Ritish Shailly

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Education

VIRGINIA TECH (Virginia Polytechnic Institute and State University) *Blacksburg, Virginia*

M.Eng. in Computer Science *08/2023 - 05/2024*

M.S. in Mechanical Engineering *08/2021 - 05/2024*

B.S. in Mechanical Engineering *08/2017 - 05/2021*

Skills

Programming Languages	Python, C#, C/C++, Java, JavaScript, TypeScript, Dart, Kotlin, Matlab, Ladder
Web Development	HTML, CSS, XML, jQuery, Vue.js, React, Node.js, Express.js, Django, Bootstrap, Flask, Flutter, Blockchain
Database Management	SQL (PostgreSQL, MySQL), MongoDB
DevOps and API Tools	IIS, Git, Docker, OpenShift, Kubernetes, Azure DevOps, TFS, Octopus Deploy, Swagger, Postman
Robotics	ROS, ROS2, Rockwell Automation RSLogix PLC, Turtlebot3, UR10, Franka Panda, Viam Rover, RViz, IOT
Simulation and 3D Modeling	Simulink, Gazebo, PyBullet, Unity, Siemens NX, Autodesk Inventor, Solidworks, Fusion 360, Blender
AI, ML and CV	Numpy, Pandas, SciPy, Matplotlib, Pytorch, Tensorflow, Keras, scikit-learn, scikit-image, OpenCV, Open3D
Others	Lifts, Conveyors, welding, Pneumatic systems, Hydraulic systems, Electrical systems, Documentation, Computer controlled systems, Motor drives, Sensors, AC/DC converters, Encoders

Experience

Blast AI *Blacksburg, VA*

Lead Software Developer *05/2023 - 09/2023*

- Led a team of 3 engineers to develop a React based web app that assesses users' loan approval chances using ML.
- Built a model leveraging OpenAI's API to ascertain loan approval chances for a user using the web app.
- Data is processed by a model to generate a confidence score for loan approval likelihood.
- The deployed prototype secured funding from stakeholders and won a spot at the 2023 CogX startup summit in London.

Void Robotics *Marathon, FL*

Robotics Software Engineering Intern *03/2023 - 06/2023*

- Implemented C++ based algorithms for the advanced navigation stack of a mobile robot using ROS2 Humble in Linux.
- Utilized RViz plugins for sensor data analysis, map creation, and pathfinding, integrating CMake for build management.
- Automated the development workspace using Jenkins for CI/CD, significantly enhancing operational efficiency.

Collaborative Robotics Lab (PI: Dr. Dylan Losey) *Blacksburg, VA*

Graduate Research Assistant *06/2021 - 05/2022*

- Codeveloped pneumatic haptic interfaces to facilitate effective communication of robot learning processes and Engineered a pneumatic system to manage high-pressure air supply from source to haptic interfaces on a robotic arm.
- Implemented Imitation Learning Algorithms using Pytorch and CUDA to compute uncertainty of a UR-10 robot. Uncertainty is then communicated by 3 baselines.
- Conducted user studies and surveys to find the best method for robot communication over 3 different baselines.
- Improved learning outcomes by 7% and cut teaching time by 20%.
- Our journal paper secured the 2024 IEEE Transactions on Haptics Best Application Paper Award.

Advanced Controls Systems Lab (ACSL) *Blacksburg, VA*

Robotics Controls and GUI Intern *05/2020 - 08/2020*

- Utilized C++ and PID control for motion planning of the Widow WX200 Robotic Arm within the Gazebo simulation.
- Leveraged MATLAB as a dedicated ROS node to effectively operate and control the robotic arm.
- Designed and implemented a user-friendly GUI for robot manipulation across 3 env: Real-world, Gazebo, and Simulink.

ABB *Fort Smith, AR*

Product Management Intern *05/2019 - 08/2019*

- Conducted detailed competitive analysis to accurately determine market share and assess product quality.
- Developed & significantly enhanced innovative training modules for future employees utilizing Waterfall methodology.
- Formalized & streamlined the product, technology, and research development processes utilizing Agile methodology.
- Successfully obtained yellow belt certification in lean six sigma training.

