

Junior Sundar

LEAD ENGINEER · SENIOR SYSTEM INTEGRATION ENGINEER · ROBOTICS (SOFTWARE) ENGINEER

✉ juniorsundar@gmail.com 🌐 juniorsundar 🌐 Junior Sundar

Professional Brief

- Lead Engineer with specialisation in Robotics with over 5 years of professional experience with a thorough understanding of cyber-physical systems, applied knowledge in robotic systems design, algorithms in autonomy and artificial intelligence, computer vision, and machine learning.
- Highly adaptive to organisation specific processes with a proven track record in leading continuous integration and deployment projects to consistently achieve deliverable requirements and deadlines.
- Highly result-oriented and effective interface management skills, with an enthusiastic learner's mindset.
- Seeking challenging opportunities in the field of mechatronics and automation across diverse industry domains.

Experience

Lead Engineer

Abu Dhabi, U.A.E.

TECHNOLOGY INNOVATION INSTITUTE

October 2025 - Present

- Lead the integration of the team's first module into the department-wide UxV mission controller by managing seven engineers and researchers under Agile principles.
- Coordinate with ML researchers to design UAV data collection experiments for system-monitoring and predictive behavioral analysis models.
- Oversee in-house test flights and coordinate with sub-contractors to gather over twenty hours of varied flight data.
- Manage collaborative projects with university partners to ensure alignment with internal roadmap requirements.
- Integrate novel robotics platform (quadrupeds, UGVs, etc.) into in-house mission management stack.

Skills: Agile Software Development · Project Lead · Technical Writing

Hardware: Unitree Go2 Quadruped

Software: JIRA

Senior System Integration Engineer

Abu Dhabi, U.A.E.

TECHNOLOGY INNOVATION INSTITUTE

September 2024 - October 2025

- Designed and developed a novel ROS 2 framework from scratch to enable platform-agnostic control barrier function plugins for UxV mission control.
- Ensured software robustness with blackbox systems and established a CI/CD pipeline with custom runners and multi-architecture builds.
- Served as the primary contact for team-wide integration projects leveraging NixOS and Docker for the mission controller stack.
- Delivered comprehensive documentation and performed integration testing to validate system stability.

Skills: C++ · Go · Nix · CI/CD · Integration Testing · Control Barrier Functions · SITL/HITL · Quadrotor Piloting · Design of Experiment

Hardware: Quadrotors (Holybro x500, T-Motor M690B) · Agile Scout Mini · Pixhawk Flight Controller · NVIDIA Jetson Orin NX

Software: ROS 2 · Gazebo Simulation · Docker · Nav2 · PX4-Autopilot · Linux (NixOS, Ubuntu) · Virtualisation (VM) · GitHub Actions

Robotics Engineer

Abu Dhabi, U.A.E.

UNIKIE MEA LIMITED

October 2023 - September 2024

- Work closely with clients in securing multi-agent, aerial systems, moving towards safe, level-5 autonomy.
- Built and deployed quadcopters from scratch running on proprietary flight controller hardware and firmware (a derivative of Pixhawk series flight controllers and PX4-Autopilot) and mission control stack.
- Coordinated experiments to collect over six hours of drone flight data of normal and anomalous missions to build a comprehensive dataset for training machine learning models.
- Developed and deployed API to inject faults into drone flight controller dynamically during runtime to emulate behaviour under fault.
- Developed and deployed fully automated software-in-the-loop (SITL) and semi-automated hardware-in-the-loop (HITL) framework to collect simulated drone flight data with and without fault injection for randomised flight missions and fault types.

Skills: Python · C++ · SITL/HITL · Quadrotor Piloting · Data Collection for Machine-Learning · Fault Injection

Hardware: Quadrotors (Holybro x500, T-Motor M690B) · Pixhawk Flight Controller · NVIDIA Jetson Orin NX · Raspberry Pi

Software: ROS 2 · Gazebo Simulation · PX4-Autopilot · Linux (Ubuntu)

Robotics Engineer

Delft, Netherlands

HONEST AGTECH B.V.

