Kevin Robb

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Education

Northeastern University, Boston, MA — 2021–Present
Candidate for M.S. Robotics, with CS Concentration
Related courses: Mobile Robotics, Robot Sensing & Navigation

The University of Oklahoma, Norman, OK — 2017–2021
B.S. Engineering Physics, B.S. Mathematics | Summa cum Laude
Related courses: Applied Statistical Methods, Abstract Linear Algebra

Skills

C++, Python, MATLAB, JavaScript, Java, R, Bash, Ubuntu Linux, Git, ROS, LaTeX
Bayesian Filtering (Kalman Filter, EKF, UKF, Particle Filter), Localization, SLAM, Linear Algebra
Computer Vision, Probabilistic Robotics, Motion Planning, Genetic Algorithms, Sensor Fusion

Experience

Piaggio Fast Forward (PFF), Perception & Autonomy Team
Robotics Software Engineering Intern — 2022–Present
- Developed dynamic localization and path-planning components from the ground-up for a new autonomous behavior on the *gitamini* consumer mobile robot. (C++)
- Implemented new features into a large existing software architecture with multiple contributors.
- Integrated "ground truth" data from OptiTrack motion capture studio into visualizations of robot data for simulating & verifying new algorithms. (Python)

Robotics, Evolution, Adaptation, and Learning Laboratory (REAL Lab)
NSF Research Assistant with Dr. Dean Hougen — 2018–2021
- Applied evolutionary computation techniques to optimize Kalman Filter parameters for a simulated mobile robot in changing environments (outperforming manual tuning). (Python)
- Characterized the relationship between nurturing and risk in a simulated population. (Java)
- Published a paper in THURJ, a student journal at the University of Oklahoma.

Office of Admissions & Recruitment, University of Oklahoma
Campus Tour Guide | Team Lead — 2018–2021
- Led general walking tours and personalized visits for prospective students and families.
- Delegated tasks on shift, oversaw interviews, and trained new guides.

Projects

EKF-SLAM Implementation (Personal Project) — Summer 2022
- Created custom simulator for a 2D mobile robot in ROS Noetic. (Python)
- Derived & implemented both EKF & UKF to perform online landmark-based SLAM. (C++)
- Integrated path planning & navigation architecture to explore the environment. (Python)

Intelligent Ground Vehicle Competition (IGVC), Auto-Nav Challenge — 2020–2021
- Led a team of students in building a 2'×3'×3' autonomous vehicle.
- Developed an EKF to fuse incoming GPS, IMU, and encoder data with motor commands to perform online mobile robot localization. (C++)
- Detected safe drivable area (free of lanes & obstacles) with RGB camera and LiDAR.
- Designed physical chassis to be extremely modular for quick reassembly after transport.
- Made in CAD & 3D-printed several parts (e.g., sensor mounts) for use on the robot.
- Won 1st place and Rookie of the Year at the 2021 IGVC.

National Robotics Challenge (NRC), Autonomous Vehicle Competition — 2019–2020
- Constructed ROS architecture for a small custom "race car" platform that was able to complete a known course autonomously in minimal time.
- Made system to generate trajectories and navigate using Pure Pursuit. (Python)
- Implemented a PID controller to smooth & publish motor commands. (Python)