DEEPAK ANANTHAPADMAN

Mechanical Engineer | Robotics & Automation Specialist

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Portfolio | LinkedIn | GitHub

Summary

A proactive Mechanical Engineer and recent **MSc Advanced Robotics graduate (Distinction)** specializing in **AI, Machine Learning, Computer Vision**, and advanced **Control Systems**. Possesses hands-on experience in **full-cycle project management** and designing **turnkey automation solutions** for major global clients. Skilled in applying **deep learning, predictive modeling**, and sophisticated **simulation** to solve complex problems in robotics, aviation, and healthcare.

Education

Masters in Advanced Robotics, Distinction **2024–2025**
Queen Mary University of London *London, UK*
- **Thesis:** Multi-Modal AI 6D Pose Recognition for Robotic Manipulation.

Bachelor of Mechanical Engineering, First Class **2019–2023**
Anna University *India*

Academic & Personal Projects

MSc Thesis: Multi-modal AI 6D Pose Recognition
- Developed a complete end-to-end system for **6D pose estimation**, designing a 4-stage modular pipeline that integrates **deep learning (YOLOv8)** with geometric **computer vision (PCA, RGB-D fusion)** and **Meta AI's MCC (Multiview Compressive Coding for 3D Reconstruction)**.
- Achieved industry-ready, **real-time performance (49.2ms / 20.3 FPS)** with high precision (**±2mm position, ±0.1° orientation**) and robust detection (**100% rate**).
- **Impact:** Resolved a key trade-off between speed and accuracy in 6D pose estimation, creating a practical solution with direct applications in industrial automation for pick-and-place and quality control.
- **Source Code**

Machine Learning System for Aircraft Taxi Time Prediction
- Developed a machine learning system to predict aircraft taxi times, implementing both a custom-built **neural network** and an **Adaptive Neuro-Fuzzy Inference System (ANFIS)**.
- **Impact:** Created a predictive tool to enhance airport operational efficiency, achieving a low prediction error (**RMSE of 4.05 minutes**) with the ANFIS model.
- **Source Code**

Deep Learning for Medical Image Classification
- Developed a deep learning system for automated coronary artery lesion classification from 3,700 Optical Coherence Tomography (OCT) images using **DenseNet121** and **transfer learning**.
- **Impact:** Created a production-ready system with pre-trained models, achieving **90.3% test accuracy** and providing a valuable tool for clinical decision support in cardiology.
- **Source Code**

Modern Robotics Control Systems & Dynamic Simulation Platform
- Developed an advanced robotics simulation platform using **MATLAB/Simulink** featuring **computed torque control** and dynamic compensation, achieving **<2% tracking error**.
- **Impact:** Created a high-fidelity, scalable simulation platform for designing, testing, and validating advanced control algorithms for robotic systems.
- **Source Code**

Cognitive Robotics System for Elderly Healthcare Monitoring
- Developed a real-time monitoring system using a **multi-modal computer vision** pipeline (**MediaPipe**) and a **Random Forest Classifier** to detect and alert on high-risk activities.
- **Impact:** Created a **low-latency (<100ms)** system to improve patient safety through automated monitoring, processing video at **~20 FPS** on standard hardware.
- **Source Code**

Professional Projects | BGR Neo (Startup)

Heavy Machinery Assembly
- Designed an **automated assembly solution** for a leading construction equipment manufacturer's multi-terrain loaders, focusing on the **robotic assembly** of the vehicle's track system.
- **Impact:** Provided a critical automation solution for a key assembly process, addressing the challenges of safely and consistently handling heavy-duty components.

HVAC Assembly & Packaging Automation
- Engineered comprehensive solutions for major HVAC manufacturers, from **end-of-line (EOL) robotic packaging** to **full assembly line automation**.
- **Impact:** Delivered versatile EOL and full-line automation systems, enabling clients to scale production and improve packaging consistency.

Turnkey Automation for a Global Industrial Technology Leader
- Designed and delivered a complete battery pack assembly line, integrating **6-DOF, gantry, and SCARA robots**.
- **Impact:** Engineered a complete, multi-robot assembly line from the ground up, providing the client with a fully integrated and automated production capability.

Robotic Debagging System for a Global Beverage Leader
- Engineered a **turnkey robotic solution** to handle 50kg raw material bags, achieving a **120-second cycle time**.
- **Impact:** Replaced a strenuous 4-person manual process, automated a key raw material bottleneck to boost production, and created a scalable solution planned for nationwide rollout.

Work Experience

Application & Sales Engineer | *BGR Neo Robotics & Automation (Startup)* **Aug 2023 – Aug 2024**
- Led **robotic process automation (RPA)** projects, ensuring client specification compliance and enhancing production efficiency by **10%**.
- Managed the **full project lifecycle** using **Agile methodologies**, strengthening client relationships and achieving a **20% increase** in project success metrics.
- Generated **150+ new business leads** and bolstered brand visibility by designing the company brochure, directing the corporate video, and managing the exhibition at the 2024 India Warehousing Show.
- Contributed to a high-growth phase where the company achieved a **153.15% increase in EBITDA** and a **127.93% rise in book net worth** during the 2024 fiscal year.

Design Engineer Intern | *BGR Neo Robotics & Automation (Startup)* **May 2023 – July 2023**
- Focused on 3D modeling and simulation with SolidWorks, enhancing robotic solutions and automation skills.

Project Engineer Intern | *Accurate Steel Forging Pvt Ltd* **March 2023 – April 2023**
- Analyzed manufacturing processes and recommended improvements that boosted production efficiency by **10%**.

Skills

Programming	Python, C, C++, MATLAB
AI & Data Science	PyTorch, TensorFlow, Keras, Scikit-learn, Pandas, NumPy, Scikit-fuzzy, Open3D, MediaPipe
Robotics & Simulation	ROS 2, Nvidia Isaac Sim, Nvidia Omniverse, Gazebo, CoppeliaSim, Simulink, SolidWorks, ABB RoboStudio, AutoCAD, Robotics System Toolbox
Core Competencies	Machine Learning, Deep Learning, Predictive Modeling, ANFIS (Neuro-Fuzzy Systems), 6D Pose Estimation, Control Systems, Computer Vision, PLC, SCADA
Robotic Hardware	ABB, Kawasaki, Kuka, FANUC Controllers
Professional	Project Lifecycle Management, Agile Methodologies, Client Engagement, RFQ & Cost Analysis