Prabhu Teja Sivaprasad

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Experience

04/2023-Now **Applied Sciencist**, *AWS*, **Amazon Development Center Germany GmbH**.
- Method for efficient continual learning for transformers with LoRA.

09/2021-02/2022 **Applied Sciencist Intern**, *AWS*, **Amazon Development Center Germany GmbH**.
Project on large scale optimization.

11/2018-03/2023 **Research Assistant**, *Machine Learning group*, **Idiap Research Institute, Switzerland**.
- Method for adapting networks to domain shifts at inference time using augmentation robustness. Presented at NeurIPS 2021 Workshop on Distribution Shifts.
- Method for unsupervised domain adaptation for semantic segmentation. Specifically the case of source data-less domain adaptation using uncertainty quantification. Published CVPR 2021.
- Critical study of the practices of benchmarking of optimizers. Defined the notion of tunability. Large scale experimentation revealed that Adam optimizer is the most tunable of the considered list. Published at ICML 2020.
- Teaching Assistant (TA) for the course EE-559 on Deep Learning ($\sim$ 400 students) taught by Dr François Fleuret at EPFL for the spring semesters of 2020, 2021, 2022. My tasks are to hold tutorial sessions after each lecture, and to design and evaluate course projects.

4/2017-10/2018 **Research Scientist**, *Self Serviced Performance Advertising*, **Amazon Development Center India**.
- Built NLP models for auto-moderation of advertisements on Amazon site using word embeddings, sentence embeddings, cross-lingual transfer
- Productionised models for scoring millions of ads with low latency constraints.

07/2014-02/2017 **Research Engineer**, *Imaging and Computer Vision group*, **Siemens Healthineers Pvt Ltd, Bangalore**.
- Segmentation of human vertebra in Computed Tomography images: Active Shape models, Machine Learning (Random Forest) based boundary detection and Laplacian Mesh deformation
- Non-linear optimization for parameter estimation of Magnetic Resonance Imaging using Levenberg-Marquardt and Nelder-Mead (Simplex) method.
- Deep neural networks for organ detection and segmentation in Computed Tomography images.

02/2014-06/2014 **Intern**, *Imaging and Computer Vision group*, **Siemens Corporate Research and Technology, Bangalore**.
- Texture analysis for faulty steel plate detection from camera feeds.
- Large scale random forests for handling large number of medical volumes.

Education

2018-2023 **Doctor of Philosophy (PhD) in (Electrical Engineering)**, *Idiap Research Institute, École polytechnique fédérale de Lausanne (EPFL)*, Switzerland, Advisor: Dr. François Fleuret.

2015 **Master of Science (Electronics and Communication Engineering)**, *International Institute of Information Technology (IIIT-H)*, Hyderabad, India, Advisor: Dr. Anoop M Namboodiri.

2010 **Bachelor of Technology (Electronics and Communication Engineering)**, *Vellore Institute of Technology (VIT)*, Vellore, India, Advisor: R Prakash.

Publications

- *Wistuba M, Prabhu Teja, Balles L, Zappella G* **Continual Learning with Low Rank Adaptation** *NeurIPS 2023 Workshop on Distribution Shifts*[PDF]
- *Courdier E*, Prabhu Teja*, Fleuret F* **Paumer: Patch Pausing Transformer for Semantic Segmentation** *33rd British Machine Vision Conference, 2022*.
- *Prabhu Teja, Fleuret, F* **Test time Adaptation through Perturbation Robustness** *NeurIPS 2021 Workshop on Distribution Shifts*. [PDF]
- *Prabhu Teja, Fleuret, F* **Uncertainty Reduction for Model Adaptation in Semantic Segmentation** *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021.* Webpage at `https://git.io/JthPp`.
- *Prabhu Teja*, Mai, F.*, Vogels, T., Jaggi, M. and Fleuret, F* **Optimizer Benchmarking Needs to Account for Hyperparameter Tuning** *In Proceedings of the 37th International Conference on Machine Learning (ICML), 2020.* Webpage at `https://git.io/JOqV9`.
- *Prabhu Teja, Namboodiri, A* **A Ballistic Stroke Representation of Online Handwriting for Recognition.** *International Conference on Document Analysis & Recognition–2013* [PDF].

Select Projects

Machine Learning models for Ad-moderation on Amazon platform.

Designed sentence embeddings based models for advertisements to check for highly objectionable content as defined by policy management. Lead the effort on the integration between the machine learning platform and the software pipelines. Worked on transferring the knowledge base built for English to low-resource marketplaces through transfer learning.

Multi-organ detection and segmentation using deep Convolutional networks.

Designed a CNN that outputs proposal heat-maps of each organ (kidney, liver, spleen). Preliminary results show that volume proposals thus found have a high true positive rate and a low false positive rate.

Segmentation of Vertebra from CT Images.

Deviced a method that uses shape priors, and used Laplacian Mesh Deformation w ith constraints derived from the image to fit the mesh to the vertebra. Developed a prototype in MevisLab for ready deployment.

Large Scale Random Forests.

Commonly available implementations of Random Forests require all features available in memory. Built a new random forest model implementation that has on the fly feature computation, efficient data structures and storage for the weak-learners and is parallelisable. Testing it on large amounts of data (∼50GB) showed its effectiveness in real-world scenarios

Programming skills

Languages	Python, C++
Libraries	PyTorch ecosystem, Scientific Python ecosystem, LaTeX, Eigen

Professional Activities

Reviewer for ICML 2023, 2024, NeurIPS 2022, ICLR 2022, 2024, IEEE Transactions on Multimedia.