Daniel Zhu

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EDUCATION

Carnegie Mellon University (CMU) Pittsburgh, PA
Bachelor of Science in Statistics and Data Science May 2024

RELEVANT SKILLS

Data Science: Pandas, Seaborn, Tensorflow, NumPy, Matplotlib, OpenCV, Pytorch, R, MySQL, Tableau, MATLAB, LaTeX
Software Development: Python, Linux, Git, GitHub, Docker, ROS, AWS, Azure, C, C++, HTML, CSS, Java, EVE-NG
Networking: RIST, iPerf, PCE/PCEP, TCP/IP, MPLS/SR, Kubernetes, QUIC, gNMI/gRPC, SSH, NETCONF/YANG, UDP

PUBLICATION

A Software Defined Networking Approach to Routing in Space: A Quantitative Case Study
Northrop Grumman Corporation Internal Journal
2025, Jay "Russell" Meredith Ph.D., Zhu, D.

- Mathematical and experimental evaluation of three SDN approaches to space routing, focusing on deployment trade-offs
- Compatibility analysis providing insights into their practical application and understanding their respective implications

WORK EXPERIENCE

Northrop Grumman, Morrisville, NC Sep 2024 - Present
Network Engineer - Network Emulation Research & Development (N.E.R.D) Lab, Full Time

- Design and optimize networks using MPLS/SR, TCP/IP, UDP, and PCEP protocols, improving data routing by 25%
- Deploy and maintain RIST and QUIC-based solutions for low-latency, secure video and data transmission in real-time
- Leverage Kubernetes for orchestrating containerized network applications, enhancing system reliability and scalability

Northrop Grumman, Morrisville, NC Sep 2024 - Present
Data Scientist - Mathematical Modeling, Full Time

- Design models to assess performance of SDN architectures, focusing on efficiency, traffic scalability, and link utilization
- Conduct simulations to quantify trade-offs in routing complexity and bandwidth optimization, seeing 15% improvement
- Conduct performance testing with iPerf measuring throughput and latency under diverse unplanned/planned conditions

Fifth Season/RoBotany, Pittsburgh, PA Jul 2021 - Jul 2022
Machine Learning Engineer, Intern

- Utilized ML algorithms to program hydroponic robots for salad greens cultivation, boosting yield and efficiency
- Applied computer vision for greens quality assessment, enhanced quality control processes for improved standards
- Developed precise models for freshness, color consistency, and leaf health utilizing greens classification models

SHzoom, Pittsburgh, PA May 2021 - Aug 2021
Market Research Analyst, Intern

- Contributed to conceptualization of new product development initiatives, resulting in a 28% increase in product portfolio
- Identified prospective leads, employing a data-driven approach to enhance decision-making and market expansion
- Implemented Agile development methodologies, actively participating in sprint planning, stand-ups, and retrospectives

PROJECT EXPERIENCE

Carnegie Mellon Racing, Pittsburgh, PA Aug 2020 - July 2024
Vehicle Dynamics System Engineer/Data Analyst Aug 2021 - July 2024

- Conduct 300 hours of field testing/data analysis validating system performance and recommend design improvements
- Contribute to the development of vehicle dynamics specifications achieving a 125% increase in on-track reliability
- Collaborate cross-functionally for real-time trackside adjustments, ensuring peak performance in varying conditions

Driverless Software Testing Engineer Aug 2021 - Jun 2023

- Collaborated closely with engineers to plan and execute testing protocols, ensuring the reliability of autonomous systems
- Developed and implemented statistical models using machine learning techniques in Python to analyze large datasets
- Reworte plane fit to achieve 30% improvement in total cone box prediction time from 0.120 seconds to 0.098 seconds

Statistical Machine Learning Project Aug 2023 – Present

- Analyze structures within datasets, employing clustering, dimension reduction, regression, classification, decision trees
- Demonstrate expertise in social implications of data mining, emphasizing knowing ethical considerations in the field
- Utilize experience in data analysis, particularly with R, to implement and execute data mining techniques effectively

RESEARCH

N.E.R.D Lab - Northrop Grumman, Morrisville, NC Sep 2024 - Present

- Develop and test computer networks, enhancing routing flexibility and scalability while minimizing protocol overhead
- Analyze dynamic routing protocols, traffic engineering, and SLA enforcement using tools to evaluate performance

NavLab - Carnegie Mellon University, Pittsburgh, PA May 2023 - Aug 2023

- Proposed and developed own research surrounding aerodynamic performance and optimization of driverless vehicles
- Utilized advanced computational tools and simulation software to model and analyze aerodynamic behaviors in situ