ROGER SWARTZ

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Summary: I specialize in predictive modeling for inflation and securities forecasting, utilizing time series modeling and machine learning frameworks including TensorFlow and Keras. My expertise encompasses optimizing AI models through parameter and hyperparameter tuning, employing novel gradient descent techniques to enhance existing AI frameworks. I manage the complete data science workflow, ensuring robust, scalable, and actionable solutions across diverse asset classes and derivatives.

Technical Skills

Languages & Tools: Python, Neural Networks, Machine Learning, SQL, MATLAB, Git
Deep Learning Methods: AI, Neural Network Architectures, Neural Networks (TensorFlow, Keras), Novel Gradient Descent Techniques
Data Science Methods: Statistical Modeling, Time Series Forecasting and Modeling, KNN, Logistic Regression, Feature Engineering, Gradient Boosting, Grid Search in KNN, Random Forests Models and Ensemble Methods, Decision Trees, Automated Feature Engineering, Bayesian Optimization, one-hot encoding, Euclidian and Manhattan distances and Standard Scaler
Securities Analysis – Fundamental Analysis and Quantitative Analysis of Stocks, Bonds, Commodities and Options. Data Intensive Financial Modeling and Portfolio Allocation for Risk Minimization.
Workflow: Complete Data Science Workflow

Experience

SPRINGBOARD (Full-time)   Remote from Lexington, MA
DATA SCIENCE, MACHINE LEARNING AND DEEP LEARNING ENGINEER BOOTCAMP   September 2024 – August 2025 (expected)

- Skilled in Python, SQL, Neural Networks architectures including TensorFlow and Keras; to Carry Out Broad Scale Data Analysis and Predictive Modeling.
- As part of a Capstone Project Developed a time series model to forecast U.S. inflation (CPI) for any 2- to 8-year period from 1942 to the present, using extensive feature engineering and historical economic data dating back to 1939. Incorporated and evaluated ~15 key economic indicators (e.g., GDP, government and non-Government debt, commodity benchmarks) to enable highly predictive modeling with low loss across all periods from (1945–2025).
- Implemented parameter and hyperparameter tuning in Neural Networks including optimizing Neural Network Architectures batch size, epochs, call backs, regularization, dynamic modification of Adam Optimizer hyperparameters and activation functions and novel gradient descent and regularization techniques.
- Designed and Implemented Logistic Regressions, Time Series Modeling, Statistical Modeling, Gradient Boosting, Grid Search in KNN, Random Forests Models and Ensemble Methods, Decision Trees, Automated Feature Engineering, Bayesian Optimization, one-hot encoding, Euclidian and Manhattan distances and Standard Scaler.
- In depth training and analytics in the entire data science workflow
- Mentored weekly by a Professional Machine Learning Engineer

IMMUNOFUSE; AUTISM GENE THERAPY   August 2019 – Present
Co-Founder

- Communicated with more than 50 Venture Capitalists in the Life Sciences Space
- Posted positions and interviewed more than 100 candidates from receiving more than 1,000 resumes and incorporated 7 top tier interested candidates into Investor Deck.
- Prosecuted every aspect of the patent process prior to examination—from writing the entire non-Provisional Patent to making amendments, to amending patent applications as part of negotiated scope of invention with the U.S. Patent examiners.
- Risk Analysis for therapeutic program selection.
- Prepared a Business Plan and detailed market and risk analysis of the entire space in biopharmaceuticals for treatment of non-Small Cell Lung Cancer-Squamous Cell Carcinoma (NSCLC-SCC).
- Worked with an Investment Bank to prepare materials for potential investors and venture capitalists.
- Designed an Autism Gene Therapy Efficacy and Evaluation Standard for Humans and mice to project cognitive and adaptive behavior gains from an autism and neurodevelopment disorder gene therapy program.
- Applied distinct, stringent, heuristic data driven frameworks across three highly rigorous selection phases, narrowing ~1,100 potential Autism Gene Therapy candidates to the final top 2–3.

