Pratham Shah

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Education

Veermata Jijabai Technological Institute	**Jan 2021 – Jun 2024**
*B.Tech in Information Technology — CGPA: 8.71/10	Rank: 11/89*	*Mumbai, India*

Prakash College of Commerce & Science	**Jun 2018 – May 2020**
*Higher Secondary Education: 85.38%	MHT-CET: 99.86%ile*	*Mumbai, India*

Relevant Coursework

- Linear Algebra
- Artificial Intelligence
- Machine Learning
- Parallel Computing
- Data Structures & Algorithms
- Data Interpretation & Analysis
- Database Management System
- Digital Image Processing

Experience

CodeSwitch TextGeneration ⬈ — Jul 2023 – Present
Research Intern at Speechlab, NTU Singapore — Dr. Chng Eng Siong ✦ — *Remote*

- Developing a pipeline to facilitate **code-switch** (English-Malay) text generation for NER task through PaLM API.
- Leveraged the **Self-Bleu** metric for prompt quality assessment and applied the **multi-lingual BERTScore** to identify high-quality code-switch candidates.
- Replicating the approach for **low-resource languages**, demonstrating adeptness in cross-lingual NLP strategies.

SAP Labs India ⬈ — Jun 2023 – Aug 2023
Software Developer Intern — Mr. Ramu Gowda & Mr. Suman De ✦ — *Banglore, India*

- Migrated code from SAP UI5 to **React framework** of OneSAP Portal, an application designed to enable **customer success solutions.**
- Integrated components required for **ticket-raising** and **live attachments** functionality within the application.
- Structured **Core Data Services(CDS) models** and **OData serivce calls** to effectively manage entity operations within the SAP Cloud Application Programming Model(CAPire).

WordNet Linking ⬈ — Nov 2022 – Apr 2023
Research Intern at CFILT lab, IIT Bombay — Dr. Puspak Bhattacharya ✦ — *Mumbai, India*

- Researched an automated method for linking **multilingual Indo-WordNet** using synset embeddings.
- Incorporated **One-to-One** and **translation-based filtering** techniques to optimize candidate search space, achieving top-k similar synset retrieval efficiency in WordNets
- Submitted results in a long paper, **"Semi-automatic WordNet Linking using Synset Embeddings"** at **LREC-Coling 2024** (under review).

Google Summer of Code ⬈ — May 2022 – Sep 2022
Open-Source Developer at Forschungszentrum Jülich — Dr. Claudia Comito ✦ — *Remote*

- Custom method was devised to parallelize 1D and 2D **fully-distributed convolutions**. APIs for both implementations are **consistent** with other **mainstream libraries** and provide appropriate functionality.
- Performance was **improved** by adopting MPI **collective communication** (Bcast) instead of point-to-point non-blocking communication (Isend and Irecv) among the processes.
- **Documentations** and **correctness tests** on all edge cases were added for all the code produced.

Competitions

Spaitial AI– OpenCV Foundation ⬈ | *Stereo Vision, Deep learning, Pytorch* — Sep 2022 – Dec 2022
Secured Rank 3 globally ✦

- Developed a three-layer **pipeline in OAK-D Pro** to enhance depth estimation and disparity map generation.
- Applied MiDas for performing **Monocular depth estimation** on Single RGB image.
- Implemented a fusion method to generate a disparity map from monocular and stereo depth maps, resulting in a **refined depth map** with the benefits of both, achieving a real-time inference rate of **15 fps**.

Vision Beyond Limits– IIT Bombay, Techfest ☑ | *Deep learning, Tensorflow*   **Oct 2021 – Dec 2021**
Secured Rank 1 ✸

- Involved designing and coding a **multi-class classification** approach for disaster assessment of post-earthquake satellite imagery.
- Led the development of code to create **multi-label mask images** from the provided geojson file and further used it to train the **UNET** model and classified buildings according to their damage level.

Projects

Multi-Cam-ReID ☑ | *Object Tracking, Deep learning, Yolo-v4, Computer Vision*   **Jun 2022 – Aug 2022**

- Incorporating a **3-layer hierarchical model** for tracking people across non-overlapping camera output using person **re-identification** techniques.
- Implemented custom versions of **tracking algorithms** like Centroid, IoU, SORT, IoU predict, DeepSort.
- Devised own's **velocity model** which gives better results than the SORT on occlusions of multiple objects.

Image-Grouping ☑ | *Python, OpenCV, Scikit-Learn, Unsupervised learning*   **Sep 2021 – Oct 2021**

- Segregates images using **feature extraction** and **Clustering algorithm.**
- Used ORB algorithm to extract features from images and K-means to clusterize images on the basis of features.
- Made a **generalized K-means algorithm** from scratch and can select **best case clusters.**
- Added **Optimum K feature** using elbow method, to decides no. of clusters based on distortions of each cluster.

Technical Skills

Languages : Python, C/C++, JavaScript
Libraries : Heat, NumPy, Pandas, OpenCV, PyTorch, Scikit, TensorFlow
Developer Tools : Linux, Git, Github, CMake, Make, Anaconda
Miscellaneous : Computer Vision, Deep Neural Networks, MPI, Data Structures & Algorithms

Achievements & Co-curricular Activities

- Achieved **third rank globally** in the **Spatial AI International Competition**, 2022 hosted by OpenCV. ✸
- Winner of **Vision Beyond Limits, 2021** ✸ a deep learning competition at Techfest, IIT Bombay. ☑
- Selected at the **Amazon ML Summer School**, 2022 ✸ . Interacted with and learned from **Amazon scientists** who are experts in various Machine learning domains.
- Secured **rank 1** in SRA Autisim Challenge 2021. Designed an **autonomous bot** to navigate a guided path using an **RGB camera** and a **LIDAR sensor**.
- Achieved a **Top 5 position** in the **exploratory data analysis** datathon run by KJ Somaiya, Datazen 2021.
- Core member and lecturer at **Society of Robotics and Automation, VJTI** ☑, wherein I regularly conducted teaching sessions related to **Computer Vision, Machine Learning and Deep learning** for my juniors.