Surajit Dutta Software Developer | Machine Learning Expert

Ph: +49 170 9372197 | **Email:** Surajit.Dutta39@gmail.com | **LinkedIn:** https://www.linkedin.com/in/surajitdutta39
Address: Weingärten 23, 31134 Hildesheim, Germany | **DOB:** 09.02.1989 | **Nationality:** Indian

SKILLS

Programming Languages: C/C++, Python, MATLAB, Bash
Tools/APIs: TensorFlow, OpenCV, OpenMP, GoogleTest, pytest, Doxygen, LaTeX, Git, Docker, Jenkins
Platforms: Linux, Azure
Domains: Computer Vision, Machine Learning, Deep Learning
Languages: English, German (basic), Hindi, Bengali

WORK EXPERIENCE

Robert Bosch GmbH
Software Developer – *Advanced Vision based Object Detection with Deep Learning* Oct 2023 – Present, Germany

- Contributed to the development of next-gen vision based object detection using C++, Python, TensorFlow
- Implemented unit tests using pytest to ensure robustness and reliability of the implemented functionalities
- Optimized detector-architecture for hardware compatibility and evaluated performance through many experiments
- Trained and fine-tuned ML models on self-hosted high-performance clusters
- Pre-labelled data with finetuning and inferencing deep foundation models in Azure for scalable annotation workflows
- Led global teams in integrating advanced object detection features into production pipelines and optimizing workflows

Career Break – *Parental leave for 6 months* Apr 2023 – Sep 2023

Software Developer – *Vision-Based Object Detection for ADAS series software* Apr 2016 – Apr 2023, Germany

- Developed and enhanced ML algorithms for VRU object detection/classification, data augmentation (such as luminance adjustment, geometric distortion, motion blur etc.), using C/C++, OpenCV, OpenMP etc. for core functions, Python for tooling and GoogleTest for test driven development
- Enhanced a Python based evaluation framework with custom metrics (e.g., class/distance-specific ROC, Precision/Recall), tables, visualization, etc. to analyze and improve VRU detection performance
- Conducted extensive experiments and grid-searched hyperparameters to optimize model performance
- Trained, finetuned, maintained scalable vision models for ADAS series software and optimized for hardware deployment
- Implemented toolchain for data classification, selection, clustering, using deep foundation model to reduce the data preparation effort by 80%
- Reduced classifier delivery time by 50% through Jenkins based CI/CD pipelines using Groovy, Python, and Bash
- Developed tools to identify edge cases and false positives, integrating them into retraining workflows
- Mentored interns and guided global teams on implementing advanced workflows and scalable ML solutions

CMORE Automotive GmbH
Computer Vision Engineer Apr 2015 – Oct 2015, Germany

- Developed an image auto-labeling tool, using C++, OpenCV, and Python, achieving near-human accuracy
- Developed pipelines for the labelling loop, i.e., pre-labelling, manual correction, finetuning ML model
- Optimized label delivery workflows for Tier 1 ADAS suppliers

Continental AG
Master Thesis – *Runtime-Efficient SVM for Pedestrian Detection* Nov 2014 – Apr 2015, Germany

- Developed runtime-efficient SVM models using C++, OpenMP, SIMD intrinsic
- Optimized SVM kernel runtime for resource limited ADAS hardware, reducing computational and memory overhead
- Enhanced detection accuracy for skewed datasets using different sampling techniques
- Authored code documentation in Doxygen and research transcript in LaTeX to ensure maintainability

Internship – *Vision-Based Pedestrian Detection at Night* Nov 2014 – Apr 2015, Germany

- Implemented an advanced fast multi-exposure HOG feature descriptor (a state-of-the-art algo for extracting image features for object detection task) using C/C++ for detecting pedestrians at night scenario
- Implemented data augmentation techniques, such as brightness adjustment, contrast enhancement, noise addition, tone variation etc.
- Evaluated models with metrics like Precision/Recall, Average Precision, FPPI/MissRate, F1-score to ensure performance reliability

EDUCATION

Technische Universität Chemnitz Mar 2013 – Sep 2015, Germany
MSc in Automotive Software Engineering

Visvesvaraya Technological University Mar 2007 – Sep 2011, India
BE in Electronics & Communication Engineering