Gaurang Sharma

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The following information describes a person who connects the world of probabilities to the world of possibilities.

Summary

- Overall, almost 4 years of work experience in software development and computer vision.
- Improved ML models for joint ventures with Valmet, ACGO Power, and Futudent, resulting in up to 20% accuracy boost over prior versions, including pilot projects.
- Utilized object detection and data augmentation techniques to optimize model performance and reduce false positives.
- Worked in an agile business environment, collaborating with cross-functional teams to deliver high-quality software solutions.
- Proficient in machine learning libraries including Detectron2, Yolo, TensorFlow, and PyTorch, and continuously learning and exploring new technologies to advance in my career.

Professional Experience

Tampere University

Research Assistant, Robot Perception and computer vision (June 2022 and ongoing)

- Conducted research on various computer vision tasks, including object detection, segmentation, keypoint estimation, 6D pose, and multitask learning models.
- Generated synthetic datasets using 3D CAD models and BlenderProc. Also developed a data generation pipeline for multitask learning models spanning from annotations to augmentation of bounding boxes, key points, and polygons.
- Experienced in writing scientific papers, journals, and texts to present research work.
- Implemented object detection algorithms using Detectron2, YOLOv(3-7), and other detectors.
- Advised a startup on potential uses of artificial intelligence.
- Thesis on object detection and sim-to-real 6D pose estimation.

Cognizant technology solutions

Programmer Analyst, Software Engineer (September 2018 to July 2021)

- Developed, maintained, and migrated DevOps applications using modern front-end technologies.
- Proficient in cross-browser and cross-device compatibility, with 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 an agile methodology.
- Integrated Python backend with AJAX calls and JSON structures.

Skills

- Python
- MATLAB
- NumPy
- Blender Proc
- Detectron2
- jQuery/JavaScript
- TensorFlow and Keras
- Responsive Web Design
- YOLOv5
- JSON
- CSS 3
- HTML 5

Education

Tampere University, Master of Science (Technology)

Signal Processing, and Machine Learning in the Computing Sciences (August 2021 and ongoing)

Awarded 100% merit-based tuition fees scholarship worth 24000 €.

Grade: 4.77/5

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

Computer Science and Engineering. (August 2014 to June 2018)

Overall Percentage: 74.2%

Projects

ACGO Power Diesel Engine assembly

Object and target detection https://opendr.eu/deep-learning-for-robotics-in-agile-production/

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 (https://zenodo.org/record/7669593#.ZDKZWtJBxH6)

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. The conference research paper detailing this pipeline is sent for publication in MVA 2023.

Dental disease detection

Dentistry application

Successfully conducted a pilot project in the field of dentistry, showcasing the optimal use of available datasets. Additionally, Futudent received 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.

Voluntarily

Ahimsa Quest for Peace and Change

Worked as a team member and later headed a group of 30 individuals for three years, conducting various community service activities to benefit and educate society.