DEVASHISH PRASAD

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EDUCATION

Purdue University, West Lafayette, USA *Aug 2021 – May 2023*
Master of Science - Computer Science - Specialization in Machine Learning - GPA: 3.6/4.0

Pune Institute of Computer Technology, Pune, India *Aug 2018 – Jun 2021*
Bachelor of Engineering - Information Technology - CGPA: 9.6/10.0

WORK EXPERIENCE

Kihara Lab @ Purdue University, West Lafayette, USA | ***Research Assistant*** *Aug 2022 – Present*
- Building, optimizing & deploying deep learning models (like 3D CNNs) for protein structure prediction from cryo-EM maps (link).
- Researching and improving protein structure prediction using Graph NNs and conditional Latent Diffusion probabilistic modeling.

Snap Inc (Snapchat), Los Angeles, USA | ***Machine Learning Engineer Intern*** *May 2022 – Aug 2022*
- Researched and developed an Optical Flow-based model to get pseudo labels for all video key points tasks like face tracking.
- Applied self-ensemble techniques to reduce jitter in video labels; novel fine-tuning resulted in 2x accuracy and 15% faster labeling.
- Deployed the self-attention-based model in Snap's internal labeling tool (web app) using GCP, Kubernetes, and Tensorflow JS.

Viasat, West Lafayette, USA | ***Graduate Data Science Researcher*** *Aug 2021 – Apr 2022*
- Researched several seminal works in Blind Image Super Resolution; Benchmarked their performance for a consistent comparison.
- Added Vision Transformer (ViT) to CNN+Contrastive learning based (2021's best) model to further improve its accuracy (link).

Pirimid Fintech, Ahmedabad, India | ***Machine Learning Intern*** *Nov 2020 – Mar 2021*
- Improved the Early Warning System (link) for banks that predicts various risk signals for a loan account throughout its life cycle.
- Developed a BERT-based news sentiment analysis model to predict insolvency dates for companies with an accuracy of 60 days.

OrbitShifters, Minnesota, USA | ***R&D Machine Learning Intern*** *Jun 2020 – Aug 2020*
- Researched and developed a Video-based Sports Analysis engine (link) to detect various moves for the USA Olympics boxing team.
- Fine-tuned CNN-based Pose detection and GCN-based Action recognition models & developed novel player classification models.

AP Analytica, Pune, India | ***Deep Learning Intern*** *Oct 2019 – Jan 2020*
- Developed a state-of-the-art Image-based document (like invoices) parsing system and deployed it using flask based Heroku app.

Tribbianis Software Solutions, Pune, India | ***Machine Learning Intern*** *Jun 2019 – Aug 2019*
- Developed and deployed Face Recognition and online Face Registration system (link). Benchmarked VGG vs ResNet backbones.

RESEARCH PUBLICATIONS

CascadeTabNet: An approach for end-to-end table detection and structure recognition from image-based documents
[Oral] [100+ Citations] [1200+ stars] [350+ forks] [Github] [Paper] [arXiv]
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2020

HOG, LBP, and SVM-based Traffic Density Estimation at Intersection [Github] [Paper] [arXiv]
IEEE Pune Section International Conference (PuneCon), 2019

PROJECTS

Fine-grained image classification for wild trap camera *iWildcam 2021-FGVC8, Kaggle* [link]
- Developed a solution with 4x faster training pipelines for fine-grained classification of 200+ animal species across image bursts.
- Utilized various techniques to handle long-tailed class imbalance and achieved solo 7th/42 leaderboard place without an ensemble.

Video-based Real-time Human Authentication *Smart India Hackathon 2020, DRDO* [link]
- Built a unified system using multiple Face Tracking + Recognition + Anti-Spoofing, Gait recognition, & Pose Estimation models.
- Deployed as a web app using Django, SQLite, AJAX, and 3 cameras, with real-time user registration and anti-piggy backing.

Virtual Assistant *Bachelor's Degree Final Year Project, 2021, Pune* [link]
- Developed a voice-enabled virtual assistant; Fine-tuned a single model (JointBERT) for both Intent Classification and NER.
- Integrated NVIDIA's Flowtron (text2speech) + JointBERT (NLU) + SQLite database (knowledge) + CMU Sphinx (speech2text).

Weight pruning and Bayesian Neural Networks *Course Project - Probabilistic ML, Purdue MS CS* [link]
- Researched and reproduced a prominent Bayesian NN which can be pruned up to 90% weights and compared with SGD baselines.

Other Projects

1) SVM-based traffic estimation on Raspberry Pi; remote monitoring using PHP, REST API, HTML, CSS & JS-based web app [link].
2) Android, PHP, REST API & Mysql-based mobile app to track valuable goods using NFC tags, GPS location & historical reports [link].
3) HTML, CSS, JS, JSP & Mysql-based web app to record and analyze the college semester feedback of students for their teachers [link].
4) OS Kernel modifications for XINU OS with trapped system calls, O(1) scheduler, clock alarms, virtual memory, and paging support.
5) Fast API, BeautifulSoup, and Selenium-based web scrapping engine to retrieve various details for any company from public sites.

SKILLS

Languages: Python, Java, C++, C, Bash	**Deep Learning:** PyTorch, Tensorflow, Keras	**Data-Sci:** Scikit-learn, Numpy, Pandas
Frontend: HTML, CSS, JavaScript	**Backend:** JSP, PHP, FastAPI, Flask, Django	**Databases:** MySQL, Oracle, MongoDB
Big-Data: Apache Spark, PySpark, Hadoop	**MLOps:** GCP, AWS, Docker, Kubernetes, SLURM, Git	**Other:** TensorflowJS, OpenCV, Android

ACHIEVEMENTS

- **Finalist** Smart India Hackathon 2020, 2019, and 2018 (India's Biggest Hackathon).
- **Winner** of private Kaggle Competition, a data science competition for students hosted at IEEE Datawiz PICT 2019 (leaderboard).
- **Stackoverflow** 20+ answers with 1100+ reputation, and **DataScience.StackExchange** 30+ answers with an 800+ reputation.
- **Runner Up** Social Hackathon, at ACM PASCkathon PICT 2019 (Shortlisted to present at **Google DevFest 2019** Pune).
- **Winner** D. K. Bhave Scholarship, by Savitribai Phule Pune University.