Sravan Balaji

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Summary

U.S. Citizen with active security clearance. Experienced roboticist with a strong multi-disciplinary background interested in working on autonomous systems in space, air, ground, and maritime domains.

Work Experience

- **Metron** **Apr. 2023 - Present**

  Software Engineer I - Reston, VA Apr. 2023 – Present

  - Designing autonomous UUV control algorithms, implementing software in C++, testing in simulation, and integrating software onto hardware platforms for in-water testing

- **MITRE** **May 2021 - Mar. 2023**

  Intermediate Autonomous Systems Engineer - McLean, VA Sep. 2022 – Mar. 2023

  - Extended existing simulator functionality to allow for training of multi-agent reinforcement learning systems
  - Implemented terrain extraction from a bounding volume hierarchy data structure for UAV path planning
  - Setup, debugged, and demonstrated sensor reading and capabilities of the Hello Robot Stretch Mobile Manipulator for a healthcare application

  Associate Autonomous Systems Engineer - McLean, VA Jan. 2022 – Sep. 2022

  - Led effort to take global path planning algorithm from research paper pseudo code, to Python prototype, to C++ and ROS implementation on a Clearpath Husky UGV; conducted testing in simulation with Gazebo and on the live platform; successfully able to avoid obstacles while applying desired safety factors
  - Developed an interface in Python to translate existing drone messaging protocols to AirSim API calls for seamless transition to new simulation setup
  - Aided research effort into improving Test & Evaluation of Artificial Intelligence across the DoD

  Graduate Navigation Intern - Remote May 2021 – Aug. 2021

  - Designed and developed approach to identify implicit mitigation links between nodes in a directed acyclic graph for PNT Defense & Threat Library written in Python
  - Revamped and formalized software development process to improve visibility and organization of PNT Assurance project written in Julia
  - Placed 3rd in team-based machine learning intern hackathon; identified malicious URLs based on URL strings and information on age of domain; achieved 0.94 F1 score
  - Placed top 3 in intern AWS DeepRacer challenge; trained reinforcement learning model to control simulated autonomous vehicle around unseen race tracks

- **University of Michigan - Ann Arbor** **Jan. 2021 - Apr. 2021**

  NA 568 Grader - Remote Jan. 2021 – Apr. 2021

  - Graded assignments for NA 568: Mobile Robotics at the University of Michigan - Ann Arbor

- **Rivian** **Jun. 2020 - Aug. 2020**

  ADAS Controls Intern - Remote Jun. 2020 – Aug. 2020

  - Supported creation of Model-in-Loop framework for production controls software components; tested 50 requirements, identified and resolved 7 issues
  - Integrated speed limit algorithm into production controls software for use with Simulink Coder C/C++ code generation; considerations made for embedded system processing limits and time delays
  - Modified MATLAB data processing scripts to work with new test logs; compared performance against requirements and simulation to determine controls parameters to tune

- **Hughes Network Systems** **May 2019 - Aug. 2019**

  Software Development Intern - San Diego, CA May 2019 – Aug. 2019

  - Created Windows GUI app in C# employing .NET framework; automated mobile terminal configuration process to reduce user involvement, prevent errors, and decrease configuration time

- Implemented location based services on terminal software written in C; leveraged MQTT-SN protocol to provide low-cost method of sending GPS data to server

- **University of Michigan - Ann Arbor** **Sep. 2016 - Apr. 2019**

Research Assistant in the Compliant Systems Design Lab - Ann Arbor, MI Jan. 2019 – Apr. 2019

- Formulated and conducted an experiment to investigate applicability of digital image correlation (DIC) for analyzing strain in fiber reinforced elastomeric enclosures (FREEs)
- Manufactured a test setup to securely hold FREEs and control flow of compressed gas
- Created FREEs with varying parameters by hand to investigate their behaviour under pneumatic loads
- Developed a C++ program to analyze creep behavior of a FREE and generate plots

Intramural Sports Supervisor - Ann Arbor, MI Sep. 2017 – Dec. 2018

- Voted Supervisor of the Year by peers for 2017-2018 school year
- Developed an excel macro to automate scheduling supervisor shifts; eliminated issues with transportation of people and equipment present in manual scheduling process
- Supervised intramural sports games at various facilities on campus; evaluated performance of officials to improve customer experience; resolved any disputes that arose

Intramural Sports Official - Ann Arbor, MI Sep. 2016 – Dec. 2018

- Enforced the rules of the game for intramural soccer, flag football, and basketball matches between college students
- Managed flow the game to ensure customer enjoyment and safety

- **Rivian** **May 2017 - Dec. 2018**

Business Technology Intern - Plymouth, MI May 2018 – Dec. 2018

- Championed effort to remove BOM data inconsistencies; developed Excel macro to summarize mass and cost data, alert PMs of incorrect data; resulted in faster detection and resolution of issues
- Introduced and designed an internal website to collect and display data from business systems utilizing Python and Django; worked with REST APIs to present reports of issues by severity
- Led effort to migrate IT team to a new service desk; worked with Jira Service Desk to automate triage and assignment of IT tickets; increased ticket resolution rate within SLA targets from 70% to 95%

Vehicle Integration Intern - Livonia, MI May 2017 – Aug. 2017

- Created system architecture models to distribute and track requirements from system to component level
- Managed requirements in DOORS Next Generation and created custom reports to distribute requirements to sub-teams
- Developed a program in Java to summarize results of simulation; allowed users to modify inputs to see projected results of simulation to avoid additional testing and reduce costs

Education

- **University of Michigan - Ann Arbor** **Sep. 2016 - Dec. 2021**

M.S. in Robotics; Focus in Acting; GPA: 3.982 - Ann Arbor, MI Jan. 2021 – Dec. 2021

- Mobile Robotics; Design of Digital Control Systems; Self Driving Cars; Robotic Systems Lab

B.S.E. in Mechanical Engineering; Focus in Controls; GPA: 3.776 - Ann Arbor, MI Sep. 2016 – Dec. 2020

- Automatic Control; Modeling, Analysis, and Control of Dynamic Systems

B.S.E. in Computer Science; Focus in Intelligent Systems; GPA: 3.776 - Ann Arbor, MI Sep. 2016 – Dec. 2020

- Autonomous Robotics Lab; Machine Learning; Computer Vision

Skills

- **Programming**: C/C++, Python, MATLAB, Julia, JavaScript, C#, Java
- **Development**: GNU/Linux, Git, Docker, Visual Studio Code, GNU Emacs, Vim, JetBrains IDEs
- **Libraries/Frameworks**: ROS, Protocol Buffers, move_base, NumPy, OpenCV, PyTorch
- **Robotics/Autonomy**: Controls, Path Planning, Kalman Filters, SLAM, GPS, Forward & Inverse Kinematics, Machine Learning, Computer Vision
- **Modeling and Manufacturing**: 3D Printing, SolidWorks, CATIA
- **Languages**: English (first language), French (conversational), Tamil (conversational)