



# GAURANG SHARMA

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📄 [M.Sc. Thesis](#)

Connecting the world of probabilities to the world of possibilities by leveraging emerging technologies to drive business outcomes.

## SUMMARY

- **4 years** of overall work experience in software development and machine learning.
- Improved ML models for joint ventures with **Valmet, AGCO Power, and Futudent** including pilot projects, resulting in up to 20% accuracy boost over prior versions.
- **Consultancy experience** with banking, health & care, manufacturing, and pharmaceutical clients.
- Worked in an **agile** environment, collaborating with **cross-functional teams** to deliver high-quality software solutions.
- Proficient in machine learning libraries including Detectron2, Yolo, TensorFlow, PyTorch, and NumPy.
- **Master's degree with distinction** in Computing Science with a specialization in Signal Processing and Machine Learning.
- Adept at communicating intricate findings to both technical as well as non-technical stakeholders.

## WORK EXPERIENCE

### Machine Learning Researcher

Tampere University

June 2022 - Present

Tampere, Finland

- Experience with computer vision, robot perception, and visual language models.
- Worked with **manufacturing, inspection, and anomaly detection** industrial projects.
- Conducted research on object detection, segmentation, keypoint estimation, 6D pose, and multitask learning models.
- Data generation, processing, labeling, and augmentation exposure for **developing generic pipelines**.
- Synthetic data generation with 3D CAD models, domain adaption and randomization knowledge.
- Exposure to multi-label data formats for **deep multitask learning**.
- Experienced in writing scientific papers, journals, and texts to present research work.
- **Advised** a startup on potential AI/ML applications.
- Thesis on object detection and sim-to-real 6D pose estimation.

### Programmer Analyst, Software Engineer

Cognizant technology solutions

September 2018 - July 2021

Chennai, India

- Consultancy experience with banking and pharmaceutical clients.
- Developed, maintained, and migrated **DevOps** applications using modern front-end technologies.
- Exposure to **CI/CD pipelines**.
- Proficient in cross-browser and cross-device compatibility, with an emphasis on responsiveness, accessibility, and interactive web development.
- Experienced in creating configurable layouts and functionalities for **dynamic and global components**.
- Worked on an onshore-offshore model with **direct client interaction**.
- Consulted businesses and developed solutions using **agile** methodologies.
- Integrated Python backend with AJAX calls and JSON structures.

## SKILLS

Python ● ● ● ● ●  
MATLAB ● ● ●  
Blender Proc ● ● ● ●  
NumPy ● ● ● ● ●

Detectron2 ● ● ● ● ●  
jQuery/JavaScript ● ● ● ● ●  
TensorFlow and Keras ● ● ● ● ●  
Responsive Web Design ● ● ● ● ●

Detection ● ● ● ● ●  
JSON ● ● ● ● ●  
PyTorch ● ● ● ●  
HTML5 & CSS3 ● ● ● ● ●

## EDUCATION

### Master of Science (Technology), Computing Sciences

Tampere University

Overall GPA: 4.85/5

Specialization in **Signal Processing and Machine Learning**: Grade 5/5

Thesis on Object detection and sim-to-real 6D pose estimation: Grade 5/5

2021 - 2023

*Tampere, Finland*

### Bachelor of Technology, Computer Science and Engineering

Dr. A.P.J. Abdul Kalam University, Bachelor of Technology

Overall Percentage: 74.2%

Thesis on Image categorization

2014 - 2018

*Meerut, India*

## PROJECTS

### Research on human-robot collaboration using visual language models

Flamingo, Transformers, CNNs, Image captioning, VQA

(In progress): Research on **visual language models** to perform **human-robot collaboration**. The project deals with perception, image-to-text, and text-to-speech frameworks. Includes **multi-modality** concepts having visual and language modalities.

### AGCO Power Diesel Engine assembly

Object, pose, and depth estimation

To improve the efficiency of the diesel engine assembly, an object and target detection system was developed. The system was trained on a dataset that had been manually labeled and augmented to include eight classes. **Multitask learning** was utilized to perform **object detection, instance segmentation, and keypoint estimation**, resulting in a more accurate and efficient system. The dataset has been published and is publicly available on Zenodo.

### Inspection of Valmet paper suction rolls

Roll inspection and blockage detection

Developed and implemented a robot **inspection** system to efficiently detect blockages in the 0.5-mm suction holes of large paper suction rolls, utilizing a combination of artificial and manually annotated datasets, thus saving valuable time and effort for human operators.

### Multi-label Annotation for Visual Multi-Task Learning Models

Data generation pipeline, pose configuration, instance segmentation, and detection

The project involved the creation of a novel pipeline for simultaneous annotation and augmentation of bounding boxes, polygons, and keypoints. The pipeline utilized Label Studio for annotation and the **albumentations** library for augmentation.

### Dental disease detection

Dentistry application

Successfully conducted a **pilot** project in the field of dentistry, showcasing the optimal use of available datasets. Additionally, provided Futudent with **consultation** services to explore potential AI applications in their business domain.

### Metrics/ADAPT competition on assembly parts detection

Sim-to-real small assembly part detection

The project involved generating **synthetic data** in **BOP** format using **blenderProc**, which was used to train Mask RCNN for object detection and segmentation in real-world environments. The resulting model demonstrated superior performance and accuracy, enabling the **identification and segmentation** of objects in real-world scenarios with greater precision.

## ACHIEVEMENTS

- Felicitated with the Graduation Award by the Industrial Research Fund at Tampere University.
- Awarded 100% merit-based tuition fees scholarship worth 24000 €.
- Winner of ICRA 2023: METRICS ADAPT Human-Robot Collaborative Assembly Challenge.