

# 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 folding & structure prediction from density maps ([link](#)).
- Researching and improving protein structure prediction using Graph NNs and conditional Latent Diffusion generative 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 any video key points tracking tasks like face and body tracking.
- Applied self-ensemble techniques to reduce jitter in video labels; novel sparse optical flow fine-tuning reduced error by 2x & labeling time by 15%.
- Deployed the self-attention-based model in Snap's internal labeling tool (web app) using GCP, Kubernetes, Docker, Tensorflow JS & TypeScript.

**Viasat**, West Lafayette, USA | **Graduate Data Science Researcher**

Aug 2021 – Apr 2022

- Researched several seminal works in Blind Image Super Resolution; Reproduced, trained, & evaluated several frameworks for a fair comparison.
- Added Vision Transformer (ViT) in a CNN + Contrastive learning-based framework (2021's state-of-the-art) to further reduce the error ([link](#)).

**Pirimid Fintech**, Ahmedabad, India | **Machine Learning Intern**

Nov 2020 – Mar 2021

- Improved the Early Warning System ([link](#)) for banks that predicts risk signals for corporate loans using real-time data like stock price, news, etc.
- Developed and added a BERT-based news sentiment analysis model to predict insolvency dates for companies with an average error 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 & timestamp various moves for USA Olympics boxing athletes.
- Fine-tuned CNN-based Pose detection and Graph CNN-based Action recognition models; developed novel lightweight player pose classifier.

**AP Analytica**, Pune, India | **Deep Learning Intern**

Oct 2019 – Jan 2020

- Developed a state-of-the-art Image Segmentation-based document (like invoices) parsing model & deployed it using Flask (Heroku web app).

## RESEARCH PUBLICATIONS

CascadeTabNet: An approach for end-to-end table detection and structure recognition from image-based documents

[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 4x faster training pipelines for fine-grained image classification of 200+ animal species across image bursts using EfficientNets.
- Utilized various techniques to handle long-tailed class imbalanced dataset (of 100+ GB) & achieved solo 7th place without an ensemble.

**Video-based Real-time Human Authentication**, *Smart India Hackathon 2020, DRDO*

[[link](#)]

- Built a unified system using state-of-the-art Face Tracking + Recognition + Anti-Spoofing, Gait recognition, and Pose Estimation models.
- Deployed as a web app using HTML, CSS, Ajax, Django, MongoDB & 3 IP cameras, with real-time user registration and anti-piggy backing.

**Virtual Assistant**, *Bachelor's Thesis, 2021, Pune*

[[link](#)]

- Developed a voice-enabled virtual assistant; Fine-tuned a single model (JointBERT) for both Intent Classification & Named Entity Recognition.
- Integrated NVIDIA's Flowtron (text2speech) + JointBERT (NLU) + SQLite database (knowledge) + CMU Sphinx (speech2text) in 6 GB GPU.

**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 & Dropout baselines.

**Full stack and ML deployment projects**

- 1) Web app for hosting & scheduling Deep learning inference workloads on the remote SLURM cluster using Django, MySQL, HTML, CSS & JS.
- 2) RESTful microservice to retrieve details of a company and make Deep learning-based risk predictions using FastAPI, MongoDB & BeautifulSoup.
- 3) Intelligent traffic controlling using cameras; SVM-based traffic estimation on Raspberry Pi; web app using PHP, SQLite, HTML, CSS & JS. [[link](#)]
- 4) Mobile app to track & trace valuable goods using NFC tags, GPS location & historical reports using Android, PHP, REST API & MySQL. [[link](#)]

## SKILLS

Languages: Python, Java, C++, C, Bash, Scala  
Frontend: HTML, CSS, JavaScript, React, Ajax  
Big-Data: Apache Spark, PySpark, Hadoop

Deep Learning: PyTorch, Tensorflow, Keras  
Backend: Django, FastAPI, Flask, JSP, PHP  
MLOps: GCP, AWS, Docker, Kubernetes, SLURM, Git

Data-Sci: Scikit-learn, Numpy, Pandas  
Databases: MySQL, Oracle, MongoDB  
Other: TensorflowJS, OpenCV, Android

## ACHIEVEMENTS

- Hackathons: **Finalist** of Smart India Hackathon (India's Biggest Hackathon) 2020, 2019, & 2018; **Runner Up** of Pune Social Hackathon, 2019.
- Other: **Winner** of private Kaggle Competition, Pune PICT 2019 ([leaderboard](#)); **Shortlisted** for Google DevFest Pune 2019 (Top 1%).
- Scholarship: **Winner** of D. K. Bhawe Scholarship, by Savitribai Phule Pune University, 2021.
- Stackoverflow: 20+ answers with a 1200+ reputation on [Stackoverflow](#), and 30+ answers with an 800+ reputation on [DataScience.StackExchange](#).