

Varad Pimpalkhute

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I am currently interested in the domains of [Meta Learning](#), [Semi supervised Learning](#), [Performance Optimisation](#). Apart from this, I also like to dabble with [NLP](#), [COMSOC](#) domains. Do visit my website to know more on me.

EDUCATION

2017-2021 | **B.Tech in Electronics and Communication Engineering, IIIT Nagpur**
GPA/Rank | **8.70/10.0** | Rank : **5**

PUBLICATIONS

- **Varad Pimpalkhute**, Prajwal Nakhate and Tausif Diwan, "Transformer Models for Classification on Health-Related Imbalanced Twitter Datasets," in Proceedings of the Sixth Social Media Mining for Health (**#SMM4H**) Workshop and Shared Task, pp. 118–122, 2021. [[DOI](#) / [Link](#) / [PDF](#)]
- **Varad Pimpalkhute**, Rutvik Page, Ashwin Kothari, Kishor Bhurchandi and Vipin Kamble, "Digital Image Noise Estimation Using DWT Coefficients," in IEEE Transactions on Image Processing, vol. 30, pp. 1962-1972, 2021, doi: 10.1109/TIP.2021.3049961. [[Link](#)]
- Arjun Magge*, **Varad Pimpalkhute***, Divya Rallapalli, David Siguenza and G. Gonzalez-Hernandez, "Transformer models for classification of COVID19 posts on Twitter," Proceedings of the Sixth Workshop on Noisy User-generated Text (**W-NUT 2020**), pp. 378–382. [[DOI](#) / [Link](#) / [PDF](#)] (* Equal Contribution)
- Shivani Dhok, **Varad Pimpalkhute**, Ambarish Chandurkar, Ankit A. Bhurane, Manish Sharma, & U. Rajendra Acharya, "Automated phase classification in cyclic alternating patterns in sleep stages using Wigner–Ville Distribution based features," in Computers in Biology and Medicine, vol. 119, 103691, 2020, [[DOI](#) / [Link](#)]

RESEARCH EXPERIENCE

Computing Systems Lab, Tata Research & Innovation Labs 05/2020 - 11/2020

Topic: Accelerating Gradient Based Meta Learners

Advisor: [Dr. Rekha Singhal](#), Principle Scientist & Head of Lab

- Optimized system and model performance of a RNN based meta learner, thus achieving a speed up of 4x on training. [[Paper](#) / [Code](#)]
- Contributed to an open-source meta learning library to generalize performance optimization achieved on MAML, ANIL, etc. Additionally, incorporated Data Parallel & Distributed settings.

Health Language Processing Lab, University of Pennsylvania 07/2020 - 08/2021

Topic: Multi-task learning on multi-corpus health dataset

Advisor: [Dr. Graciela Gonzalez-Hernandez](#), Associate Professor

- Implemented and improved on existing algorithms in literature to achieve SOTA performance for extraction of health-related information (eg., age, gender, location, symptoms, etc.) using Multi-task learning from multi-corpus twitter health dataset.
- Participated in WNUT'20 shared task, where our system ranked 13th all over the world. The task was to classify COVID-19 tweets as informative or not information. [[DOI](#)]

Game Theory Group, Indian Institute of Technology, Gandhinagar 11/2018 - 07/2019

Topic: Multiwinner voting with Admissible Sets

Advisor: [Dr. Neeldhara Misra](#), Assistant Professor

- Contributed a lemma to reduce the NP-Hard problem of winner determination for connected property of candidate graph for NSAV/NAV scoring functions to polynomial time solvable for a fixed size of voters. [[Lemma](#)]
- Performed extensive research in the fields of Fair Division, Voting and studied to hardness of various problems. [Research Notes: [Voting](#), [Fair Division](#)]

