

Matthew Fam

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Data scientist, developer, and researcher with extensive professional experience in industrial and academic settings. Strong aptitude for rigorous inquiry, backed by training in experimental and observational research, statistics, and machine learning. Skilled programmer, with a history of engineering optimized, scalable architectures and production-ready solutions. Visualization expert, well-versed in complementary aspects of web, UI, UX, branding/identity, and accessible design. Constantly learning new skills and capable of adopting new technologies. Responsible communicator with a talent for visual and verbal storytelling, able to cater to technical and non-technical audiences alike.

Education

Dartmouth College

Hanover, NH

BA in Neuroscience (with Honors) & English (Creative Writing Concentration Modified with Middle Eastern Studies)

June 2021

Senior Honors Thesis: Comparing decoding approaches for classifying musical genres from blood-oxygen-level-dependent functional magnetic resonance imaging

Activities: Russian Advanced Language Study Abroad (St. Petersburg and Moscow), Shadowing (Neurosurgery [Pediatric and General/Functional], Neurology, Epileptology, Interventional Radiology, Orthopedic Surgery), Thought Project Living Learning Community, Club Soccer

Honors & Awards: Jesse and Amanda Bullock 1904 Memorial Scholarship, James Monroe Mathes 1911 and James Monroe Mathes, Jr. 1939 Memorial Scholarship

Courses: Introduction to Neuroscience, Introduction to Computational Neuroscience, Cognition, Behavioral Neuroscience, Systems Neuroscience, Brain Mapping with fMRI, Honors Neuroscience Research I & II, Introduction to Data Analysis, Introduction to Calculus, Calculus of Functions of One and Several Variables, Cell Structure & Function, Gene Expression & Inheritance, Honors General Chemistry, Organic Chemistry I & II, Biological Chemistry

Staten Island Technical High School

Staten Island, NY

Advanced Regents Diploma with Honors

June 2017

Activities: Columbia University Science Honors Program (Neuroscience—Exploring the Brain; Relativity & Quantum Mechanics), Varsity Soccer, Christian Seekers Club (Treasurer)

Honors & Awards: National Honor Society, National Merit Finalist, AP Scholar with Distinction, Olympiad in Russian Language Gold Medalist, 2x National Russian Essay Contest Bronze Medalist

Experience

Merck & Co., Inc

Rahway, NJ (hybrid)

Developer/Analyst

January 2022 - Present

- Produce and validate predictive, statistical models (i.e., regressions, machine-learning models, and neural networks) to forecast automation value and inform high-stakes investments.
- Build intuitive, informative, and aesthetic data-driven dashboards to facilitate leadership discussions, support decision-making, empower an Agile methodology of software development, and democratize data for 100+ new users, including executives, customers, engineers, and scrum personnel.
- Prepare and present key performance indicators (KPIs) instrumental in boosting value delivery and productivity by ~50% via actionable insights.
- Design robust extract, transform, load (ETL) pipelines to connect, track, report, and visualize enterprise data encompassing business finances worth \$65M+ per annum and a portfolio of services valued at \$100M+ per annum.
- Develop data solutions to integrate disparate, external data sources via application programming interfaces (APIs)—enriching insights and ensuring data integrity.
- Optimize and automate scripts to enhance reporting accuracy and efficiency, reducing data-related labor by more than 90% and improving runtime/computational load by more than 100x, despite growing data volume.
- Consult on best practices for enterprise data systems, data governance, process engineering, workflow design, reporting, and analytics.

Dartmouth College

Hanover, NH

Presidential Scholar

June 2019 - June 2021

- Planned, completed, and defended an honors thesis (dissertation and poster)—assessing machine learning methods for predicting musical genre from listeners' brain activity—under the guidance of faculty from the Departments of Psychological & Brain Sciences, Computer Science, and Music.
- Studied interactive alignment—as seen in conversation, comedy, shared storytelling, group decision-making, attention, and social networks.
- Formulated and tested hypotheses within an exploratory analysis of social datasets, utilizing rigorous statistical methods (i.e., correlations, linear regressions, mixed models, analysis of variance [ANOVA], principal component analysis [PCA], latent profile analysis [LPA], structural equation modeling [SEM], k-means clustering, and social network analysis/graph theory [i.e. centrality measures]).
- Employed advanced data analysis and visualization techniques to discover, interpret, and present nuanced patterns of correlation and causation.
- Reviewed scientific literature; prepared internal and external presentations on study methods and findings; contributed to study design alongside graduate students; and provided constructive feedback for ongoing studies, data interpretation, and data visualization at laboratory meetings.
- Coded experimental audio recordings to identify relevant features for data analysis.

