantation of deep-brain stimulation electrodes in Winter-Spring 2013.
 - **Research assistant** in neurosurgical epilepsy research unit.

- **Software developer** for visualization of electrode placement and spectrographic analysis of signals recorded directly from the human brain from 2011 to 2012.

- **University of Rochester** Rochester, NY
B.Sc. in Neuroscience 2007 - 2011
 - **Research assistant** in bio-organic chemistry lab. Designed synthetic pathway using cytochrome P450 as a regioselective catalyst to synthesize three novel derivatives of the notoriously chemically delicate anti-malarial drug, artemisinin from 2008 to 2010.

Consulting Experience & Materials

- **Rapid Prototyping Air Foils for Precision Air Drops** Dash Systems
Contracted Research Fellow (NDA) Aug 2019 - Jun 2020
- **Empathy as a Pedagogical Tool** Deedly
Contracted Neuroscience Expert Feb 2019
 -  **El Damaty, S.** Primer on Literature Supporting Empathy for Enhancing Pedagogy.
- **Rewiring the Brain for Peace** Alliance for Peace
Cognitive Neuroscience Research Associate Jan 2017 - Jun 2018
 -  **El Damaty, S.** Methods Development & Ethical Issues. Published [online](#). Nov 2017.

Awarded Grants & Funding

- **Pattern Classification of Neurocognitive & Socio-Emotional Developmental Factors Underlying Violent Outcomes in Adolescents**

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| National Institute of Justice | U.S. Department of Justice: Office of Justice Programs |
| Award Amount: \$150,000 | 2016-CX-0019-R2 |
| Funding Active: May 31 2016 - 2020 | DUNS# 049515844 |
- **Mistletoe Unfettered Research Grant & Startup Collaboration**

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| Mistletoe Foundation |
| Award Amount: \$10,000 |
| Funding Active: July 14 2019 - 2020 |
- **Georgetown University Gender⁺ Justice Initiative Research Grant**

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| Gender Justice Initiative |
| Award Amount: \$4,000 |
| Funding Active: June 2019 - 2020 |

Grants Submitted

- **Modeling Developmental Deviations in Social, Emotional and Cognitive Factors Underlying Violent Outcomes in Adolescence**

Harry Frank Guggenheim Dissertation Research Fellowship
Award Amount: \$20,000
Status: Submitted 1 Feb 2019, Rejected 15 June 2019

- Tracking Internal Affective States with Functional Magnetic Resonance Imaging During Emotional Film Viewing for Determining Bio-social Health & Cognitive Emotional Development

Medical Center Graduate Student Organization Student Research Grant Program
Award Amount: \$5,000
Status: Submitted 19 Apr 2019, Rejected 10 July 2019

International & Local Invited Seminars

- El Damaty, S. *Tracking Post-Pubertal Lifespan Trajectories with Neuroimaging*. Kennedy Krieger Institute at Johns Hopkins University. Baltimore, MD. Jul 2018.
- El Damaty, S. *Multimodal Cartography of the Striatum*. University of Melbourne. Melbourne, Australia. Jun 2018.
- El Damaty, S. *Multimodal Cartography of the Striatum*. Deakin University. Melbourne, Australia. Jun 2018.
- El Damaty, S. *Multimodal Cartography of the Striatum*. Melbourne Children's Research Institute. Melbourne, Australia. Jun 2018.
- El Damaty, S. *Neuroimaging for Predictive Sociodemographics: Violence Prevention*. Cognitive Neuroscience Workshop. Universidade Federal do Rio Grande do Sul. Porto Alegre, Rio Grande do Sul. Feb 2018.