TEACHING ASSISTANT

Signals & Systems Course Fall'19

ACM-W Summer School on Algorithmic Game Theory

[[Website](#)], Taught By: Dr. Ankit Bhurane

[[Website](#)], Taught By: Dr. Neeldhara Misra

UNDERGRADUATE THESIS

Geolocation Extraction of Twitter users

12/2020 - 07/2021

Group: Health Language Processing Lab, University of Pennsylvania

Advisor: Dr. Graciela Gonzalez-Hernandez, Dr. Arjun Magge

- Improved on the existing systems that only extracted location either using meta-data (Carmen), or using content-data (Pigeo) by building location database, incorporating population heuristics, user aggregation.
- We further extend the system by generating a custom dataset, and classifying location of a user using Fast-Text and Transformer Models.
- **Additional Material:** [BitBucket Code](#) / [Poster](#) / [Presentation](#) / Thesis (to be updated)

ACADEMIC PROJECTS

Tree MAML & Hierarchical MT-NET (Ongoing work)

Guide: Sébastien Arnold, Tausif Diwan

- **Motivation:** Build efficient algorithms that surpass SOTA performance on existing CV benchmark datasets.
- Extending MAML to work on tasks from different distributions. Computing the challenge of task similarity on learning space.

Metabolts, A library for high-end research in Meta learning

Guide: Sébastien Arnold

- Metabolts is a software library for meta-learning research. It builds on top of PyTorch Lightning to accelerate two aspects of meta-learning research cycle: fast-prototyping and correct reproducibility.
- We benchmarked results on MAML, ANIL, ProtoNets and MetaOPTs.
- Code Link: [GitHub Link](#)

Parkinson's Disease, A Hybrid Time-wavelet domain approach

Guide: Ankit Bhurane

- Extracted Rényi entropy and Kraskov entropy features in time-wavelet domain. Made use of a CSVM, 10-fold classifier to reduce overfitting.
- Model achieve SOTA performance with [Acc, Spec, Sen]: [99.56%, 99.24%, 99.87%] respectively.
- 2nd authored paper accepted at SPIN Conference. [[Paper](#)]

CONFERENCES & SUMMER SCHOOLS

38th IARCS Annual Conference on FSTTCS'18

10/12/2018 - 14/12/2018

ACM-W Summer School on Algorithmic Game Theory

02/07/2019 - 14/07/2019

CSA Summer School, IISc

15/07/2019 - 20/07/2019

Annual Conference of the NAACL'21, NAACL-HLT

06/06/2021 - 11/06/2021

ACTIVITIES & LEADERSHIP

- Bagged best research intern diary award at Summer Research Internship Program, IIT Gandhinagar.
- Received honorable mention for the project "Paraclate" in NASA Space Settlement Contest, USA.
- My team was in top 3 performing teams for 2 of the 3 shared tasks at SMM4H'21 Workshop.
- I was a student placement coordinator at my institute for 1.5 years. I mainly dealt with establishing network with companies, and maintaining database of upcoming internships/campus drives.
- Activities at Undergraduate Institute:
 - I was a part of the founding committee of IIITN's coding club community dotSlash (. /).
 - I was the co-head of the Line Follower event in IIITN's technical fest (Tantrafiesta).
 - I was the head for Samarth event in IIITN's cultural fest (Abhivyakti). Samarth is a theme event of Abhivyakti that seeks to spread awareness about the physically challenged children in India.

SKILLS

Programming Languages: C, Python, HDL

Libraries: PyTorch, Tensorflow 2.0, Keras

Templating: Latex, Jekyll, Markdown, HTML, CSS

Softwares: MATLAB, Raspberry Pi, CADFEKO

Frameworks: Flair, KTrain, learn2learn, Pytorch Lightning

Systems / Platforms: Git, Linux, Bash, CentOS

Data Visualization: Seaborn, Matplotlib

RELEVANT COURSEWORK

(Basic + Advanced) Data Structures, Algorithms, Discrete Mathematics, Neural Networks & Deep Learning, Digital Image & Video Processing, Signals & Systems, Programming Languages, Calculus (I & II), Numerical Methods & Analysis, Computer Architecture & Organization, Natural Language Processing.