Dartmouth College

Hanover, NH

Undergraduate Advisor

January 2020 - June 2021

- Fulfilled responsibilities as a campus security authority (CSA) while supporting student health, wellness, and safety by linking residents to campus resources and complying with established reporting procedures.
- Actively created a sense of inclusion and unity among residents of all backgrounds and identities.
- Promoted a safe and respectful atmosphere with transparency, open communication, mutual understanding, and shared expectations.
- Assessed the needs of residents, working to satisfy those needs by briefing supervisors and coordinating with residential staff.

Massachusetts General Hospital

Boston, MA

Harvard Orthopedic Trauma Initiative Intern

September 2019 - December 2019

- Compared outcomes of operative and non-operative Achilles tendon rupture treatment.
- Studied virtual reality intervention for post-operative pain management in inpatient orthopedic trauma settings, alongside opioid administration.
- Collected relevant health data on demographics, comorbidities, treatments, outcomes, and drug administrations from the electronic health records of more than 60 study participants and recorded this information in secure, study databases.
- Reviewed medical images (x-rays and computerized tomography [CT] scans) and classified bone fractures according to Association of Osteosynthesis (AO)/Orthopedic Trauma Association (OTA) classification guidelines, prior to confirmation by an orthopedic surgeon.
- Screened, consented, surveyed, and instructed patients daily, coordinating with their healthcare providers and research teams to ensure optimal care, proper study implementation, and ethical research execution.
- Recruited more than 150 study participants by phone, mail, email, and in-person within 3 months.
- Reviewed literature and participated in manuscript writing, editing, and submission.
- Observed orthopedic operations, including hemi- and total hip arthroplasties.

Icahn School of Medicine at Mount Sinai

New York, NY

Laboratory Assistant

January 2019 - March 2019

- Conducted research on neuronal morphology in youth and adolescents with Prader-Willi Syndrome—sectioning, preparing, staining, and performing stereological analysis on human brain tissue in addition to observing cellular structures using light and fluorescence microscopy, storing tissue samples, aiding with immunohistochemical assays, and working with macaque brain tissue.
- Systematically wrangled, aggregated, and analyzed data on synaptic structure from ~30k dendritic spines spread across more than 100 cells of Shank3-deficient rats.
- Reviewed relevant scientific literature and participated in manuscript writing and editing.
- Maintained clear and exhaustive notes on protocols and observations for later reference.
- Adhered to strict laboratory safety procedures regarding chemical use and waste while preparing buffers and other solutions, handling/manipulating biological samples, and running assays.

Dartmouth College

Hanover, NH

Enrolled Note-Taker

September 2018 - November 2018

- Maintained clear, exhaustive, concise, and organized notes on evolutionary neuro-anatomy, computational neuroscience, machine learning, and artificial intelligence to aid a student with a documented disability in a college course.
- Communicated in a timely manner—sending notes and addressing questions/concerns within 24 hours—while protecting the student's privacy.

New York City Department of Health & Mental Hygiene

Long Island City, NY

Natural Language Processing Intern

July 2017 - August 2017

- Analyzed public perception of the homeless population, effect of immigration policies on healthcare access, and mental health trends amongst residents of New York City.
- Consulted on applications of natural language processing for predicting health needs and measuring social or medical impacts of public policy across New York City.
- Assessed the efficacy of sentiment analysis performed on social media content to identify healthcare gaps and disparities amongst racial and socioeconomic populations within New York City.
- Compiled social media posts on relevant topics from social media data using tailored queries, filters, and commands.
- Trained machine learning software to classify and quantify affective quality of hundreds of thousands of social media posts.

