Shubham Gupta

Email | LinkedIn | Github | Instagram

Education

New York University — New York City, US
Master of Science in Computer Engineering — *2022 - 2024*

- GPA: 3.778/4.0
- Urban Transit Research Assistant at the NYU Marron Institute of Urban Management.
- Climate Modeling Research Assistant at the NYU Courant Institute of Mathematical Sciences.
- Working under the Computer Vision subteam for the Robomaster Vertically Integrated Project.

PES University — Bangalore, India
Bachelor of Technology in Computer Science and Engineering — *2018 - 2022*

- GPA: 8.39/10.0
- Recipient of the Distinction Award Certificate(SGPA of 7.75 or higher) in Semesters I, II, IV, V, VI, VII, and VIII.
- Recipient of the MRD scholarship(top 20% of the department) in Semesters V and VI.
- Teaching Assitant for the core course UE19CS352 - cloud computing.
- Finsihed 3^{rd} place in the Prakalpa Science Competition 19' for our work on Chladni Patterns.

Delhi Public School — Hyderabad, India
Central Board of Secondary Education, Science — *2016 - 2018*

- Percentage: 94.6
- Scored 99/100 in Informatic Practices, highest in the batch.
- Scored 97/100 in Chemistry, highest in the batch.

Ryan International School — Bangalore, India
Indian Certificate of Secondary Education, Science — *2010 - 2016*

- Percentage: 92.0
- Scored 100/100 in Computer Science, highest in the batch.

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]**
- **"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]**

Experience

Climate Modeling Research Assistant — February 2022 – Present
NYU Courant Institute — *New York City, USA*

- Optimizing code and fixing bugs on the **L96_demo** repository.
- Maintaining and updating the **m2lines** website.

Urban Transit Research Assistant — January 2022 – Present
NYU Marron Institute — *New York City, USA*

- Building a pipeline to automate building boundary classification using Google street view images for the IBX project study.
- Annotated **5000** data points for one of the station neighborhoods of the IBX Project.

Computer Vision & Embedded September 2022 – Present

NYU Robomaster *New York City, USA*

- Building the CI/CD pipeline for Computer Vision repository.
- Contributing to the detection and plate tracking algorithm.
- Working on code containerization and optimization using Tensor-rt.

Software Development Intern January 2022 – July 2022

Aruba, a Hewlett Packard Enterprise company *Bangalore, India*

- Worked with the IoT Operations team in Bengaluru under Sachin Sanap.
- Usage Dashboard: an internal tool allowing developers to gain insights on the resources used by customers using Grafana, SQL and Elasticsearch.
- Upgraded Debug Dashboard by providing a cleaner interface and more APIs.
- Upgraded Docker images and modules to reduce security vulnerabilities.

Teaching Assistant January 2022 – June 2022

PES University *Bangalore, India*

- TA for the course UE19CS352 Cloud Computing under the guidance of Professor Venkatesh Prasad.
- Responsible for creating and presenting slide decks and lab experiments.
- Developed Problem statement 3 for lab Hackathon.

Founder and CTO November 2021 – Present

CBeyond Technologies LLP *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.

Project Intern June 2020 – July 2020

Center for Cloud Computing and Big Data, PES University *Bangalore, India*

- Worked under Dr. K V Subramaniam.
- Developed an android app for monitoring and uploading health statistics of diabetic patients.
- Provided insights of steps per day, caloric burned and intake using Google Cloud Platform.
- Synced patient data on the cloud using realtime Firebase.

Research Intern July 2019 – April 2020

Regional Remote Sensing Center - South *Bangalore, India*

- Worked under Dr. Ramachandra Hebbar.
- Implemented land and water spectral indices to monitor land cover of Bangalore, India.
- Demonstrated a novel technique to annotate multi-spectral data and train neural networks.

Research Intern June 2019 – July 2019

Center for Data Science and Applied Machine Learning, PES University *Bangalore, India*

- Worked under Dr. Uma D.
- Developed a model to monitor open water bodies from aerial drone images.
- Won 1^{st} place in one of the three internal hackathons conducted.
- Won 'L2' position for the final project demonstration.

Projects

Playing with Actions | *Github, Github Actions, shell* 2023

- A side project to learn and understand automation tasks possible using Github Actions. Implemented two workflows.
- First workflow demonstrates how to automatically create a release package on merging sprint branches with the main branch.
- Second workflow demonstrates how to automatically create the next numerical sprint branch when the current sprint branch is merged with main. Sprint naming convention can be manipulated using scripting.

