Amutheezan Sivagnanam

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U.S. Permanent Resident | Scholar | https://www.linkedin.com/in/amutheezansivagnanam | Github | **Open to relocation**

SUMMARY

— **PhD Candidate** and **Software Development Engineer** specializing in **Deep Reinforcement Learning**

— **Two** years of industrial experience in **software development**, **testing** and **CI/CD** while following **agile practices**

— **Six** years of academic research experience building **scalable reinforcement learning** and **deep learning** systems for efficient ML **training** and **deployment**

— Good **publication** record with **an h-index of 6 and 100+ citations**, featuring in top-tier **AI and ML** conference

EDUCATION

Ph.D. Computer Science, (August 2025): **Pennsylvania State University**, University Park, PA, Advisor: Dr. Aron Laszka

- Dissertation: Application of Deep Reinforcement Learning to Solve Optimization Problems in Transportation Domains

M.S. Computer Science, (August 2022): **University of Houston**, Houston, TX, Advisor: Dr. Aron Laszka

B.S. Computer Science and Engineering, (January 2018): **University of Moratuwa**, Moratuwa, Sri Lanka

SOFTWARE ENGINEERING EXPERIENCE

Software Engineer, *LSEG Technology*, (January 2018 - July 2019)

— Introduced **unit testing** for libraries in the Post-Trade **C++** codebase, improving system performance and reliability

— Implemented and validated **Oracle database changes** for Post-Trade products for the Singapore Stock Exchange using **Behavior Driven Development** (BDD) testing approaches in **Java**, ensuring data integrity and system functionality

— Contributed to the **CI/CD pipeline** of the Post-Trade product using **Python and Git** ensuring seamless software updates

Software Engineering Intern, *WSO2 Lanka PVT Ltd*, (July 2016 - December 2016)

— Engineered an **alert generation system** to monitor disease outbreaks by analyzing descriptive **HL7/FHIR data**, automating email and SMS notifications, and supporting rapid decision-making through prompt data processing

— Developed a mechanism to evaluate hospital functionality by assessing bed and oxygen cylinder availability from admission and discharge messages, with **effective requirements gathering** and integration of **structured data processing**

— **Skills**: Python, C++, JAVA, JS, PHP, SQL, Oracle DB, Object Oriented Development, Github, Linux, Agile Practices, **Behaviour Driven Development (BDD)**, JIRA, Selenium, Vaadin, **Natural Language Processing (NLP)**, Data Analytics, HL7, FHIR, **CI/CD**

RESEARCH EXPERIENCE

Graduate Research Assistant, *Pennsylvania State University*, (August 2022 - May 2025)

— Devised and evaluated a **Transformer** based **multi-agent reinforcement learning algorithm** to solve the **emergency responder reallocation problem** that **reduces** decision making time **by 3 orders of magnitude**

— Leveraged a **deep reinforcement learning** approach to tackle the challenge of online vehicle routing with advance booking, enabling **prompt confirmation within seconds**

Graduate Research Assistant, *University of Houston*, (September 2019 - August 2022)

— Introduced a novel **reinforcement learning** based solution approach to solve the problem of **online booking for offline vehicle routing problem** which resulted in **20 % reduction of operational costs** for the transit agency

— Introduced **novel problem formulation and algorithms** that **lower the energy costs by $140k** annually for public transit agencies operating mixed fleets of buses

— **Skills**: **Python**, C++, Java, C, SQL, MySQL, MongoDB, SQLite, **PyTorch**, TensorFlow, Scikit-learn, Transformers, Machine Learning, Deep Learning, Computer Vision, **Reinforcement Learning**, DQN, DDPG, TRPO, PPO, GRPO, LLM, RLHF, RAG, Prompt Engineering, LangChain, LangGraph, Bayesian Optimization, Data Science, Data Visualization, Clustering, Statistical Analysis, Data Mining, Slurm, Ray, RLLib, OpenAI Gym, NumPy, pandas, matplotlib, Linear Programming, Integer Programming, CPLEX, Gurobi, Mosek, OR-Tools, Spark, **Amazon Web Services (Sage Maker, S3, Lambda)**, Git, Docker, Linux, Bash, Object-Oriented Development, MATLAB

SELECT PUBLICATIONS

A. Sivagnanam et al.; Multi-Agent Reinforcement Learning with Hierarchical Coordination for Emergency Responder Stationing. International Conference on Machine Learning. **ICML** 2024. **Core Ranking A***

A. Sivagnanam et al.; Offline Vehicle Routing Problem with Online Bookings: A Novel Problem Formulation with Applications to Paratransit. International Joint Conference on Artificial Intelligence. **IJCAI** 2022. **Core Ranking A***, Invited Talk: Vienna Austria

A. Sivagnanam et al.; Minimizing Energy Use of Mixed-Fleet Public Transit for Fixed-Route Service. AAAI Conference on Artificial Intelligence. **AAAI** 2021. **Core Ranking A***, Invited Talk: Virtual Conference

REFERENCES

Dr. Aron Laszka (PhD Supervisor)
Position: **Assistant Professor**
Affiliation: **Pennsylvania State University**
Email: aql5923@psu.edu
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