PRADYUMNA YALANDUR MURALIDHAR

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EDUCATION

University of Tübingen   *October 2023 - Present*
MSc in Machine Learning (Supp. by an ELIZA Research-Oriented Master's Scholarship)   Grade: 1.13/1

PES University, Bengaluru   *August 2017 - May 2021*
B.Tech in Computer Science and Engineering (Honors)   CGPA: 9.95/10 (Gold Medalist)

Department of PU Education, Bengaluru   *May 2015 - May 2017*
Hymamshu Jyothi Kala Peetha PU College   Score : 96.2%

ICSE Board, New Delhi   *Jun 2005 - April 2015*
School Vivekananda, Bengaluru   Score : 95.3%

RESEARCH EXPERIENCE

Microsoft Research India   Jan 2022 - Aug 2023
Research Fellow, supervised by Dr. Manohar Swaminathan, Dr. Mohit Jain and Dr. Pratyush Kumar

· Worked on Sign Language Translation and Recognition, and on Programming with LLMs under Dr. Pratyush Kumar, Dr. Mohit Jain, and Dr. Sriram Rajamani, Director, MSR India.

Indian Institute of Science, Bengaluru ⤴   Jan 2021 - Jun 2021
Research Intern (Undergraduate thesis), supervised by Prof. Venkatesh Babu and Dr. Jogendra Nath Kundu

· Undergraduate thesis on self-adaptive 3D human pose estimation.
· Contributed towards publications in top-tier conferences like *NeurIPS* and *CVPR*.

PES Center for Pattern Recognition   Jan 2021 - Nov 2021
Research Assistant, supervised by Dr. Gowri Srinivasa and Dr. Prashant Athri (Amrita University)

· Worked on improving the predictions of outcomes of clinical trials through feature engineering and statistical models.
· Paper accepted at *Chemical Biology and Drug Design.*

Indian Institute of Science, Bengaluru ⤴   May 2020 - August 2020
Research Intern, supervised by Prof. Venkatesh Babu and Dr. Jogendra Nath Kundu

· Worked on self-supervised 3D human pose estimation and segmentation from images at the Video Analytics Lab, CDS.
· Created synthetic data pipelines for pose estimation, performed hyperparameter tuning and various ablative experiments to optimize the performance of a self-supervised pose estimation framework.
· Created a pose-transformation based data generation pipeline for person re-identification ⤴, presented at *BMVC* 2021.

Indian Institute of Science, Bengaluru ⤴   May 2019 - July 2019
Summer Research Fellow, supervised by Prof. Yogesh Simmhan

· Worked on Automated Visual Analytics for UAV's to distribute computation over edge, fog and cloud devices.
· Implemented custom-trained object detection and segmentation models for processing live video streams.
· Implemented a drone video server to store and query drone footages based on location/time.
· I presented this project at the 12th student research symposium at *HiPC*'19.

EXPERIENCE

Apple India   Jul 2021 - Dec. 2021
Software Engineer (ICT-2)

· Worked on adding features to an internal incident management application that supports Apple's system status pages.
· Worked on an end-to-end testing framework, reduced test time by 34% by parallelizing and optimizing test cases.

Department of CSE, PES University   August 2018 - March 2019
Project Assistant

· Worked under the supervision of Dr. Mamatha HR, Professor at Dept. of CSE, PESU.

· Worked on extraction of Kannada words from images using various image processing techniques such as morphological operations, projection profiles and contours, to create a dataset of Kannada words, and on recognition of various Kannada words using a CNN trained from scratch. Presented the results of this work at *ICTIS* 2021.

Elysian AI ⬀   May 2018 - August 2018
Android App Development

· Worked on an Android App, vendi. Vendi is a peer-to-peer marketplace to buy and sell phones.

PUBLICATIONS (* denotes equal contribution)

- Y.M Pradyumna, V. Ganesan, D.K Arumugam, M. Gupta, N. Shadagopan, T. Dixit, S. Segal, P. Kumar, M. Jain, S. Rajamani. PwR: Exploring the Role of Representations in Conversational Programming. arXiv 2024.

- S. Sanyal, A.R. Asokan, S. Bhambri, Y.M. Pradyumna, A. Kulkarni, J.N. Kundu, R.V. Babu. Aligning Non-Causal Factors for Transformer-Based Source-Free Domain Adaptation. In *WACV* 2024.

- J.N. Kundu, S. Seth*, Y.M. Pradyumna*, V. Jampani, A. Chakraborty, and R.V. Babu. Uncertainty-Aware Adaptation for Self-Supervised 3D Human Pose Estimation. In *CVPR* 2022.

- V. Murali*, Y. M. Pradyumna*, C. Königs, M. Nair, P. Nedungadi, G. Srinivasa, and P. Athri, Predicting clinical trial outcomes using drug bioactivities through graph database integration and machine learning. In *Chemical Biology & Drug Design*, 2022.