WSSL | *Python3, Tensorflow, Scikit-learn* 2022

- Undergraduate Thesis project at PESU done under Dr. S.Natarajan.
- Work demonstrates image reconstruction using a novel technique: Weighted Self Supervised Learning.

STAAC | *C++ STL, Python3* 2021

- An End Semester Project under the Generic Programming elective.
- Implemented a key-value data structure (splay tree) as a container which is compatible with C++ STL library.
- Compared the performance of Splay Tree to the inbuilt Map container for insertions and deletions.
- Compared the caching performance of Splay Tree to Map container and LRU-cache data structure.

FFT-Noise | *C, WebGL, Python3* 2021

- An Open Source project exploring procedural generation and noise algorithms.
- The project demonstrates noise generation is possible using Fast Fourier Transforms.
- Contributed to the 2D-Fast Fourier Transform function.
- Contributed to the testing scripts to compare with other noise functions

Iterators in C | *C* 2021

- An End Semester Project under the Design Patterns elective.
- Implemented a common Iterator object for three data structures: Arrays, Linked Lists and Binary Search Trees.
- The project demonstrates different types of Iterators available in C++, namely: Bidirectional Iterator and Random Access Iterator.
- The project makes use of Iterator and Strategy design patterns and Virtual tables to mimic classes from C++.

Javascript Mini-Compiler | *Lex, Yacc, C, Python3* 2021

- An End Semester Project for the Compiler Design course.
- The project implements the frontend of a compiler. The phases include: Tokenization, Abstract Syntax Tree Generation, Intermediate Code Generation and Code Optimization.
- The compiler has support to parse variable declaration and initialization, conditional statements, and looping statements.

Advanced Algorithms | *C* 2020

- A personal project implementing most algorithms learnt and the assignments submitted during the Advanced Algorithms elective.
- The project demonstrates concepts of Amortized Complexity, String matching algorithms, Number Theory and Dynamic Programming.

Technical Skills

Languages: C, C++, Python3, Java. Dart, Javascript
Databases: MySQL, Firebase
Frameworks: SpringBoot, Flutter, Hadoop
Libraries: Tensorflow, PyTorch, OpenCV, Scikit-learn, JDBC
Applications: AWS, GCP, SNAP, QGIS, Adobe Lightroom

Licenses and Certification

Associate Cloud Engineer December 2021
Google Cloud

Architecting with Google Compute Engine May 2021
Google Cloud - Coursera

30 Days of Google Cloud December 2020
Google Cloud

Community

Member August 2019 – June 2022

PIXELS Photography Club/PES University *Bangalore, India*

- Photographer at The Hult Prize 19'.
- Photographer at Unity Workshop 20'.
- Photographer at OpenMic 20'.
- Photographer at CODS x IEEE-VIT 20'.
- Photographer and Videographer at Ninaada 20'.

Project Contributor January 2021

Crio.do *Bangalore, India*

- Converted one of my personal projects into a step-by-step guide for everyone to recreate.
- The project INTAL, addresses the shortage of a library in the C language that can handle BigIntegers like Java and C++.
- By the end of the project, developers will have an understanding of dynamic memory allocation, arithmetic manipulations of character arrays, and applications of BigIntegers.

Star Dev Creator October 2020

Crio.do *Bangalore, India*

- Recognition for my contributions towards Crio.Do's #IBelieveInDoing program.
- My contribution was officially recorded as part of my the HacktoberFest 2020 submissions.

Head of Android Development August 2020 – May 2021

Google Developer Student Clubs/PES University *Bangalore, India*

- Conducted the Android Study Jams 2021 for nearly 400 participants.
- Delivered three virtual sessions covering topics for the Associate Android Developer exam.
- Recognized as Campus Facilitator for conducting Android Study Jams 2021.

Community Service August 2018

Bootstrap/PES University *Bangalore, India*

- Prepped and painted walls of a Government school near the outskirts of Bangalore, India.

Hackathons

- Member of winning team Collective at the MIT Covid19 Challenge India:Track I.
- Participated as Team while(true); at the Aadhaar Hackathon 2021.
- Participated at the Galileo Hackathon 19'.
- Participated as Team DrivEZ at the HashCode 18'. Qualified as the top 40 teams.