Shubham Gupta

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Machine Learning Engineer: Second year graduate student studying Computer Engineering at New York University and Climate Modelling Research Assistant. Extracurricular Computer Vision and DevOps lead. Three internships with experience in working with PyTorch, TensorRT, Python, Docker, Git and GitHub Actions.

Experience

NYU RoboMaster: Ultraviolet — New York City, US
Computer Vision & DevOps Lead - Mentor: Chris DiMauro — *September 2022 – Present*

- Lead SDK and Machine Learning developer at Ultraviolet, a DJI robotics eSports team.
- Spearheaded research and development of quantization of object detection models, YOLOv5, YOLOv8, and YOLO-NAS.
- Write high-performance Python and C++ CPU and GPU machine learning inference docker containers which is compiled for X86 and ARM, for Linux, MacOS, Windows, used for tracking enemy robots at RoboMaster University League (RMUL).
- Built detection and tracking solution using YOLOv5, DeepSORT, and TensorRT which was used by Ultraviolet to achieve $5th$ position in RMUL 2023 against twenty teams worldwide.
- Create product vision and roadmap, delegate and teach core concepts, build out CI/CD automations on GitLab.

Aruba, a Hewlett Packard Enterprise company — Bangalore, India
Software Development Intern - Manager: Sachin Sanap — *January 2022 – July 2022*

- Developed SpringBoot APIs using ElasticSearch and Postgres data for IoT Operations, edge to cloud story.
- Designed and deployed tool using ElasticSearch, Grafana and Python to monitor IoT Operations customer statistics.

Indian Space Research Organization — Bangalore, India
Research Intern — Advisor: Dr. Hebbar R — *August 2019 – April 2020*

- **Published work** at the international conference of Computer Vision and Machine Intelligence (CVMI 2022).
- Demonstrated an automated Sentinel-2 data pipeline with **SnaPy** and **GDAL** for water body detection, **eliminating** manual annotation. Tested on DeeplabV3+ and a custom architecture for near real time water segmentation.

Education

New York University — New York City, US
Master of Science in Computer Engineering — 3.78/4.00 — *May 2024*

PES University — Bangalore, India
Bachelor of Technology in Computer Science and Engineering — 8.39/10.0 — *May 2022*

Publications

Lee, K., **Gupta, S.**, Kim, S., Makwana, B., Chen, C., & Feng, C. (2023). SO-NeRF: Active View Planning for NeRF using Surrogate Objectives. arXiv preprint arXiv:2312.03266. **[preprint]** **[code]**

Gupta, S., Uma, D., Hebbar, R. (2023). Analysis and Application of Multispectral Data for Water Segmentation Using Machine Learning. In: Tistarelli, M., Dubey, S.R., Singh, S.K., Jiang, X. (eds) Computer Vision and Machine Intelligence. Lecture Notes in Networks and Systems, vol 586. Springer, Singapore. https://doi.org/10.1007/978-981-19-7867-8_56 **[preprint]** **[code]** **[publication]** **[slides]**

Gupta, S., Ravishankar, R. K., Gangaraju, M., Dwarkanath, P., & Subramanyam, N. (2022). WSSL: Weighted Self-supervised Learning Framework For Image-inpainting. arXiv preprint arXiv:2211.13856. **[preprint]** **[code]** **[publication]** **[poster]**

Projects

Cavemen: A prehistoric approach for Mapless Navigation | **[Website]** | *Python3, Github, FAISS, Redis* — 2023

- Visual Place Recognition using Visual Bag of Words implemented by SIFT features and FAISS library. Path Planning using Dead Reckoning and A* algorithm.

Leave Your Clothes Behind | **[Website]** | *Python3, HPC, PyTorch, Blender, Pytorch3D* — 2023

- We present a pipeline thay uses **SAM** to extract the clothes from a monocular handheld video and **COLMAP** to generate camera parameters. We then feed it to **NeRF2Mesh** to create an exportable mesh. .

Technical Skills

Languages: Python3, C++, Java, SQL, Javascript, Shell, Lucene, LaTeX
Libraries: PyTorch, Pytorch3D, Onnx, TensorRT, OpenCV, Scikit-learn, Numpy, Pandas, Numba, PyRealSense2, Flask, FFmpeg
Frameworks: ROS2, SpringBoot, Flutter, Hadoop, Elasticsearch, Jekyll, Hugo, Jenkins, Kubernetes, CUDA
Applications: HPC, AWS, GCP, Docker, Grafana, QGIS, Github, Jira, Confluence, Firebase Postman, Adobe Lightroom, Blender
Certifications: Associate Cloud Engineer, Architecting with Google Compute Engine, 30 Days of Google Cloud