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]** **[slides]**
- **"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]** **[poster]**

Technical Skills

Languages: Python3, C++, Java
Databases: MySQL, Firebase, Lucene
Frameworks: SpringBoot, Flutter, Hadoop, Jekyll, Hugo
Libraries: PyTorch, OpenCV, Scikit-learn, Numpy, Pytorch3D
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 **M^{2}Lines** website.

NYU Marron Institute — January 2023 – August 2023
*Urban Transit Research Assistant — Advisor: **Dr. Elif Ensari*** — *New York City, USA*
- Achieved an accuracy of **85%** in classifying boundaries from Google Street View data for the **IBX project**.
- Experimented with **Open Vocabulary Semantic Segmentation** models: **X-Decoder** and **Grounded-SAM**, and **ViT-Adapter** to self annotate man-made boundaries from data.

NYU Robomaster — September 2022 – Present
*Computer Vision Lead - Mentor: **Chris DiMauro*** — *New York City, USA*
- Contributed to securing 5^{th} in the RoboMasters University League 2023 against eighteen teams across the world.
- Reduced inference latency by **40%** on **YOLOv5** using **TensorRT** deployed on **Jetson (aarch64)** and **x86** architecture 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*

- **Founded** 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 having **zero contact points** to comply with covid restrictions.

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 1^{st} 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

- 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).