Additional Experience

PRINCETON UNIVERSITY/ Graduate Research Assistant i   Princeton, NJ
Graduate Research Assistant
Synthetic Organic Chemistry Methodology Research: Thesis: Synthesis and Evaluation of fluorinated hemi-labile Ligands in Asymmetric Catalysis. Demonstrated that a carbon-fluorine bond in a chiral ligand framework can provide a secondary mode of coordination to cationic Nickel species in a chiral ligand framework, allowing for a novel mode of coordination in asymmetric transition metal catalysis.
Teaching Assistant: Organic Chemistry Lab I and Organic Chemistry Lab II

PFIZER INC., GLOBAL R&D   Groton, CT
Synthetic Organic Chemist
- Proposed drug target design and their synthetic routes based on the biological activity of a collection of predecessor molecules
- Successfully completed several multistep syntheses of targets at various levels of molecular complexity
- Collaborated in biological and chemical matters with biologists, X-ray diffraction experts and computational chemists.

Education/Certifications

SPRINGBOARD (Full-time)   Remote from Lexington, MA

Certificate in Data Science with Deep Learning Specialization   September 2024 – August 2025 (expected)

- **Capstone Projects:** Inflation (CPI) modeling and forecasting from 1940 – Present using time series analysis of economic indicators. Incorporated and evaluated ~15 key economic indicators (e.g., GDP, government and non-Government debt, commodity benchmarks) in both original collected form and feature engineered form to enable highly predictive modeling to enable highly predictive modeling with very low mean squared error across all 2- to 5-year periods (1947–1954) and all 6- to 8-year windows (1954–2025).

The predictive time series model is primed to apply to different bonds, commodities and a broad range of securities and derivatives.

PRINCETON UNIVERSITY   Princeton, NJ
Graduate Diploma in Synthetic Organic Chemistry

UNIVERSITY OF PENNSYLVANIA   Philadelphia, PA
Chemistry Program and other Life Sciences Coursework
While enrolled in the M.S. in Chemical and Biomolecular Engineering Program and Biotechnology Program

DREXEL UNIVERSITY   Philadelphia, PA
B.S., Commerce and Engineering, Finance Concentration

Patent Applications

Title: Comprehensive Platform for the DNA and RNA In Human Expression of Dimeric and Polymeric Immunoglobulin A Delivered in a Single Payload.
Inventor: Roger B Swartz
Non-Provisional Patent Pending: Filed Length: 343 Pages **Published Length:** 176 Pages
Application No. 17/368,957 Filed: July 7, 2021
Publication Date: February 3, 2022
Publication No. 20220033851
International Application No. PCT/US2022/073525
International Publication No. WO2023279121
https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2023279121&_gid=202301
Status: Pending

Title: Episomal expression, genomic integrated lentiviral vector expression and mRNA expression of Potent Immunoglobulins Including Dimeric Immunoglobulin A1 and A2 via a furin cleavage site and 2A self-processing peptide to Enable Mucosal and Hematological Based Immunity or Protection via Gene Therapy for Allergens, viruses, HIV, bacteria, infections, pathology associated proteins, systemic pathologies, cancer, toxins and unnatural viruses.
Inventor: Roger B Swartz
Non-Provisional Patent Pending: Length: 178 Pages
Application No. 17/227,372 Filed: April 11, 2022
Publication Date: October 20, 2022
Publication No. US20220333130A1
Status: Pending

Title: Episomal Expression of Potent Immunoglobulins Derived from Human Blood to Enable Short Term Vaccination / Immunization to COVID, COVID-19 and Mutants and Other Pandemic and non-Pandemic Viruses Designed for Rapid FDA Emergency Use Authorization and Approval.
Inventor: Roger B Swartz
Non-Provisional Patent Pending: Length: 69 Pages
Application No. 16/995,829 Filed: August 18, 2020
Publication Date: March 3, 2022
Publication No. US20220064265A1
Status: Pending