Geographic Information Systems Intern

July 2016 - August 2016

- Compiled public census data to map the socioeconomic makeup of New York City in relation to mental illness and social determinants of health.
- Prepared intuitive, informative, and accessible data-driven visualizations for departmental use in exploring epidemiological trends.
- Linked demographic data with geographical data to create an interactive atlas of more than 250 neighborhood tabulation areas.
- Calculated, derived, organized, and documented data for transparency, application, and exploration.
- Established the foundation of a project for which a new, full-time employee would be hired.

Citywide Assistance Team Intern

July 2016

- Learned about the history, law, and enforcement of the Assisted Outpatient Treatment Program.
- Observed how legal and public health policy ensure the safety of the public and those living with mental illness, all while reducing associated stigma.
- Handled and protected confidential information while adhering to privacy protocols.

- Studied the effects of prenatal stressors and diets on social and behavioral tendencies in a mouse model of autism.
- Maintained and handled live colonies of BTBR and C57 mice, including feeding, tagging, and monitoring.
- Prepared experimental apparatuses and conducted behavioral exams, using tracking software to record data on mouse behavior.
- Maintained clear, concise, and regular records of experimental procedures, observations, and data for later reference.

Publications

Journal Articles

Altered synaptic ultrastructure in the prefrontal cortex of Shank3-deficient rats

Sarah Jacot-Descombes, Neha U. Keshav, Dara L. Dickstein, Bridget Wicinski, William G. M. Janssen, Liam L. Hiester, Edward K. Sarfo, Tahia Warda, Matthew M. Fam, Hala Harony-Nicolas, Joseph D. Buxbaum, Patrick R. Hof, Merina Varghese

Molecular autism 11.1 (2020) pp. 89–89. BioMed Central Ltd, 2020

Conference Proceedings

Comparing Centrality and Behavior in Online vs. In-Person Social Networks

Matthew Fam

Society for Personality and Social Psychology Convention (Intragroup Processes Preconference), 2022, San Francisco, CA (hybrid remote)

The Plague and Its Funny Side

Matthew Fam

39th Annual Medieval and Renaissance Forum, 2018, Keene, NH

Leadership & Service

Eichler Leaders in Health Care Fellow	The Dartmouth Institute for Health Policy & Clinical Practice
Dartmouth Global Health Fellow	The Dickey Center for International Understanding
Undergraduate Advisor	Dartmouth College — Office of Residential Life
Thought Project Student Coordinator	Dartmouth College — Living Learning Communities
Nathan Smith Society Executive Committee	Dartmouth College — Student Organizations
Sunday School Teacher (3rd-6th Grade)	Coptic Orthodox Church of St. Mark
Bible Study Teacher (Pre-K-2nd Grade)	Coptic Orthodox Church of St. Mark
Reader (2nd Rank of Diaconate)	Coptic Orthodox Church (General)
Hartford Autism Regional Program Volunteer	Hartford School District
Patient Support Corps Volunteer	Dartmouth-Hitchcock Medical Center
Students Teaching in the Arts Volunteer	Hopkins Center for the Arts

Skills

Programming	Python (pandas, NumPy, scikit-learn, matplotlib, asyncio, HTTPX, etc.), R (ggplot2, plotly, dplyr, tidyr, tidyverse, stringr, knitr, glmnet, neuralnet, lme4, car, etc.), HTML/CSS, JavaScript, SQL, MATLAB, PHP
Software	Microsoft 365 (Word, PowerPoint, Excel, Power BI, SharePoint, & Power Apps), TIBCO Spotfire (GUI, IronPython API, & CLI), OpenSearch/Elasticsearch, Kibana, Jira (GUI & API), Confluence (GUI & API), ArcGIS, Crimson Hexagon, REDCap, Epic EHR, UiPath (Orchestrator & Insights), AutoCAD (Certiport certified), Adobe Creative Cloud (Acrobat Pro DC, Photoshop, Illustrator, & InDesign), Final Cut Pro
Miscellaneous	Git, Unix Command Line, Shell (Bash/Zsh), High Performance Computing (HPC), Agile Methodology, CPR/First Aid
Soft Skills	Creative Problem-Solving, Teamwork, Communication, Initiative, Adaptability, Prioritization, Time Management, Documentation

Languages

English	Native proficiency
Arabic	Native proficiency
Russian	Conversational proficiency
Spanish	Beginner proficiency
Coptic	Reading proficiency