Shubham Gupta

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EDUCATION

New York University   New York City, US

Master of Science in Computer Engineering — GPA: 3.67/4.0   *May 2024*

- Working under the supervision of **Dr. Chen Feng** at **AI4CE** .

PES University   Bangalore, India

Bachelor of Technology in Computer Science and Engineering — GPA: 8.39/10.0   *May 2022*

- Thesis project advised by **Dr. Natarajan S** .

PUBLICATIONS

- **"Analysis and application of multispectral data for water segmentation using machine learning." (CVMI 2022).** Analyzed the performance of eight machine learning classification algorithms on multispectral data provided by Sentinel-2. Empirically demonstrated Short wave infrared bands are best suited for water body segmentation. **[preprint] [code] [publication]**

- **"WSSL: Weighted Self-Supervised Learning Framework for Image-Inpainting." (CGVCVIP 2022).** Demonstrated a novel technique for image inpainting with using self supervised learning achieving competitive results with supervised learning models. The technique uses a combination of weighted pretraining tasks and the downstream loss function uses a weighted sum of reconstruction loss and perceptual loss leading to superior results. **[preprint] [code] [publication]**

TECHNICAL SKILLS

Languages: Python3, C++, Java
Databases: MySQL, Firebase
Frameworks: SpringBoot, Flutter, Hadoop
Libraries: PyTorch, OpenCV, Scikit-learn
Applications: HPC, AWS, GCP, Docker, QGIS, Github

EXPERIENCE

NYU Courant Institute   February 2023 – Present

*Climate Modeling Research Assistant — Advisor: **Dr. Laure Zanna***   *New York City, USA*

- Updated and restructured Machine Learning content in **L96_demo** to make concepts more beginner friendly.
- Maintaining and updating user experience for the **m2lines** website.

NYU Marron Institute   January 2023 – Present

*Urban Transit Research Assistant — Advisor: **Dr. Elif Ensari***   *New York City, USA*

- Experimented with **Open Vocabulary Semantic Segmentation** models: **X-Decoder** and **Grounded-SAM**, and **ViT-Adapter** to self annotate man-made boundaries from Google Street View data.

NYU Robomaster   September 2022 – Present

*Computer Vision Lead - Mentor: **Chris DiMauro***   *New York City, USA*

- Contributed to finishing 5th in the RoboMasters University League 2023.
- Reduced inference latency by **40%** on **YOLOv5** using **TensorRT** deployed on **Jetson (aarch64)** and **x86** devices using **Docker** NGC containers.

Aruba, a Hewlett Packard Enterprise company   January 2022 – July 2022

*Software Development Intern - Manager: **Sachin Sanap***   *Bangalore, India*

- Constructed **SQL** queries and **SpringBoot APIs** to be used for visualizations for customers in production. The APIs provided insights on customer devices and apps usage patterns.
- Usage Dashboard: an internal tool allowing developers to gain insights on the resources used by customers using **Grafana**, **SQL**, **Elasticsearch** and **Python3**.

CBeyond Technologies LLP   November 2021 – June 2022
Founder and CTO   *Bangalore, India*
- A company to make Computer Vision based SaaS solutions available to the general public.
- FacePass: We aim to provide a face authentication system as an alternative to fingerprint system. Our solution will focus on reducing contact surfaces for a more seamless authentication service.

Center for Cloud Computing and Big Data, PES University   June 2020 – July 2020
Project Intern — Advisor: **Dr. K V Subramaniam**   *Bangalore, India*
- Lead a project to track blood glucose levels in type-2 diabetic patients.
- Developed an Android app using **Java**, **Fit Android API**, and **Fit REST API** for monitoring and uploading real time health statistics.
- Provided insights of steps per day, caloric burned and intake using **Google Cloud Platform** and **Firebase**.

Regional Remote Sensing Center - South, ISRO   August 2019 – April 2020
Research Intern — Advisor: **Dr. Hebbar R**   *Bangalore, India*
- **Published work** at the international conference of Computer Vision and Machine Intelligence (CVMI 2022).
- Developed a Sentinel-2 multispectral data pipeline using **SnaPy** and **GDAL** that was fully automated requiring **zero human annotation** for water bodies.
- Demonstrated DeeplabV3+ can achieve **0.92 mIoU** on Bengaluru lakes using transfer learning weights of PASCALVOC2012 dataset.

Center for Data Science and Applied Machine Learning, PES University June 2019 – August 2019
Research Intern — Advisor: **Dr. Uma D**   *Bangalore, India*
- Developed a model to monitor open water bodies from aerial drone images using **DeepLabv3+**.
- Won 1st place in one of the three internal hackathons and won 'L2' position for the final project demonstration.
- Recommended to work with scientists at RRSC-S, ISRO.

Projects

Compressed Sensing | *Python3, Numpy, Github, JupyterBook*   2023
- Implement Compressed Sensing on MRI data using **primal dual splitting algorithm** using random and equidistant masks.

Leave Your Clothes Behind | *Python3, HPC, PyTorch, Blender*   2023
- Extract clothes from monocular RGB videos using **SAM** to be used as 3D assets generated by **NeRF2Mesh** .

Honors and Awards

- Award merit based scholarship at New York University (2022).

- Recipient of the Distinction Award Certificate(SGPA of 7.75 or higher) in Semesters I, II, IV, V, VI, VII, and VIII at PES University.

- Recipient of the MRD scholarship(top 20% of the department) in Semesters V and VI at PES University.

- Member of winning team Collective at the MIT Covid19 Challenge India:Track I (2020).

Licenses and Certification

- Associate Cloud Engineer by Google Cloud (2021).

- Architecting with Google Compute Engine by Google Cloud - Coursera (2021).

- 30 Days of Google Cloud by Google Cloud (2020).