# Santhosh Kumar

*Computer Vision Engineer / Deep Learning / AI/ML*

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## Career Objective

Computer Vision Engineer with an M.Tech in Artificial Intelligence and 4+ years of professional experience developing and deploying vision-based models for robotics, mobility, and intelligent systems. Skilled in object detection, image segmentation, and real-time video analytics using Python, PyTorch, TensorFlow, and OpenCV. Experienced in bridging AI with autonomous systems and digital twin technologies, bringing a strong foundation in software engineering discipline and applied AI innovation. Seeking to contribute to cutting-edge computer vision solutions that advance safety, automation, and human–machine collaboration.

## Technical Skills

- **Programming Languages:** Python
- **Libraries and Frameworks:** PyTorch, TensorFlow, OpenCV, pandas, NumPy, scikit-learn, Matplotlib, Seaborn, Ultralytics
- **AI/ML:** CNNs, Transformers, Prompt Engineering, OCR, Traditional ML
- **Statistics and Math:** Descriptive Statistics, Probability, Hypothesis Testing, Regression Analysis, Linear Algebra
- **Data Handling and Preprocessing:** Data Cleaning, Feature Engineering, Data Encoding, Scaling, Missing Value Imputation
- **Visualization Tools:** Matplotlib, Seaborn, Tableau (Advanced)
- **Tools and Platforms:** Jupyter Notebook, PyCharm, VS Code, Git, Google Colab, Office 365

## Soft Skills

- Logical Reasoning and Problem-solving
- Resilience and Adaptability
- Strategic thinking
- Product-mindedness
- Goal-orientation and Ambitious

## Experience

**Automation Engineer**
**Baxter International Inc.** — *2023 to 2025*

- Configured and validated Doosan robotic systems for production-grade automation setups, ensuring seamless integration and workflow optimisation.
- Transformed manual test cases into automation scripts, improving cross-device reliability and reducing release cycles.
- Diagnosed and resolved automation failures through root cause analysis, contributing to system stability and continuous improvement.
- Collaborated with senior engineers on computer vision and deep learning projects, gaining hands-on exposure to CNN pipelines, OCR (Tesseract), and NLP models for industrial document analysis.
- Supported deployment and testing of AI models on Orion board and DGX servers, learning quantization and inference optimization techniques for real-time applications.
- Tools used: MicroFocus ALM, Visual Studio Code, Office 365, Git, ROS

**Developer / Performance Tester**
**Ford IT – Global (via HCL Technologies)** — *Oct 2021 to Nov 2022*

- Developed backend logic and UI components for Ford Master application, contributing to enterprise-grade software delivery
- Executed performance testing across CI/CD pipelines, ensuring system reliability up to pre-production environments
- Provided L4 technical support and database monitoring in production, resolving customer-facing issues and maintaining uptime
- Tools used: Git, Jenkins, Microsoft SQL Studio, Visual Studio Code, Postman

## Projects

Completed hands-on projects across core AI/ML subjects as part of the MTech curriculum, each designed to simulate real-world data science workflows. Topics include:

- **Deep Learning and Computer Vision:** CNNs, object detection, Image classification
- **Statistics for ML:** Hypothesis testing, Regression diagnostics
- **Unsupervised Learning:** Clustering, Dimensionality reduction
- **Time Series Forecasting:** ARIMA, Seasonal decomposition

*All projects available on GitHub:* github.com/SK_0920

## Education

**MTech - Artificial Intelligence**, SRM University of Science and Technology    June 2022 – May 2025
- Academic score: CGPA - 8.6

**BE - Mechatronics Enginering**, Chennai Institute of Technology    March 2017 – July 2021
- Academic score: CGPA - 8.1

## Publications

**Advancing Motorbike Safety through Image Processing and YOLO-Based Object Detection in Challenging Conditions**    Jan-May 2025

- Developed an innovative AI-driven bike safety system to protect riders navigating India's challenging roads. SmartShield processes real-time camera feeds to detect potholes, speed bumps, and vehicles with 90 percent accuracy, even in heavy rain, fog, or at nighttime. The system combines YOLOv8 for obstacle detection, ResNet-18 for weather classification, and U-Net/MiDaS for image enhancement and depth estimation, issuing warnings for hazards within a 5-metre danger zone. Built with Python, OpenCV, and PyTorch, it's optimised for low-cost deployment on Raspberry Pi, making advanced safety accessible to economical riders.
- Tools Used: Python, OpenCV, TensorFlow, PyTorch, YOLOv8, ResNet-18, U-Net, MiDaS, Image processing, Monocular Depth Estimation, Git

*Paper Link:* IEEE_Published_Paper

## Certifications

- Computer Vision for Data Scientists
- Deep Learning with TensorFlow: Insights and Innovations
- Advanced AI: Transformers for Computer Vision
- Hands-On AI: Computer Vision Projects with Ultralytics and OpenCV
- Deep Learning and Computer Vision: Object Detection with PyTorch
- Hands-On Introduction to Transformers for Computer Vision
- MLOps Essentials: Model Deployment and Monitoring

*Certifications link:* click here

## Additional Information

- Languages – English, Tamil
- Location - India (Open to relocation or remote roles)
- Notice Period: Immediately available