Shubham Gupta

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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