Pratulya Bubna

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EDUCATION

University of Southern California (USC) — Los Angeles, CA
M.S. in Computer Science **GPA:** 3.86/4.0 — Aug 2019—Dec 2021
Relevant Coursework: Algorithms, Artificial Intelligence, NLP, Operating Systems, Data Mining

Guru Gobind Singh Indraprastha University (GGSIPU) — New Delhi, India
B.Tech. in Information Technology (81.51%, First Class with Distinction) — Aug 2014—May 2018

SKILLS

Programming Languages (proficient): Python, C, C++ (familiar): Javascript, jQuery, Bash, HTML, CSS
Libraries and Frameworks PyTorch, Keras, NumPy, Scikit-learn, OpenCV, Django, PySpark, pthread (multithreading), Flask
Other Unix, Linux, MySQL, Jupyter, Knowledge Graphs, Docker, MapReduce, Makefile, Redis

EXPERIENCE

Mercedes-Benz Research & Development — Bangalore, India
Research Intern (Intelligent Interiors, Cars) — Jun 2020—Dec 2020

- Researched in "Deep Learning for 3D Point Clouds", working on 3D tasks — part segmentation, surface normal estimation, mesh reconstruction, 3D object classification — experimenting primarily with graph neural networks (GCNs) based architectures **[Blog]**
- Worked briefly on generating synthetic data for 2D human pose estimation using Blender software (scripting) and humanoids
- Utilized: PyTorch, PyTorch Geometric, PyTorch Lightning, numpy, sklearn, Python, Docker, Jupyter, ipyvolume, open3d, trimesh

USC Information Sciences Institute — Los Angeles, CA
Research Assistant (Center on Knowledge Graphs, AI Division) — Oct 2019—May 2020

- Worked with ML and GIS tools to develop an unsupervised framework to extract geographical features (eg. railroads, wetlands) from scanned historical maps, linking them over time and space using knowledge graphs **[Website]**
- Trained UNet, PSPNet to segment the railroad features and used clustering analysis to denoise the vector data from masks **[Github]**
- Utilized: Python, PyTorch, Keras, numpy, geopandas, shapely, opencv, clustering analysis (density, agglomerative), PostgreSQL

Coding Blocks — New Delhi, India
Course Instructor, Mentor — Jun 2018—Jul 2019

- Trained **100+** students and working professionals on Machine Learning and Server-Side Programming with Python
- Notable Projects: Image Captioning, GANs, Flappy Bird, Text Generation with LSTMs, Style Transfer **[Github]**
- Utilized: Python, Keras, numpy, pandas, scikit-learn, Django, Django ORM (SQLite3), SQLAlchemy, requests, Javascript

PROJECTS

Personal Website: *https://pratulyab.github.io* (for additional information and projects)

Weenix Operating System — Feb 2021—May 2021
Coursework | Operating Systems (CSCI 402) **[Github]**

- Wrote a Unix-like OS that supports processes, threads, file system, virtual memory (paging) and runs on QEMU Intel x86 emulator
- Utilized: C, Linux (32-bit), QEMU, gdb, Makefile

Data Mining with Spark — May 2021—Jun 2021
Coursework | Foundations and Applications of Data Mining (DSCI 553) **[Github]**

- Implemented data mining algorithms on Yelp dataset using PySpark utilizing MapReduce paradigm
- Recommender Systems (collaborative filtering), Frequent Itemsets (SON algorithm), Graphs (BFR clustering, community detection)
- Utilized: Python, PySpark, Spark RDD (resilient distributed datasets)

Network Traffic Shaper using Token Bucket Filter — Jan 2021—Feb 2021
Coursework | Operating Systems (CSCI 402) **[Github]**

- Simulated a multithreaded traffic shaper controlled by a token bucket filter, handling SIGINT signal synchronously (using threads)
- Utilized: C, pthreads (POSIX multithreading), Linux (32-bit), Makefile

Placement Cell Web Portal — Aug 2016—Aug 2018
Personal | Self-Initiated | Leadership **[Website]**

- Built a centralized portal to digitize and streamline the placement activities of over **120+ colleges** affiliated to GGSIPU
- Led the team to port laborious clerical work to the semi-automated online system, facilitating interaction among **630+ students** and **30+ recruiters**, for the class of 2018
- Utilized: Python, Django, Javascript, jQuery, AJAX, Redis (message broker, caching), Celery (distributed task queue), Linux, Bash, VPS (DigitalOcean), cron, HTML, CSS, MaterializeCSS