Peer-Reviewed Publications

- El Damaty, S., Darcey, V., McQuaid, G., Stoianova, M., Fesalbon, M., Mucciarone, V., Van Hecke, K., Rose E.J., Fisbein, D.H., VanMeter, J. (2020, October 26). Introducing an Adolescent Cognitive Maturity Index and Tracking Vulnerability in Emerging Adulthood. *Journal of Developmental Psychobiology* [under review]. <https://doi.org/10.31234/osf.io/6uwrp>.
- El Damaty, S., Chun Y., McQuaid, G., Stoianova, M., Fesalbon, M., Mucciarone, V., Van Hecke, K., Rose E.J., Fisbein, D.H., VanMeter, J. (2020, Nov 10). Social-Strain in Adolescence Cascades into Violence Experience and Altered Social Norms in Emerging Adulthood. [submitting]
- El Damaty, S., Rose E.J., Fisbein, D.H., VanMeter, J. (2020, Nov 20). Multi-scale Parcellation of the Adolescent Striatum. [submitting]
- El Damaty, S., V.,M., Mucciarone, Stoianova, M., Fesalbon, Rose E.J., Fisbein, D.H., VanMeter, J. (2020, Dec 12). Developmental Trajectories of Cortical Thickness are Confounded by Age-Related MRI Quality Variance. [submitting]
- Darcey, V. L., El Damaty, S., Rose, E. J., Fishbein, D. H., and VanMeter, J. W. (2016). *DHA status is related to prefrontal cortex-mediated impulse control in adolescents*. *The FASEB Journal*, 30, 407-3.


- Van Hecke, K., **El Damaty S.**, Martin, K., McQuaid G., Darcey, V.L., Rose, E.J., Fishbein, D.H., and VanMeter, J.W. *Altered Resting State Functional Connectivity Predicts Adolescent Drug Use*. [in prep]
- Viacava, K.R. **El Damaty S.**, Stevens, B.W., Rose, E.J., Fishbein, D.H., and VanMeter, J.W. *Awareness of Alcohol Advertising and Limbic-Frontal Activations During an Emotional Counting Stroop Task in Adolescents*. [internal review]
- **El Damaty**, S. Wahedi L., and VanMeter, J.W. *Modulating Bargaining Behavior in the Ultimatum Game Using Subliminal Affective Visual Primes*. [submitting]
- **El Damaty**, S. and Maguire, J. *A Neural Architecture for Unsupervised Temporal Pattern Recognition*. NIPS. 2016. [rejected, resubmitting]
- Zhang, K., **El Damaty**, S. and Fasan, R. (2011) *P450 Fingerprinting Method for Rapid Discovery of Terpene Hydroxylating P450 Catalysts with Diversified Regioselectivity*. *J. Am. Chem. Soc.*, 133 (10), pp 3242–3245.

Conference Papers & Presentations







- 📄 El Damaty, S., Fishbein, D.H., and VanMeter, J.W. *Estimating Brain Maturation in Developing Adolescents with Multicontrast MRI*. Organization for Human Brain Mapping. Rome, Italy. Jun 2019.
- 📄 El Damaty, S., Fishbein, D.H., and VanMeter, J.W. *Multi-scale Intrinsic Functional Connectivity of the Striatum in Developing Adolescents*. Organization for Human Brain Mapping. Singapore, Singapore. Jun 2018.
- El Damaty, S., Fishbein, D.H., and VanMeter, J.W. *Painting Dynamic Cartograms of the Developing Striatum with Resting State fMRI from the Adolescent Development Study*. Flux Satellite Conference: Big Data Little Brains. Chapel Hill, NC. May 2018.
- 📄 El Damaty, McQuaid G., S. Martin, K., Darcie, V.L., Fishbein, D.H., and VanMeter, J.W. *Intrinsic Functional Connectivity of the Striatum in Developing Adolescents*. Computational Cognitive Neuroscience. New York, NY. Sep 2017.
- Viacava K.R., El Damaty S., Stevens B.W., Leiser J., Rose E.J., Fishbein D.H. & VanMeter JW. *Awareness of Alcohol Advertising and Limbic-frontal Activations During an Emotional Counting Stroop Task in Adolescents*. Society for Neuroscience. Chicago, IL. Nov 2016.
- El Damaty, Shady & Martin, Kelly & McQuaid, Goldie-Ann & Darcie, Valerie & Rose, Emma J.L., & Fishbein, Diana and John Vanmeter. *Functional Connectivity Predicts the Emergence of High Violence Proneness in Developing Adolescents*. Flux Congress. St. Louis, MO. Sep 2016.
- Vanmeter, John & El Damaty, Shady & Martin, Kelly & McQuaid, Goldie-Ann & Darcie, Valerie & Rose, Emma J.L. and Fishbein, Diana. *Adolescent Substance Use Predicted by Pre-use Differences in Functional Connectivity*. Flux Congress. St. Louis, MO. Sep 2016.
- Darcie, Valerie L., & El Damaty, Shady, Fishbein, Diana, Rose, Emma J., and John Vanmeter. *DHA Status is Related to Prefrontal-Cortex Mediated Impulse Control in Adolescents*. Experimental Biology. San Diego, CA. Apr 2016.

