

# SOUVIK DATTA

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## EDUCATION

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**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

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**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

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**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

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**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

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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

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**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

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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

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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.
5. **3D Computer Vision by Dr. Gim Hee Lee** – National University of Singapore  
Studied crucial concepts like 3D Geometry, Pose Estimation, Multi-View Stereo, Camera Calibration etc.