

Alexander Verbitsky

EDUCATION

Georgia Institute of Technology

M.S. in Computer Science

Atlanta, GA

Graduation: 2023

The Pennsylvania State University

B.S. with Honors in Engineering Science, Minors in Engineering Mechanics and Biomedical Engineering

University Park, PA

2018

SKILLS

Technologies: Python (NumPy / SciPy / scikit-learn / pandas / matplotlib / PySpark / TensorFlow / Keras / Pytorch), MATLAB, Java, C++, RDBMS / SQL, AWS, ImageJ, Amira, Tableau, Git

Industry Knowledge: NLP / text mining, Data wrangling, MLOps, Software Engineering, Algorithm design, Data analysis/visualization, Statistical analysis, Rapid prototyping, Design of experiments. *Other:* Fluent in Russian, Marathon runner

PROFESSIONAL EXPERIENCE & RESEARCH

Senior Data Scientist / Machine Learning Engineer, Netrias

Jan 2021 - Present

- Lead and execute life science machine learning projects with academic, government, and industry partners
- Accelerate an ultrasound video pleural line segmentation and classification platform that achieves 93% test accuracy in pneumothorax detection and 95% for Covid-19. Assist in software product deployment
- Improve a machine learning framework that integrates phenotypic assays to predict bacterial pathogenicity to 90% accuracy for unknown bacteria with a test harness using scikit-learn and custom models. Establish a method to fail datasets with reproducibility issues before downstream analysis, helping researchers improve experiment duplicability
- Architect an entity segmentation and harmonization framework, using a sequence-to-sequence natural language processing model for correction that achieves 100% accuracy on new representations of in-dictionary terms and > 95% out-of-dictionary
- Develop data generator models to synthesize data based on existing data, reducing scientists' experimental workloads by 3x
- Lead white papers, proposals, and technical demonstrations, networking with potential clients at conferences and trade shows

Data Scientist, Sanofi

May 2019 - Jan 2021 (Full-time), - Present (Part-time)

- Automate image data wrangling, mining, and analysis with machine learning and AI, used by the whole bioimaging team to discover hidden patterns, curate data, and expedite reporting
- Develop an interactive AI-driven end-to-end brain region, bone structure, and retina layer segmentation system with U-Net
- Design and develop a web application for study scheduling, planning, and data storage using SQL
- Acquire and analyze data from optical imaging, OCT, MRI, micro-CT, PET, and ultrasound scans of 2,000+ animals
- Plan experiments, work in an Agile collaborative environment, and troubleshoot technical problems with imaging devices

Computer Vision Engineer, Translational Neuroimaging and Systems Neuroscience Lab

Aug 2016 - May 2019

- Developed imaging preprocessing algorithms for motion correction, segmentation, and data visualization in MATLAB
- Implemented and validated predictive statistical models to examine inheritance and treatment of stress disorders
- Designed, executed, and interpreted preclinical experiments to investigate stress phenotypes in 200+ rodents using behavior tests, enzyme immunoassays, and awake functional imaging (fMRI) in a 7-Tesla Bruker scanner
- Analyzed rodent microbiomes using genomics and 16s RNA sequencing
- Designed and fabricated a quadrature radiofrequency birdcage coil. Built circuits to integrate the coil and MRI

Teaching Assistant, The Pennsylvania State University

Jan 2015 - May 2019

- Courses: Computational Methods, Mechanical Response of Materials, Strength of Materials, Intro. to Engineering Design
- Facilitated team projects and delivered lectures to help students learn programming, SolidWorks, and rapid prototyping

Research Assistant, Mechanics and Materials Lab

Apr 2017 - Oct 2017

- Developed multilayered dental crowns and analyzed their microstructures with CT, fatigue tests, and nanoindentation

PUBLICATIONS

An orally available small molecule that targets soluble TNF to deliver anti-TNF biologic-like efficacy in rheumatoid arthritis. (2022)

Rodent models of post-traumatic stress disorder: behavioral assessment. *Translational Psychiatry* (2020)

Individual variability in behavior and functional networks predicts vulnerability using a predator scent model of PTSD. *Nature* (2019)

UNIVERSITY INVOLVEMENT & PROFESSIONAL SOCIETIES

Society for Neuroscience, Biomedical Engineering Society

2016-2020

Characterization of stress using a behavioral battery and exploration of behavioral inheritance in rats. *Neuroscience* (2017)

Vice President, Sigma Xi – The Scientific Research Honor Society

2018-2019

President & Fundraising Coordinator, Student Health Active Recruitment and Empowerment

2017-2019

- Supervised a 30-member team connecting students with volunteer opportunities and fundraised >\$30K for pediatric cancer
- Served on the Student Health Advisory Board as a liaison between students and University Health Services Administration

AWARDS AND ACHIEVEMENTS

- Penn State Student Leadership and Service Partisan Award 2017-2018
- Penn State College of Engineering Research Initiative Scholarship 2017-2018
- Business Experience for Undergraduates Scholarship 2017