Kiron Mateti, Ph.D.

Senior software engineer with 12+ years of experience with defense sensor systems, autonomous guided vehicles, and autonomous semi-trucks. Proven ability to lead multi-functional teams through requirements generation, data processing, and performance metric analysis.

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U.S. Citizen (Male)
linkedin profile

Summary of Qualifications

- 3.5 years experience in the autonomous semi-truck performance verification, responsible for data curation, requirements generation, simulation testing, data processing, metric evaluation and data visualization and reporting
- 4.5 years experience in autonomous guided vehicle systems including hydraulic actuators, AC motors, vehicle localization and positioning, product sensing and placement, and obstacle detection
- 4.5 years experience in electro-optic and infrared systems involving measurement and analysis of optical communication links, night vision goggles, gimbaled infrared sensing systems, and target geolocation

Experience

Senior Software Engineer — September 2021 - Present

Torc Robotics, Inc, Blacksburg, VA

- Developed automated workflows for development teams to verify performance against component and subsystem requirements within the release ODD
- Developed Python interfaces to provide common evaluation and reporting of multiple detection and tracking components, coordinating across multiple teams
- Developed automated reporting for CI/CD regression testing, and datalake connected dashboards to communicate results to engineering leadership
- Involved in safety system verification activities using ISO26262

Lead Perception Engineer — January 2021 - September 2021

John Bean Technologies, Automated Guided Vehicles, Chalfont, PA

- Full life cycle application development: sensor selection, algorithm prototyping, embedded C++ implementation, deployment, and support and documentation
- Developed big-data analysis tools to root cause vehicle performance issues and errors, product placement accuracy, and throughput
- Modeled and simulated dynamics and control of forklift vehicles for lateral and longitudinal control and stability, and hydraulic actuator control

Research Scientist — June 2012 - January 2017

US Navy, Naval Surface Warfare Center (NSWC), Crane, IN

- Developed object tracking algorithms using Matlab, deployed on NVIDIA Jetson TK1 embedded hardware utilizing CUDA C/C++ and OpenCV
- Analyzed, debugged, modeled and simulated electro-optic and infrared sensor system gimbal dynamics, control systems, and target geolocation

Education

Ph.D. in Electrical Engineering May 2012
Pennsylvania State University, University Park, PA

Dissertation Title: *Flapping Wing Mechanisms for Pico Air Vehicle Applications Using Piezoelectric Actuators* (pdf)

Candidacy Areas: State Space Estimation, and Probability and Stochastic Processes

B.S. in Electrical Engineering June 2005
Wright State University, Dayton, OH

Specialization: Robotics and Control Systems, and Digital Signal Processing

Summary of Skills

Programming Languages:

- Python (pandas, numpy, scipy, opencv, awswrangler, plotly, dash), SQL, C++, Matlab/Simulink, LabView

Data Analysis and Visualization:

- ETL processes, Exploratory Data Analysis (EDA), Root Cause Analysis (RCA), performance metric and key performance indicator (KPI) development & analysis, large dataset handling

Robotics and Autonomous Vehicle Technology:

- ODD analysis, Pegasus scenario development, reference frame transformations, sensor calibration, object detection, tracking and fusion, machine learning basics

Systems Engineering:

- Requirements generation and test case development, Verification & Validation (V&V), systems analysis and integration, modeling and simulation, simulation-in-the-loop (SIL), hardware-in-the-loop (HIL)

Cloud Computing and DevOps:

- AWS (Athena, S3, Glue Crawler), Jenkins CI/CD, Docker, Datadog

Software Tools:

- Git, Linux, Bash, ROS, RViz, ROS2, Foxglove (MCAP tooling and Studio), JIRA, Confluence, Jama

Soft Skills:

- Excellent communication and presentation skills, ability to explain high-level concepts to lay people, problem solving mindset, independent handling and prioritization of multiple tasks

Patents and Publications

- Lead inventor on Patent US 9,599,532, for wearable optical communication devices
- Lead inventor on Patent US 9,602,203, for vibration characterization methods for optics
- Co-inventor on Patent US 10,670,687, for night-vision goggle effectiveness measurement
- Published 13 articles in IEEE/ASME journals/conferences, (researchgate.net)