- El Damaty, Shady & James Maguire. *Temporal Pattern Recognition with a Time Delay Neural Network*. 30th Annual Machine Learning Conference at the New York Academy of Science. New York, NY. Mar 2016.
- El Damaty, Shady & Wahedi, Laila and John Vanmeter. *Priming Behavior in the Ultimatum Game with Subliminal Affect*. Society for Neuroscience. Chicago, IL. Oct 2015.
- 📄 Wahedi, Laila & El Damaty, Shady and John Vanmeter. *Priming Emotions to Dissociate Affective Contributions to Decision Making in the Ultimatum Game*. Organization for Human Brain Mapping. Honolulu, HI. Oct 2015.

Pre-Registered Experiments

- **An fMRI Film Paradigm for Inducing Affective States** Open Science Framework
Principal Investigator 2019
 Project Repository

Open Source Projects & Contributions

- **IPFS for Massive Neuroimaging Datasets** Global Brain Hack-a-Thon
Project Lead 2020
 Project Repository
- **mICA Toolbox** Neuroimaging Tools & Resources Collaboratory
Code Contributor 2020
 Project Repository
- **Amplenaunts** Ampleforth: A New Synthetic Commodity
Code & Community Contributor 2020
 Amplenaunts Community Repository
- **Surfer-Gems** Automated FreeSurfer web-reports
Developer 2018-19
 Template Repository
- **FreeSurfer New User Training** Quantitative Onboarding
Developer 2018-19
 Training Dataset and Protocol
- **Google Cloud Webhooks** Github Add-On
Developer 2017-18
 Code Repository

Teaching Experience & Materials

- **Summer Coding & Brain Imaging Camp** Georgetown University Medical Center
Course Instructor May 2017 - Aug 2017

FreeSurfer Summer Workshop

- **Core Foundations in Neuroscience I** Georgetown University Medical Center
Graduate Teaching Assistant Aug 2017 - Jan 2018
 - Guided Tutorial on the Biophysical Foundations of Neural Electrophysiology
- **Drugs Brain & Behavior** Georgetown University Medical Center
Graduate Student Instructor 16 February 2017
 - Injury & Recovery of the Central Nervous System
- **Drugs Brain & Behavior** Georgetown University Medical Center
Graduate Student Instructor 26 March 2015
 - Injury & Recovery of the Central Nervous System
- **Core Foundations in Neuroscience I** Georgetown University Medical Center
Graduate Teaching Assistant Aug 2014 - Jan 2015
 - Biophysical Foundations of Neural Electrophysiology
 - Introduction to CNS Motor Systems
 - Introduction to Cognitive Neuroscience
- **Aerospace Summer STEM Camp** NASTAR Center
Graduate Student Instructor Jun - Aug 2012

