RUSSELL SCHWARTZ

Computer Science Researcher and AI Developer

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EDUCATION

Carnegie Mellon University Aug 2022 – Dec 2023
Master of Science in Computer Science *Pittsburgh, PA*

University of Maryland (4.00 GPA) Aug 2018 – May 2022
Bachelor of Science in Computer Science *College Park, MD*
Bachelor of Science in Mathematics

PROFESSIONAL EXPERIENCE

Johns Hopkins Applied Physics Lab May 2021 – Aug 2021
Intelligent Systems Intern *Laurel, MD*

- Developed tooling in python, C++, and fortran to optimize the flight-plan of aircraft under a complex objective function involving the communication between an onboard device and an orbital satellite
- Utilized modern non-linear solvers in conjunction with legacy high-fidelity physics simulations

NASA Jet Propulsion Lab Jan 2021 – April 2021
Robotics & Artificial Intelligence Intern *Pasadena, CA*

- Worked with JPL roboticists on Mars 2020 mission to investigate methods for terrain-relative navigation using monocular cameras for robots operating in GPS-denied areas or planetary rovers, resulting in several publications
- Developed robust methods for extracting salient terrain features (e.g. the peak of a distant hill) from an RGB image via semantic segmentation with DeepLab as well as traditional computer vision techniques
- Studied the effectiveness of using observed features (in conjunction with an accurate map) to estimate robot pose; developed QGIS plugins to automate the analysis pipeline and applied to Jezero Crater

Ncyber LLC May 2019 – Aug 2019
Mobile Software Development Intern *Columbia, MD*

- Developed a network analysis app for Android mobile devices that tests network speed and stability, aggregates user data across multiple devices, and generates real-time data visualizations

Treble Network April 2018 – March 2019
Software Development & Data Science Intern *Baltimore, MD*

- Developed and tested applications for iOS, Android, and Web, and analyzed customer analytics using Firebase and Pandas

SKILLS

Languages

Python C/C++17 C# Java JavaScript TypeScript Matlab

Frameworks

Numpy Pandas TensorFlow Keras PyTorch Scikit-learn OpenCV

Technical

Git Gitlab CI/CD Docker Unix LaTeX

Non-Technical

Mathematical reasoning Research formulation Data visualization Self-management

RESEARCH EXPERIENCE

CMU Robotics: AART Lab Sep 2022 – Present

Researching the deployment of a team of robots for simultaneous exploration and monitoring of a dynamic spatio-temporal environment. Phenomenon are modeled using a mixture of gaussian processes. Research is ongoing.

UMD Robotics: RAAS Lab Aug 2019 – May 2022

Investigated task-allocation algorithms for multi-agent robotic systems operating in highly failure-prone (and even adversarial) environments, where cooperation leads to higher chance of success. Presented findings at RSS 2020.

Gemstone Team LEMMA Aug 2018 – May 2022

Developed novel methods to automatically detect and model the spread of extremism in niche online communities. Implemented sophisticated NLP tools (including BERT) to automatically identify extreme content in a >5TB dataset.

PUBLICATIONS

- J. Vander Hook, R. Schwartz, K. Ebadi, K. Coble, and C. Padgett, "Topographical landmarks for ground-level terrain relative navigation on mars," in *IEEEAerospace AeroConf*, 2022.

- K. Ebadi, K. Coble, D. Kogan, D. Atha, R. Schwartz, C. Padgett, and J. Vander Hook, "Semantic mapping in unstructured environments: Toward autonomous localization of planetary robotic explorers," in *IEEEAerospace AeroConf*, 2022.

- Schwartz, R., & Tokekar, P. "Robust Multi-Agent Task Assignment in Failure-Prone and Adversarial Environments" in *Robotics: Science and Systems*, 2020

- Schwartz, R., Long, M. "Deriving unexpected constants from Pascal's Triangle". *HCC Journal of Research in Progress - First Ed.*, 2017

🔒 Active TS/SCI Clearance