Selected Projects

PaperPalooza: Integrated Research and Collaboration Platform
Blacksburg, VA

Software Developer — *01/2024 - 05/2024*

- Developed PaperPalooza, an AI-driven web app to streamline academic research and enhance user research experience.
- Utilized Lean-Agile methodology and teamwork to develop PaperPalooza web app with Streamlit in Python.
- Integrated APIs for grammar check, citation manager, and scholarly searches, managing data with PostGRES.
- Implemented AI chatbot for user friendly support and queries, employing Git/GitLab for version control.
- Built responsive UI, Dockerized app, and deployed it to web server.

Real-World Language-driven Zero-Shot Object Navigation
Blacksburg, VA

Lead Software Developer and Product Owner — *08/2023 - 12/2023*

- Enabled zero-shot object navigation for the Viam Rover in real-world environments. Utilized Intel Realsense camera to capture images. Developed a navigation agent that can navigate in unknown environment with no prior training.
- Used *MetaAI ImageBind* and *OpenAI CLIP* to combine image, text and depth embedding to identify object.
- Established image transfer pipeline between camera and cloud and controlled robot using IIOT communication.

BookstoreBrew: Interactive E-Commerce Bookstore Platform
Blacksburg, VA

Full Stack Engineer — *08/2023. - 12/2023*

- Created an e-commerce bookstore platform using Vue.js, enhancing user book browsing and purchasing experiences.
- Integrated SQL databases and RESTful APIs, optimizing data handling for real-time inventory and user management.
- Implemented Pinia Store for state management, ensuring a responsive and seamless interaction across the platform.

Automotive perception using car's dashcam
Blacksburg, VA

Software Developer — *08/2022 - 12/2022*

- Implemented Computer Vision based lane detection using Hough Transform, enhancing real-time navigation systems.
- Developed vehicle tracking system employing KLT approach for dynamic traffic management.
- Applied YOLOv4 for accurate pedestrian and vehicle detection in surveillance applications.

Autonomous Indoor Mapping and Navigation system
Blacksburg, VA

Software Developer — *06/2022 - 08/2022*

- Used gmapping SLAM and Kalman filtering for precise indoor Occupancy Grid Mapping using Python with ROS.
- Localized Turtlebot3 with AMCL and Particle filtering; navigated using move_base, navfn, dwa_local_planner.
- Integrated advanced navigation with Kalman and Particle filtering for autonomous indoor exploration and mapping.

Manipulation and Perception System for Fetch Robot
Blacksburg, VA

Project Engineer — *06/2022 - 08/2022*

- Programmed Fetch robot for precise object grasping on tables using ROS and Point Cloud Library.
- Utilized point-cloud perception and Open3D for enhanced robotic object recognition.
- Integrated MoveIt! package for dynamic manipulation planning in ROS simulations.

Tendon Based Actuation for Soft-Robotic Bat head (Senior Design)
Blacksburg, VA

Automation Engineer — *08/2020 - 05/2021*

- Used tendon-based servo actuation for a more robust, ∼28% smaller, and ∼61% lighter Batbot than previous iteration.
- Determined the right actuators needed for project, designed and implemented the actuation mechanism.
- Designed bat pinna/noseleaf in Blender; prototyped with silicone molding for realism.
- Optimized performance by adding DoFs using 13 servo motors, closely mimicking bat movements.
- Determined material properties of molded silicone using Instron machine.

Agbot Challenge (Winner) | Terrestrial Robotics and Control Lab
Blacksburg, VA

Low level controls Engineer — *01/2019 - 05/2019*

- Helped design a control strategy for autonomous soil testing equipment.
- Tasked with performing position and speed control of multiple dynamixel servos and DC motors using C
- Created nodes in ROS, published messages / got notes to subscribe to messages, built ROS packages from source.
- Connected Raspberry Pi and Arduino Mega via ROS for dynamixel, DC motors, and electronics control.

Publications

1). Antonio Alvarez Valdivia, Ritish Shailly, Naman Seth, Francesco Fuentes, Dylan P. Losey, and Laura H. Blumenschein, "Wrapped haptic display for communicating physical robot learning," *IEEE-RAS International Conference on Soft Robotics*, 2022.

2). Antonio Alvarez Valdivia, Soheil Habibian, Carly A. Mendenhall, Francesco Fuentes, Ritish Shailly, Dylan P. Losey, Laura H. Blumenschein, "Wrapping Haptic Displays Around Robot Arms to Communicate Learning," *IEEE Transactions on Haptics*, 2022. **(IEEE Transactions on Haptics Best Application Paper Award 2024)**