

SOUVIK DATTA

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EDUCATION

National University of Singapore

Master of Science in **Electrical Engineering**

GPA: 4.06/5

Singapore

Aug 2024 – June 2026

Vellore Institute of Technology

Bachelor of Technology in **Electrical and Electronics Engineering**

CGPA: 8.55/10

Chennai, India

July 2019 – May 2023

WORK EXPERIENCE

Research Intern

Jan 2026 – Present

Temasek Laboratories, NUS

- Developed and deployed AirIMU, a learning-based inertial odometry model for UAV state estimation using only IMU data.
- Integrated the AirIMU model with PX4 flight control system, enabling real-time IMU correction within a closed-loop AI-EKF pipeline.
- Future work includes hardware-in-the-loop (HITL) tests and real UAV flight trials for long-term navigation stability.

Software Developer

Feb 2023 – Jun 2024

Q Blocks, New Delhi

- Developed scalable APIs using Python to support Generative AI models for image and speech processing, delivering services to over 10K active users.
- Optimized image inference models using DeepCache, achieving a 45% reduction in latency and lowering operational costs by 50%, contributing to \$20K+ in monthly recurring revenue from B2B clients.
- Co-developed a Python pip package providing streamlined access to public APIs for AI model deployment, achieving 50K+ downloads within six months, enhancing developer adoption and usability.

UAV Project Intern

Dec 2022 – Apr 2023

PT Kaltim Prima Coal (KPC), Indonesia

- Led the integration of UAV-based thermal imaging for 70kV high-voltage line inspections, identifying critical faults early and preventing outages, resulting in a \$1.26M increase in annual revenue.
- Optimized UAV flight paths and inspection protocols, reducing transmission pole inspection time from 72 to 14 man-days, increasing operational efficiency by 80%.

Computer Vision Intern

Jan 2022 – Jul 2022

Omnipresent Robot Technologies, New Delhi

- Developed and deployed YOLOv5 object detection pipelines over six unique object classes, achieving a high F1 Score of 93.5% for drone-based analytics in industrial environments.
- Enhanced multi-spectral image processing by integrating k-means clustering to improve anomaly detection by 54%, leading to more accurate environmental monitoring and change detection.
- Improved UAV object tracking data visualization by 14% through custom Python scripts using Geocoding APIs and Folium, enabling more efficient mapping and reporting for field operations.

SKILLS

Languages: Python, MATLAB/Simulink, Docker

Libraries: OpenCV, scikit-learn, TensorFlow, Keras, PyTorch

Software: Gazebo, ROS-1

Environment: Git/GitHub, Linux, Raspbian OS

Hardware: Arduino, Raspberry Pi, esp8266

PROJECTS

Spiral Path Robot Navigation in Cave | NumPy, Open3D | [\[CODE\]](#)

| Robotics

- Engineered a PID-controlled robotic descent system, achieving a 35-40% improvement in trajectory stability by carefully tuning Kp, Ki, and Kd parameters to mitigate oscillations and maintain safe distances from cave walls.

- Developed a 3D reconstruction model using LiDAR and Open3D, incorporating Perlin noise to replicate natural cave structures and enhance the robot's internal mapping capabilities, with potential applications for extraterrestrial cave exploration.

State Estimation using Kalman Filter | NumPy, Matplotlib | [\[CODE\]](#) | Kalman Filter

- Developed a Kalman Filter model to estimate a bot's position & velocity in real-time from noisy data.
- Achieved Mean Square Error of 2.8% for position & 1.1% for velocity, ensuring high precision Visualized the filter's performance using Matplotlib, comparing estimated & ground truth values for validation.

3D Point Cloud from Depth Map | Open3D, Keras, OpenCV | [\[CODE\]](#) | Computer Vision

- Produced 3D point cloud data maps from 2D monocular RGB image-based depth maps using Open3D functions.

IoT Book Bot | Arduino, OpenCV, Raspberry Pi | [\[CODE\]](#) | Robotics

- Engineered a mobile robot using Raspberry Pi, Arduino and esp8266 for IoT Navigation and Object Detection.

EXTRA-CURRICULARS

1. Achieved an outstanding 10th All India Rank (out of 76 teams) in the Electric BAJA SAE, 2022. [\[Certificate\]](#)
2. Secured 1st position out of 30 teams in the prestigious Aerospace Quiz League conducted by VIT. [\[Certificate\]](#)
3. Discovered 3 asteroids as part of NASA International Astronomical Search Collaboration, 2021. [\[Certificate\]](#)

VOLUNTEERTING

Graduate Assistant, [EE3305, EE4308, EE4311, EE4312] , ECE Department (NUS) –

- Mentored 100+ students during robotics and AI lab sessions, troubleshooting hardware and software issues.
- Assembled 20+ TurtleBot robots and experimental arenas to support autonomous navigation experiments.
- Evaluated 100+ student submissions by executing Python / MATLAB code & verifying simulation results.
- Managed laboratory hardware distribution and resolved configuration issues during lab practical sessions.

Finance Secretary, Youth Red Cross (VIT) –

- Led a fund-raising drive, raising \$1,500+ to provide over 500 meals for disadvantaged children in Chennai.
- Managed a \$1,000 fund-raising initiative, providing food and care to 650+ community animals across India.
- Led a book donation drive, distributing 2,500+ books to 200+ underprivileged children in North Bengal.
- Organized 10+ webinars on social issues, engaging 300+ students on topics like mental health & sanitation.

PUBLICATIONS

1. **S. Datta**, M. Kundu, R. D. Choudhury, S. P. and S. VT, “**IoT Book Bot**”, 2022 IEEE India Council International Subsections Conference (INDISCON), 2022, pp. 1-6. | [\[Certificate\]](#) | [\[arXiv\]](#) | [\[IEEE Xplore\]](#)
2. **Datta, S.**, Sriramalakshmi, P. (2023). “**Two-Stage Boost Inverter for Wave Energy Conversion**”. In: Doolla, S., Rather, Z.H., Ramadesigan, V. (eds) Advances in Renewable Energy and Its Grid Integration. ICAER 2022. Lecture Notes in Electrical Engineering, vol 1041. Springer, Singapore | [\[Certificate\]](#) | [\[Springer\]](#) | [\[DOI\]](#) | [\[PPT\]](#)
3. S. Datta, R. Bharatwaj, Subbulekshmi D., D T. and A S., “Semi-Supervised Learning for Autonomous Navigation”, International Conference on Data Analytics and Computing (ICDAC). Wenzhou, China, May, 2022. | [\[Certificate\]](#) | [\[Abstract\]](#) | [\[PPT\]](#)

CERTIFICATES AND MOOCs

1. **Neural Networks and Deep Learning** — DeepLearning.AI - Coursera | [\[Certificate\]](#) | [\[GitHub\]](#)
Learned key NN concepts such as Optimizers, Loss functions, Activation functions, Backpropagation etc.
2. **Robotics: Aerial Robotics** — University of Pennsylvania - Coursera | [\[Certificate\]](#) | [\[GitHub\]](#)
Studied essential concepts such as quadcopter kinematics, trajectory tracking, and motion planning strategies.
3. **Machine Learning** — Stanford University - Coursera | [\[Certificate\]](#) | [\[GitHub\]](#)
Mastered key ML topics like Linear Algebra, Statistics, Probability, Cost Functions using MATLAB scripts.
4. **Self-Driving Cars** — University of Toronto - Coursera | [\[Certificate\]](#) | [\[GitHub\]](#)
Grasped prime autonomy concepts like visual perception, localization, state estimation etc. using CARLA.