

Sanket Kalwar

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🌐 sanketkalwar

🌐 <https://sanketkalwar.github.io/>



Employment History

2020 – 2022

📌 Sr. Computer Vision Engineer, Wobot.ai

At Wobot, I was responsible for designing deep learning models based on computer vision use cases, creating documents for dataset requirements with the help of the data science team, benchmarking model performance and designing and executing the QA process for deployment and training, and also managing the team for doing the same.

Achievements/Tasks:

- **Localised Activity Recognition model:** The Task was to localise and recognise the activity of the people in the video to monitor their safety.
- **Key-points Based Activity Recognition and Localisation model:** The Task was to localise and recognise the activity of the people in the video using skeletal points.
- **Change Detection model:** The Task was to detect whether the passage-way is clear or not.
- **Computer vision dataset management system:** The Task was to create a CLI-based tool for the dataset management system.

2019 – 2020

📌 Lead Deep Learning, Jekson Vision

My responsibility was to decide which deep learning model could solve the computer vision problem effectively and to design training and deployment strategy.

Achievements/Tasks:

- **Label Inspection System:** The Task was to develop a deep learning model to detect defects in the label image given the template image.
- **Blister Inspection System:** The Task was to detect capsules and blisters using object detection API.

2018 – 2019

📌 Sr. Machine Vision Engineer, Yantra Harvest

Achievements/Tasks:

- **Object Detection API:** Creating object detection API for industrial inspection use case. This project was completed by taking help of Ross Girshick Faster-RCNN paper for object detection.
- **Mahindra Crankcase Inspection:** Task was to create an automated crankcase inspection system for classifying whether crankcase faces are defective.
- **Anomaly Detection:** Task was to generate a segmentation map of the anomalous portion in the image using supervised learning on DAGM2007 dataset. (*This project was completed with results slightly better than NVIDIA's whitepaper implementation of the same problem with DAGM2007 dataset.*)

Education

2022 – present*

📖 **M.Sc. Computer Science, IIIT Hyderabad.**


Thesis title: *Scene Understanding in Adverse Weather Conditions.*

Advised By: **Prof. K Madhava Krishna.**

External Adviser: **Dr. Sourav Garg** from (*The University of Adelaide, Australia*) and **Prof. Srinath Sridhar** from (*Brown University, USA*).

Research Publications

Conference Proceedings

- 1 **S. Kalwar***, D. Patel*, A. Aanegola, K. R. Konda, S. Garg, and K. M. Krishna, “Gdip: Gated differentiable image processing for object detection in adverse conditions,” in *2023 IEEE International Conference on Robotics and Automation (ICRA) [A* Conference]*, 2023, pp. 7083–7089.  DOI: 10.1109/ICRA48891.2023.10160356.

ArXiv Proceedings

- 1 **S. Kalwar***, M. Ungarala*, S. Jain*, *et al.*, *Diffprompter: Differentiable implicit visual prompts for semantic-segmentation in adverse conditions*, 2024. arXiv: 2310.04181 [Under Review IROS 2024].
- 2 G. Singh*, **S. Kalwar***, M. F. Karim, *et al.*, *Constrained 6-dof grasp generation on complex shapes for improved dual-arm manipulation*, 2024. arXiv: arxiv [Under Review IROS 2024].
- 3 **S. Kalwar***, A. Aich, and T. Dixit, *Latentgan autoencoder: Learning disentangled latent distribution*, 2022. arXiv: 2204.02010 [cs.CV].

Skills

Languages	📖 Strong reading, writing and speaking competencies for English, Hindi and Marathi.
Field of Focus	📖 Computer Vision, Robotics (3D Perception), Deep Learning and Representation Learning.
Coding Languages	📖 Python, C, C++, \LaTeX
Frameworks & Tools	📖 PyTorch, TensorFlow, SciPy, Open3D, Nvidia Isaac Gym.
Misc.	📖 Academic research, teaching, training, consultation, \LaTeX typesetting and publishing, efficient vectorization of code, understanding of probabilistic graphical model, proficient in deep-learning.

Some Fun free-time Implementation

Language Model 📖 **LSTM: A Search Space Odyssey (Paper Implementation)**

- As a pet Project, I had implemented language model(LSTM) using numpy from scratch with different variants like(bidirectional LSTM, peep-hole connections, without peephole connection) which was inspired by Andrej Karpathy (The Unreasonable Effectiveness of Recurrent Neural Networks) blog and referred(<https://arxiv.org/abs/1503.04069>).
- Link For the Project: <https://github.com/sanketkalwar/LSTM>