

Pavithran Chelliahpillai

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EDUCATION

University of Waterloo

Waterloo, ON

B.Eng. Software, Honours, Co-op

Expected Graduation 2029

Minor: Computing & Optimization — AI Specialization

CGPA 4.0

Academic Honours: Recipient of the Governor General of Canada's Academic Medal of Excellence (99.83% average)

Scholarships: UWaterloo President's Scholarship of Distinction, UWaterloo Alumni@Microsoft, \$15,000 UofT

President's Scholar of Excellence **Computing Honours:** CF Round 946 (Top 1%), Hypatia 2023 (Top 1%), CF Round 928 (Top 2%), CF Round 885 (Top 2%), CF Round 886 (Top 2%), CF Round 862 (Top 5%), CF Round 967 (Top 10%)

EXPERIENCE

HTS Engineering - Software Engineer

Jun. 2024 – Aug. 2024

- Designed and implemented a database system to efficiently index and manage **10k+ projects and code snippets**, enabling seamless future reuse and repurposing, resulting in **78hrs+** of employee time per project
- Developed a full-stack web application for project management using **Django, JavaScript, Node.js, PostgreSQL, and MySQL**, with over **1k+** daily individual uses and a CI/CD pipeline with under **1%** downtime
- Optimized retrievals by leveraging **polynomial rolling hashing** and designing a **latent semantic search indexing algorithm**, achieving a **300%+** improvement in query speed and a **73%** reduction in erroneous queries

Principle Air Systems - Automation Systems Programming Intern

Jun. 2022 – Aug. 2024

- Implemented C#, C++, and Java-based integrated graphics of over **100+** buildings' automated HVAC systems
- Planned 175,000ft²+** of buildings' layouts, integrating low-latency (**< 40ms**) JavaScript API controls with a UI
- Applied programming expertise in automotive programming systems across **50+ large-scale projects**

Narpavi Consultancy - Software Engineering, Freelance

Jan. 2024 – Present

- Developed front-end (**HTML, CSS, JS**) and back-end (**Svelte, MERN Stack**) web applications and sites for **10+** companies and organizations, generating **\$10k+** annualized profit and providing reliable maintenance
- Portfolio of work: [Kanthavanam](#), [Principle Air Systems](#), [Personal Site](#)

Oakville Swim Academy - Swim Instructor

Feb. 2023 – Jul. 2024

- Worked with 100+ students—and 50+ staff—of all skill levels and abilities from beginners to Olympic levels
- Collaborated with deck supervisors, operational managers, and parents to provide high quality lessons

PROJECTS

TrainTrack | C++, Armadillo, Dlib, QuantLib, React.js, PostgreSQL

- Developed a Svelte webapp to back-test **5,000+ user-created** stock strategies through artificial intelligence
- Recognizes distinctions to **4 decimal precision** in price action between technical (chart-based) analysis and fundamental (event/news-based) analysis and returns an **accuracy score** within **3 minutes** of execution
- Utilizes mathematical and optimization principles—**PCA** for dimensional reduction, **Bayesian Networks** for probabilistic graphical modelling, **CHT** for convex optimizations—resulting in **97.3% profitability on trades**

Trade Impact Modeller | TensorFlow, Keras, Scikit-learn, NumPy, Pandas, IBKR API

- Models trade impact using order book data with **20,000,000,000** trade placements in under **nanosecond** precision, using the principles of trade impact from Obizhaeva-Wang, and Alfonsi-Schied square-root models
- Optimizes execution strategy by using an AI/ML reinforcement model with over **1,000,000** datapoints, limiting slippage to **under 1e-19% of the trade**, trading in over **5,000 global markets** and liquidity conditions

LEGOify | Python, C++, React, Django, MySQL

- Created an app designed from scratch to allow **100+** users to take a picture of any item and receive pictorial instructions **within 3s** on how to create a **3-D** LEGO model of the object, split into LEGO-styled booklets
- Applied a **divide-and-conquer** algorithm with **dynamic programming** techniques to optimize solutions for large-scale models with **20k+** bricks and spanning **30ft+**, along with photogrammetry artificial intelligence

Automaton | Python, JavaScript, AWS, PyTorch, Svelte

- Utilizing supervised learning models, recognized and categorized **over 2,000** repetitive tasks from raw data input
- Using a Natural Language Processing model, automated text-heavy tasks including email generation, data scraping, summarizing, etc. to reduce **2hrs/day** of manual workload, integrating the workflow through **RPA models**