Awards & Honours

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| Neuroscience Program Superlative Award in Rigor and Reproducibility | 2019 |
| Georgetown Medical Center Graduate Student Research Day 1 st Place Presentation | 2017 |
| Georgetown Graduate School of Arts & Sciences Travel Award | 2017,18 |
| Georgetown Medical Center Graduate Student Organization Travel Award | 2017,18 |
| National Science Foundation Modeling Developmental Change Travel Award | 2017 |
| Georgetown Graduate School of Arts & Sciences Travel Award | 2015 |
| New York Academy of Science Graduate Student Trainee | 2014-2017 |
| Association for the American Advancement of Science Graduate Student Trainee | 2014-2017 |
| Georgetown University Medical Center NIH T32 Graduate Training Fellow | 2013-2015 |
| Drexel University Dean's Fellowship | 2011-2013 |
| German Academic Exchange Service RISE Professional Internship (<i>did not accept</i>) | 2013 |
| Meliora Weekend Student Showcase | 2010 |
| 1 st Place SURF Oral Presentation Competition | 2010 |
| Summer Undergraduate Research Fellowship | 2010 |
| University of Rochester Chemistry REU Program | 2009 |
| McNair Post-Baccalaureate Achievement Program | 2008-2011 |

Skills & Certifications

Grant Writing & Management

- 6+ yeas of experience writing, revising and submitting government and foundation grants
- Have served as reviewer on student-run study sections

Project Management

- Establishing timelines & adaptively shifting to meet milestones
- Budget management, projection & balancing
- Personnel organization, mentoring & task delegation
- Quality control & productivity monitoring
- Conflict resolution & team management
- Performance reviews & progress reports

Experimental Design & Execution for Human Subjects Research

- Neuropsychological testing in both child & adult participants, including but not limited to: IQ testing, cognitive and perceptual experiments, mental health screeners, parent interviews
- Design, validation & fielding of cognitive neuroscience experiments
- Experienced in participant recruitment from high-risk (high violence/poverty) neighborhoods
- Experienced in building bridges with community leaders for engagement in research & dissemination of results.

High Performance Scientific Computing & Programming

- 20,000+ lines of UNIX shell code
- 15,000+ lines of MATLAB code for neural network, signal processing & statistics
- 5,000+ lines in R statistical programming language
- 2,500+ lines of python code
- Adept in C++
- Adept in HTML/Java for web design & development
- Familiar with SQL, Snowflake, BigQuery
- Extensive experience in UNIX system administration
- Built, fine-tuned and fielded high performance compute cluster from basic components
- Knowledgeable in cloud computing services (Google, Amazon, Digital Ocean)
- Experienced in working with large databases (20TB+), including but not limited to: processing, archiving, distribution, sharing and versioning.
- Highly proficient in database management, version control and infrastructure for collaboration and data distribution using datalad, cloud services and git
- Knowledgeable in XPP for dynamical systems models
- Knowledgeable in NEURON for biophysical models of neuron dynamics

Statistical Analytic Skills

- Completed two course certifications on design and power analysis for longitudinal studies

- General Linear Model (GLM) and related derivatives, including mixed effects models
- Regularized regression models & predictive algorithms
- Time series analysis
- Data reduction & projection into low dimensional spaces

Neuroimaging Techniques

- Operation of Siemens Prisma magnetic resonance scanner (3 Tesla)
- Design and quality control of magnetic resonance pulse sequences for human brain
- Safety training certification for magnetic resonance imaging of human participants
- Experienced in EEG data collection and analysis
- Experienced in electrocorticographic data acquisition with Neuralynx and signal processing
- Experience collecting and analyzing physiological cardiovascular measurements

Scientific Writing

- Extensive experience writing scientific protocols, instructions for technical and general audiences

Graphic Design & Data Visualization

- Proficient with Inkscape & Illustrator
- Extensive experience working with custom color palettes, 3d renderings, and reduction/projection of high dimensional data for concise yet interpretable data visualization