May 2023 - July 2023

- Applied robotics solutions to automate agricultural processes in greenhouses using UR robotic platform.

- Applied computer vision and obstacle detection methods with image segmentation and identification algorithms (Neural Networks) to differentiate between plant attributes to optimise path-planning in a sensitive workspace.
- Performed Site Reliability Engineering (SRE) for an automated UV disinfecting bot in greenhouses.
- Applied Agile software development principles to deliver testable and scalable results to ensure that a reliable product is delivered to the customer.

Skills: Python · C++ · Path/Motion Planning · Computer Vision · Site Reliability Engineering · Agile Software Development

Hardware: Robotic Manipulators (UR5e)

Software: ROS 1 · MoveIt · Gazebo Simulation · Octomaps · PointCloud Library · OpenCV · Linux (Ubuntu) · JIRA

Robotics Software Engineer

Sharjah, U.A.E.

MARIA MEDICAL TECHNOLOGY

August 2021 - April 2023

- Applied robotics solutions to automate laser aesthetic devices with UR and Omron TM robot platforms.
- Conceptualised medical device automation solutions on ROS framework, including computer-vision and perception systems, path-planning, and machine learning principles.
- Developed hardware-software interface for Vention linear belt-actuator with MQTT network protocol.
- Prototyped and manufactured modular tools for medical devices using 3D printing technology.

Skills: Python · C++ · Path/Motion Planning · Computer Vision · Image Segmentation · 3D Printing

Hardware: UR5e · TM500 · Vention Linear Belt-Actuator · Creality FDM and Resin Printers · Intel Realsense RGBD Camera

Software: ROS 1 · MoveIt · Gazebo Simulation · Octomaps · PointCloud Library · OpenCV · Open3D · Mediapipe · CAD (FreeCAD · Solidworks) · Linux (Ubuntu) · MQTT

Projects

OxMPL - Oxidised Motion-Planning Library

 juniorsundar/oxmpl

DEVELOPER/MAINTAINER OF MOTION-PLANNING LIBRARY WRITTEN IN RUST

May 2024 - Present

All-in-One PX4 Log Tool

 tiuae/px4-log-tool

DEVELOPER/MAINTAINER OF PX4 LOG-HANDLING CLI TOOL WRITTEN IN PYTHON

May 2024 - Present

Roam and Agenda in Neorg

 juniorsundar/neorg-extras

DEVELOPER/MAINTAINER OF NEOVIM PLUGIN WRITTEN IN LUA

August 2024 - March 2025

Professional Certification

Introduction to Concurrent Programming with GPUs

BY JOHNS HOPKINS UNIVERSITY ON COURSERA

May 2025

Google Data Analytics Specialization

BY GOOGLE ON COURSERA

August 2023

Publications

Secure Safety Filter: Towards Safe Flight Control under Sensor Attacks

IROS: INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS

October 2025

Critical Sensor Failure Analysis for Proactive Mitigation in Secure System-on-Chip for UAVs

SSH-SOC: SAFETY AND SECURITY IN HETEROGENEOUS OPEN SYSTEM-ON-CHIP PLATFORMS

June 2024

Education

University of Colorado Boulder

Boulder CO, U.S.A.

M.S. IN MECHANICAL ENGINEERING

August 2019 - May 2021

- **Computer Science:** Coordinated Control of Multi-Agent Systems. Algorithmic Motion Planning.
- **Control Systems:** Feedback Control. Linear Control Systems. Statistical Estimation of Dynamical Systems. Digital Controls.
- **Mechanical Engineering:** Microsystems Integration. Mathematics for Mechanical Engineering.
- **Robotics:** Algorithmic Foundations of Human-Robot Interactions. Mechatronics and Robotics. Modeling of Human Movement.

Heriot-Watt University

Dubai, U.A.E.

B.ENG. (HONS) IN MECHANICAL ENGINEERING

September 2016 - July 2021

Languages

Programming

Python, C++, Rust, Nix, Go, Lua

Spoken

English, Hindi, Spanish, Tamil, Malayalam