Patrick M. Timons

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Education

Artificial Intelligence And Decision Making — *Bachelor of Science* Aug 2021 - May 2025
Massachusetts Institute of Technology GPA: 4.7/5.0
Minor: Mathematics; *Concentration*: Economics
Relevant Coursework: Algorithms II, Algorithms I, Mathematics for Comp Sci, Probability, Linear Algebra and Optimization, Deep Learning II, Deep Learning I, Representation, Inference, and Reasoning in AI, Machine Learning I, Networks, Microeconomics, Computation Structures, Low-Level Programming, Quantitative NLP, Computer Vision, Computer Programming, Linguistics, Biology, Chemistry
Planned Fall 2024: Statistics, Machine Learning II (Graduate), Advanced Molecular Biology (Graduate), Information Policy

Work Experience

Amazon Web Services — *SDE Intern* Jun 2024 - present
- Designed and implemented a data pipeline to process billing data for $\sim 20k$ enterprise AWS accounts
- Used Statistics and Machine Learning to forecast the billing of enterprise AWS customers
- Used interactive graphing frameworks to create expressive visualzations
- Followed model-first design principles to create an API Gateway facilitating access to the processed data, forecasts, and interactive graphs
- Interfaced diverse AWS cloud components, including S3, the AWS Data Catalog, and SageMaker
- Created a pipeline with Infastructure as Code (IaC) to deploy the micro-service for use by AWS data scientists and FinOps managers

Pier 88 Investment Partners — *Research Analyst Intern* May 2021 - Aug 2021
- Researched the decentralized finance space ("Defi") and developed stable-coin yield farming strategy
- Interviewed executive teams from public and private companies as part of investment due diligence
- Performed technical due diligence on early-stage AI startup for venture fund

Laboratory for Information and Decision Systems — *Research Assistant* Aug 2022 - Feb 2023
- Spearheaded data collection initiate for fuel emission modeling project
- Generated simulated drive cycle data through use of MOVES
- Worked tightly with pandas and SQL to deposit data in MySQL database

Baraja — *Research and Development Intern* Jun 2022 - Aug 2022
- Programmed Raspberry Pi prototype using Python and initiated product testing
- Refactoring DSP chain to enable partner perception company to optimize module of interest
- Facilitated technical collaboration with third party point cloud segmentation company

Technical Projects

Improving Deep Learning Based Molecular Fingerprints Through Informed Resampling — Oct 2023 - Dec 2023
- Worked in small team to research improvements to pretraining methods for transformer-based molecular encoders
- Created custom RoBERTa model through the use of transformers and bert-loves-chemistry (ChemBERTa) software packages with 9.1 percent improvement in Spearman's rank correlation coefficient on downstream tasks compared to the base model
- Coauthored 5-page ACL-submission-style write-up about project and results

Recovering Latent Variables with Variational Autoencoders despite Training Bias — Nov 2023 - Dec 2023
- Researched how beta-regularization robustifies VAEs to training bias when attempting to recover latent variables
- Trained models with PyTorch Lightning and used scientific computing libraries to generate training data and visualize results

Extracurricular Activities and Honors

MIT Men's Lacrosse — *Team Member* Aug 2021 - present
- Voted Most Improved for 2023 season, NEWMAC All-Academic Award (2023), 2022 NEWMAC Champion

AI@MIT — *Club Member* Sep 2022 - May 2023
- Worked in a team of 3 to build a document summarizer and present at the AIM Labs Demo Day

Global Teaching Labs — *Applied Math Teacher* Jan 2024 - Jan 2024
- Teaching selected topics in Operations Research with a focus on Bayesian Inference to high school students in Cremona, Italy

Skills

Foundational Data Structures & Algorithms, Programming (Python, Java, TypeScript, C++, Bash)
Design Patterns and Programming Paradigms Model-first development, Dependency Injection, Object-Oriented-Programming, Procedural Programming, Concurrency, Multithreading
Dev Ops Source Control, Build Tools, Dependency Management, CI/CD
Databases & Batch Computing SQL, Apache Spark, AWS Data Catalog, Slurm Workload Manager
Libraries and Ecosystems AWS, SageMaker, PyTorch, Pytorch Lightning, Numpy, Pandas, SciKit Learn, Transformers, Trans-