Noelle T. Law

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EDUCATION

New York University Tandon School of Engineering | GPA: 3.93/4.0 May 2023
Master of Science, Summa Cum Laude, Computer Science
Selected Coursework: Artificial Intelligence, Machine Learning, Deep Learning, Robot Localization & Navigation

University of Virginia | GPA: 3.57/4.0 May 2021
Bachelor of Science with Distinction, Computer Engineering (Minor: Design Integration)
Selected Coursework: Autonomous Mobile Robots, Robotics for Software Engineers, Embedded Computing & Robotics
Awards: Louis T. Rader Chairperson Award for Best Capstone, VA-NC Alliance Academic Achievement Award

SKILLS

Programming Languages: Python, C++, C, MATLAB, Javascript, Java, x86 Assembly, shell scripting
Application Software & Toolboxes: Docker, AWS, ROS, NVIDIA Omniverse, PyTorch, TensorFlow, Git, Linux

PROFESSIONAL EXPERIENCE

Machine Learning & Perception Engineer | JHU Applied Physics Lab Summer 2023 – Current
- Design and develop algorithms for more interpretable and trustworthy machine learning systems, with focus on vision (multispectral) and language modalities.
- Principal Investigator for Conformal Autoregressive Generation for Large Language Models, in which a multi-hypothesis-based approach is leveraged to better quantify model uncertainty.
- Redesigned data preprocessing pipeline, improving speed by 92% and allowing for quicker downstream model development.

Research & Advanced Engineering Intern | Ford Motor Company, Greenfield Labs Summer 2022
- Explored use of machine learning for robotic grasping operations through use of 6-DoF deep object pose estimation, in which a one-shot deep fully convolutional neural network was used as a part of a larger system.
- Developed synthetic data pipeline and simulations of 3D depth cameras in ROS and NVIDIA Omniverse, including the development, training, and testing of datasets for 4 YCB objects and for a Ford custom object.
- Presented accomplishments to team of 30+ team, project, group members and leads.
- Completed an ablation study of a ViT-based architecture for deep object pose estimation during Fall 2022.

Embedded Computing & Robotics TA and Course Developer | University of Virginia Spring 2020 – Spring 2021
- Provided active instruction to 50+ students, including the development of labs, tutorials, and weekly quizzes to ensure learning goals were met.
- Researched and redeveloped course curriculum throughout summer 2020.

RELEVANT PROJECTS

Vision-language Models for Open-vocabulary Semantic Segmentation Fall 2022 – Spring 2023
- Pursued a master's thesis in the Data, Intelligence, and Computational Engineering lab under Prof. Chinmay Hegde with a focus on vision-language (VL) models for open-vocabulary semantic segmentation of autonomous driving datasets. A meta-analysis was performed to identify impact of training dataset, common model bottlenecks, and model-accuracy-throughput trade-ff when applied in a zero-shot setting.
- A new visualization technique, Triangles, was implemented to more efficiently analyze model results.
- A context-aware region-classification architecture was designed for open-vocabulary segmentation based on issues identified in the meta-analysis.

Fast, Safe, and Proactive Runtime Planning and Control of Autonomous Ground Vehicles in Changing Environments (DOI: 10.1109/SIEDS52267.2021.9483719) Fall 2020 – Spring 2021
- Published and presented at the IEEE Systems Information Engineering Design Symposium, Spring 2021.
- Designed a neural network-based framework for the proactive planning and control of an autonomous vehicle navigating through different terrains using Python, MATLAB, ROS, and Gazebo simulation software.
- Determined velocity of vehicle through multi-objective optimization that maximized speed and safety.

The Robotany Fall 2020
- Created a cybernetic plant to track moisture levels, monitor growth, and move based on its lighting needs.
- Implemented a control algorithm in C using an ISR task scheduler to integrate light sensors, bump switches, cliff sensors, and the plant's bioelectrochemical signals.
- Designed a CV algorithm with TensorFlow, OpenCV, and Python to isolate the plant from a user background, remove glare, and determine the growth levels of the plant for electrode placement and harvesting.
- Transmitted plant data via a WiFi module to be displayed on a user application.