

AMUTHEEZAN SIVAGNANAM

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EDUCATION

- PhD in Informatics** Aug. 2022 - Present
Pennsylvania State University, University Park, PA
Supervisor: Dr. Aron Laszka
- PhD. in Computer Science (Transferred to PSU)** Aug. 2019 - Aug. 2022
The University of Houston, Houston, TX
Supervisor: Dr. Aron Laszka
- MSc. in Computer Science** Aug. 2019 - Aug. 2022
University of Houston, Houston, TX, GPA : **4.00/4.00**
- BSc. (Hons) in Computer Science and Engineering** Jan. 2014 - Jan. 2018
Faculty of Engineering, University of Moratuwa, Sri Lanka, GPA : **3.81/4.20**

SKILLS

Fields : Artificial Intelligence, Machine Learning, Reinforcement Learning
Language and Tools : Python, TensorFlow, Keras, Git, Docker, CPLEX, Mosek, Google OR-Tools, C, C++, Java

EXPERIENCE

- Graduate Research Assistant — Pennsylvania State University** University Park, PA, USA
Resilient Networks and Systems Lab *Aug. 2022 - present*
- Introduce novel deep reinforcement learning-based approach to proactively reposition the responders in emergency responder management systems. Python, Google OR Tools, Tensorflow, Keras, Scikit-Learn
- Graduate Research Assistant — The University of Houston** Houston, TX, USA
Resilient Networks and Systems Lab *Sep. 2019 - Aug. 2022*
- Introduced mathematical models to solve transit optimization problems (e.g., minimizing energy consumption in public transportation operating mixed fleets of electric and gasoline vehicles, optimizing the online booking for paratransit services with offline vehicle routing problem setting). Implemented the algorithm and solution approaches for mathematical models in Python, using libraries such as CPLEX, Google OR Tools, Keras, and TensorFlow.
 - Collected the real-world data and analyzed it to study trends with the assistance of Python (e.g., para-transit operation before and after COVID-19, the benefit of vulnerability reward programs)
- Software Engineer — LSEG Technology** Colombo, Srilanka
Post Trade Team *Jan. 2018 - Jul. 2019*
- Unit Testing for Libraries in Post Trade C++ Code was introduced. Database changes for Post Trade products for Singapore Stock Exchange were made and validated with Behavior Driven Development (BDD) testing approaches using Java. And worked on CI/CD of the Post Trade product with Python and Git. Practiced Agile-based development throughout the entire period of work.
- Software Engineering Intern — WSO₂ Lanka PVT Ltd.** Colombo, Srilanka
Data Analytics Team *Jul. 2016 - Dec. 2016*
- Implemented alert generation mechanism, which provides email and SMS when a disease spreads wide by analyzing the description. Implemented alert generation mechanism, which could determine the functional state of hospitals (i.e., number of beds available, number of Oxygen cylinders available) based on the admission and discharge messages.

PHD PROJECTS

- Minimizing Energy Use of Mixed-Fleet Public Transit for Fixed-Route Service**
- Formulated the mathematical model to optimize the energy consumption of public transit agencies that operates mixed fleets of Electric (EV) and Internal Combustion Engine (ICEVs) Vehicles.
 - Solution approach comprised of heuristics and meta-heuristics to solve larger problem instances in polynomial time.
- Offline Vehicle Routing Problem with Online Bookings for Paratransit Operations**
- Introduced a novel mathematical formulation that helps to determine tight pickup windows, given the online day-ahead booking is flexible.

- The solution approach determined the tight pickup windows using deep reinforcement learning support by anytime algorithm to provide the solution with minimum vehicles.

The Benefits of Vulnerability Discovery and Bug Bounty Programs

- Study the Chromium data to determine whether external bug-hunters enhance the software security through Chromium Vulnerability Reward Programs.

SELECTED PUBLICATIONS

- **Amutheezan Sivagnanam**, Salah Uddin Kadir, Ayan Mukhopadhyay, Philip Pugliese, Abhishek Dubey, Samitha Samaranyake, Aron Laszka. “*Offline Vehicle Routing Problem with Online Bookings: A Novel Problem Formulation with Applications to Paratransit.*” In proceedings of the 31st International Joint Conference on Artificial Intelligence (IJCAI 2022). <https://www.ijcai.org/proceedings/2022/0546.pdf>
- **Amutheezan Sivagnanam**, Afiya Ayman, Michael Wilbur, Philip Pugliese, Abhishek Dubey, Aron Laszka. “*Minimizing Energy Use of Mixed-fleet Public Transit for Fixed-route Service.*” In Proceedings of the 35th AAAI Conference on Artificial Intelligence (AAAI ’21), February 2-9, 2021, Virtual Event, 7 pages. <https://ojs.aaai.org/index.php/AAAI/article/view/17752>
- Soodeh Atefi, **Amutheezan Sivagnanam**, Afiya Ayman, Jens Grossklags, Aron Laszka. “*The Benefits of Vulnerability Discovery and Bug Bounty Programs: Case Studies of Chromium and Firefox.*” Accepted for publication by The Web Conference 2023 (WWW 2023), April 30 - May 4, 2023, Austin, TX, USA, 8 Pages. <https://arxiv.org/pdf/2301.12092.pdf>
- Afiya Ayman, **Amutheezan Sivagnanam**, Michael Wilbur, Philip Pugliese, Abhishek Dubey, Aron Laszka. “*Data-driven Prediction and Optimization of Energy Use for Transit Fleets of Electric and ICE Vehicles.*” Accepted: ACM Transactions of Internet Technology, 29 Pages. <https://dl.acm.org/doi/abs/10.1145/3433992>