ZAIN-UL-ABIDEEN NASIR

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EDUCATION

Binghamton University Expected May 2024
Master of Science, Computer Science, AI Track | GPA: 3.95/4.00

Binghamton University Dec 2022
Bachelor of Science, Computer Science | GPA: 3.95/4.00

WORK EXPERIENCE

Graduate Research Assistant Jan 2023 - Present
Jayson Boubin, Binghamton University

- Design low-latency data pipelines for drone video streams with OpenCV, enabling real-time object detection
- Retrain and evaluate object-detection models in PyTorch to identify plant health in forest environments
- Implement edge-based SLAM navigation techniques for autonomous drones in dense outdoor settings
- Integrate network analysis for client-server drone communication, improving latency and eliminating data loss
- Streamline algorithm deployment through Docker containers for increased portability
- Adapt SLAM algorithm for CUDA-enabled drone applications via Nvidia Jetson

Teaching Assistant Jan 2023 - Present
Computer Science Dept., Binghamton University

- Teach lectures on operating systems, and design and analysis of algorithms
- Manage lab sessions, explaining topics such as xv6 kernel hacking, file systems, and scheduling
- Provide individualized assistance to students through office hours, clarifying course concepts

Software Development Intern Jun 2022 – Aug 2022
Advertising Specialty Institute

- Extended the design library through 20 reusable frontend components coded in Typescript
- Implemented product-sharing feature in Angular, enhancing conversion rates by 18%
- Incorporated 30 interaction tests in Storybook, improving code quality and eliminating user-interface issues
- Supervised a team of four and developed a webpage for the company networking event
- Collaborated within a cross-functional team of 20, utilizing Jira to streamline project workflow

Undergraduate Research Assistant Jun 2021 – Jun 2022
David Liu, Binghamton University

- Investigated data schemas for time-series stack traces
- Customized Protocol Buffers to serialize energy data for Linux-based systems
- Executed experiments to test energy-awareness on mobile apps, such as YouTube

PROJECT EXPERIENCE

Ball-tracking Robot

- Designed and implemented a ROS project utilizing OpenCV for ball detection and tracking
- Integrated autonomous navigation through a SLAM algorithm, allowing the TurtleBot to avoid obstacles
- Implemented a user-interface to allow users to visualize the robot detecting and tracking the ball in real-time

Spotted Lantern Fly Detection through Drones

- Coded a SLF-detection system for drones, capable of detecting insects in forests and crops
- Consolidated 1000-image PyTorch dataset and retrained YOLOv8, enhancing its accuracy
- Integrated trained model with Parrot Anafi drone for aerial surveillance and real-time video analysis

Autonomous Map Navigation

- Customized a deep Q-learning algorithm to autonomously navigate goal-based game environments
- Implemented a two-part neural network in PyTorch for generating optimal actions
- Established a visualization mechanism, enabling observations of training and testing progress

TECHNICAL SKILLS

- **Languages:** C++, Python, Java, Javascript, Typescript
- **Software/Hardware:** Object Detection, Computer Vision, Reinforcement learning, PyTorch, Docker, Git, Nvidia JetPack