Amutheezan Sivagnanam

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

SUMMARY

Machine Learning Engineer with expertise in **reinforcement learning**, **large-scale optimization**, and **deep learning**. Skilled in building and deploying **ML systems**, scaling **training pipelines**, and **optimizing inference performance**. Experienced in **bridging** research innovations with production-ready solutions.

TECHNICAL SKILLS

- **ML/AI**: PyTorch, TensorFlow, Transformers, LLMs, LoRA, DDPG, PPO, RLHF, LangChain, Scikit-learn
- **Systems/Infra**: AWS (SageMaker, Lambda, S3), Spark, Docker, Kubernetes, Git, CI/CD, SLURM
- **Optimization**: CPLEX, Gurobi, Mosek, OR-Tools, Linear & Integer Programming
- **Programming**: Python, C, C++, Java, SQL

EDUCATION

Ph.D. Informatics, (August 2025): **Pennsylvania State University**, University Park, PA
- **Topic**: Application of Deep Reinforcement Learning to Solve Optimization Problems in Transportation Domains

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

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

EXPERIENCE

Graduate Research Assistant – Penn State University *Aug 2022 – May 2025*
- Built transformer-based multi-agent RL system reducing emergency responder reallocation latency **from a couple of minutes to fraction seconds**, scalable to large scale cities (**ICML 2024**)
- Developed an online vehicle routing system with advance booking; achieved **real-time request confirmation in less a second**, improving service rates against other baselines

Graduate Research Assistant – University of Houston *Sep 2019 – Aug 2022*
- Engineered RL solution for transit routing with advance booking that cut **operational costs by 20%**, validated with a partner transit agency (**IJCAI 2022**)
- Modeled energy-aware scheduling for mixed-fleet buses, reducing annual energy costs by **$140K** (**AAAI 2021**)

Software Engineer – LSEG Technology *Jan 2018 – Jul 2019*
- Developed and maintained application software using **Java, C++, and Python** with **Object-Oriented principles**, implementing Agile practices (Scrum) to improve productivity, and performance
- Designed and executed **unit testing** and **BDD-based tests** ensuring system reliability, regression compatibility, and enhanced test coverage

Software Engineering Intern – WSO2 *Jul 2016 – Dec 2016*
- Built an end-to-end **HL7/FHIR monitoring** system using WSO2 ESB, DAS, and BAM for both **real-time (Siddhi)** and **batch (Spark)** analytics of healthcare data

SELECT PUBLICATIONS

- **A. Sivagnanam** et al.; *Multi-Agent Reinforcement Learning with Hierarchical Coordination for Emergency Responder Stationing*. International Conference on Machine Learning. **[ICML 2024]**
- **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]**
- **A. Sivagnanam** et al.; *Minimizing Energy Use of Mixed-Fleet Public Transit for Fixed-Route Service*. AAAI Conference on Artificial Intelligence. **[AAAI 2021]**