Senior SLAM Engineer

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Professional Summary

Senior SLAM Engineer with 7+ years of professional experience in C++ robotics software development, specializing in LiDAR-based SLAM, state estimation, and sensor fusion. Strong background in graph optimization, Lie algebra, and multi-sensor systems (GNSS, IMU, INS, wheel odometry). Experienced in modern C++, ROS/ROS2, Docker, and scalable software architectures for production robotics systems and technical leadership.

Technical Skills

- **Programming Languages:** C++ (7+ years), Python, Rust
- **Robotics & SLAM:** LiDAR SLAM, Visual SLAM, Graph Optimization, Sensor Fusion
- **State Estimation:** Kalman Filters, Factor Graphs, Lie Algebra (SE(3)), Manifolds, Covariance Propagation & Estimation
- **Robotics Frameworks:** ROS, ROS2, DART, Pinocchio, TSID
- **Software Engineering:** Architecture, Multithreading, Design Patterns, Docker, CI/CD
- **Control & Planning:** Cartesian & Joint Control, Dynamic Programming, Trajectory Planning
- **Simulation & Visualization:** ImGui, Gazebo, WebGL, OpenGL

Work Experience

Senior SLAM Engineer – Kudan Limited & Kudan Inc., Bristol, UK & Tokyo, JP

Jun 2024 -- Present (Full Time)

- Lead design and implementation of major epics within a SAFe framework with emphasis on software architecture
- Translate state-of-the-art academic research on IMU filtering into production code, solving the problem of SLAM in tunnels
- Apply advanced state estimation techniques using SE(3) Lie algebra and covariance analysis
- Produce technical documentation and support onboarding of new engineers
- Perform in-depth code reviews and promote modern C++ standards

SLAM Engineer – Kudan Limited & Kudan Inc., Bristol, UK & Tokyo, JP

Jun 2022 -- May 2024 (Full Time)

- Develop and maintain a production-grade C++ 3D LiDAR SLAM library
- Design and implement core SLAM algorithms, including graph optimization and sensor fusion
- Integrate multi-sensor data (GNSS, IMU, INS, wheel odometry) to improve robustness
- Develop internal GUI and CLI tools to improve developer productivity
- Containerize systems using Docker and support scalable deployment
- Produce detailed analysis of the failure points of the system and propose algorithmic solutions.

Robotics Software Engineer – INRIA, National Institute for Research in Digital Science and Technology

Oct 2020 -- Apr 2022 (Full Time)
- Design and develop the entire software layer from scratch for a teleoperation system of an industrial robot in hazardous environments
- Implement each pipeline module in C++, containerize it with Docker, and integrate it using ROS
- Model real robot dynamics using simulation libraries to achieve precise control
- Set-up an URDF-based digital twin of the robot in the environment to use as simulation module
- Write a controller to move the robot in both Cartesian and joint space
- Create a teleoperation GUI which allows to interface both with the simulation and with the real robot
- Gain hands-on experience with control laws on humanoid robots used in the lab through dynamic programming
- Contribute to the publication of the paper: "Teleoperating a robot for removing asbestos tiles on roofs: insights from a pilot study" published at IEEE ARSO 2023 (Berlin)

Back-end software engineer – Translated

Mar 2016 -- Jul 2016 (Full Time)
- Maintain and improve the codebase of a web application in PHP
- Add unit tests increasing the code coverage of the core application logic of 200%

Education

MScEng – Master's in Artificial Intelligence and Robotics – La Sapienza, University of Rome

2016 -- 2019
- Strong focus on SLAM, autonomous navigation, and filtering
- Applied theoretical concepts in hands-on projects from kinematics, dynamics, AI, and controls
- Develop a 3D LiDAR SLAM system in C++ as thesis : "Position tracking using high order primitives"

Bachelor of Science – Computer Engineering – Roma Tre University

2013 -- 2016
Write a thesis about increasing the code coverage of a web application: "Unit testing avoiding regression in CI"

Projects

- **Spiking convolutional neural network for image classification** – custom Tensorflow layer
- **Chess endgames engine on simpler chessboard** – Reinforcement Learning, Markovian process
- **Maximise field of view coverage of multiple surveillance cameras** – multi agent, C++
- **Hex game** – Rust, simulation, CI/CD with GitHub actions
- **Conway's Game of Life** – Rust, simulation, visualisation