- J.N. Kundu, S. Seth, A. Jamkhandi, Y.M. Pradyumna, V. Jampani, A. Chakraborty, and R.V. Babu. Non-Local Latent Relation Distillation for Self-Adaptive 3D Human Pose Estimation. In *NeurIPS* 2021.

- C. Hebbi, Y.M. Pradyumna, H.R. Mamatha. Database Building, Recognition, and Categorization of Handwritten Kannada Words Using Convolution Neural Networks. In *ICTIS* 2021.

- A. Barai*, Y.M. Pradyumna*, A. Khochare and Y. Simmhan. Drone Video Management System. In the 12th students' research symposium, *HiPC* 2019.

AWARDS AND HONOURS

- Selected for a Research-oriented Master's Scholarship from Konrad Zuse School of Excellence in Learning and Intelligent systems (ELIZA).

- Selected twice for the prestigious Indian Academy of Sciences' summer research fellowship programme, in 2019 and 2020.

- Awarded Prof. CNR Rao and Prof. MRD Merit Scholarships for outstanding academic performance throughout undergraduate studies.

- Ranked 178th in KCET'17, a competitive exam attempted by about 200,000 students.

- Awarded the PES University gold medal by the honorable Vice President of India, for ranking first in the university.

- Won the third place in two challenges in Microsoft Hackathon, a world-wide hackathon event.

SELECTED PROJECTS

- **Android Project:** An app for RD agents based on the MVVM architecture, which solved a subset sum problem.
- **Algorithms Project:** Solved the multidimensional knapsack problem using genetic algorithms, using the deap library in python.
- **Microprocessors Project:** Built a smart soldier tracking system to keep track of vitals with a one-way RF communication using a force sensor for Morse code, and a flask based web app for monitoring the vitals.
- **Unified Engineering Project:** Built a robot to search a ball and take it to a goal using RaspberryPi and OpenCV.
- **Machine Learning Project:** A project on prediction of low birth weight in babies, using data cleaning, feature engineering/weighting using extremely randomized trees, and machine learning models such as ANN, and kNN.
- **Data Analytics Project:** A team project where we worked on predicting taxi fares in the city of New York, given the source and destination coordinates and other details, using various ML models like linear regression, random forests, and deep neural networks. Various new features were engineered in order to improve the predictions.
- **NLP Project:** A team project on summarizing paragraphs of text using an encoder-decoder architecture and soft attention mechanism.
- **Information Retrieval Project:** A search engine built using various boolean and vector space indices.
- **Domain Adaptation Project:** A domain adaptation algorithm that utilizes redundancy of transformer heads to improve adaptation performance.

- **Domain Generalization Project:** A project on prototype-based domain generalization. I improved the generalization performance of a ResNet-50 by around 1% on standard benchmarks.

SKILLS

- **Programming:** C, C++, Python, Kotlin, Javascript
- **Web:** Javascript, flask, NodeJS, MongoDB, SQL
- **Machine Learning/Data Science** Tensorflow, pytorch, OpenCV, pandas.
- **Tools:** LaTeX, Git, Anaconda, Jupyter.

RELEVANT COURSEWORK

Graduate: Statistical Machine Learning, Probabilistic Machine Learning, Mathematics for Machine Learning, Deep Learning, Understanding LLMs, Mathematics for Machine Learning, Computer Graphics.

Undergraduate: Machine Learning, Data Analytics, Natural Language Processing, Digital Image Processing, Algorithms for Information Retrieval, Introduction to Data Science, Engineering Mathematics - 1 and 2, Linear Algebra, Discrete Mathematics and Logic, Algorithms + Practicum, Advanced Algorithms.

MOOC COURSES AND CERTIFICATIONS

- Android App Development ⬈
- Coursera Tensorflow specialization (4/4 courses) ⬈
- Coursera Deep learning specialization (5/5 courses) ⬈
- Fundamentals of Reinforcement learning ⬈

VOLUNTEERING

- Undergraduate Teaching Assistant, Department of CSE, PES University   Jan-May 2021
  Course: Introduction to NLP, Faculty: Dr. Mamatha HR
- Undergraduate Teaching Assistant, Department of CSE, PES University   Aug-Dec 2020
  Course: Data Analytics, Faculty: Dr. Gowri Srinivasa
- Reviewer: CVPR 2023-25. ECCV 2024.
- Sub-reviewer: IJCV and T-PAMI.

REFERENCES

- **Dr. Mohit Jain**, *Principal Researcher*, Microsoft Research, Bangalore
- **Dr. Jogendra Nath Kundu**, *Research Scientist*, Meta, Redmond
- **Dr. Gowri Srinivasa**, *Professor*, PES University, Bangalore