Sree Harsha Nelaturu

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Education

Universitat des Saarlandës || *MSc Visual Computing (GPA: 1.7)*** || *Saarbrücken, DE* — Oct 2021 - Present

Massachusetts Institute of Technology || *Special Student in EECS (GPA: 5.0/5.0)* || *Cambridge, MA, USA* — Sept - Dec 2018

SRM Institute of Science and Technology || *B.Tech ECE (86.18%)* || *Chennai, TN, India* — July 2016 - May 2020

[** = In the german system, 1.0 is the highest achievable grade]

Publications and pre-prints

- **INCLUDE: Evaluating Multilingual Language Understanding with Regional Knowledge:** (Angelika Romanou, Negar Foroutan, Anna Sotnikova, Zeming Chen, **Sree Harsha Nelaturu**, Shivalika Singh, and other authors) – Core contributor, pre-print under review. Advised by Marzieh Fadaee, Sara Hooker, Antoine Bosselut.
- **On the Fairness Impacts of Hardware Selection in Machine Learning** (**Sree Harsha Nelaturu***, Nishaanth Kanna Ravichandran*, Cuong Tran, Sara Hooker, Ferdinando Fioretto). Accepted **@ ICML 2024** [* = equal contribution]
- **End to End learnable masks with differentiable indexing**. (Dibyanshu Shekhar*, **Sree Harsha Nelaturu***, Ashwath Shetty*, Ilia Sucholutsky). Accepted for archival at **Tiny Papers @ ICLR2023** [* = equal contribution]
- **Accelerated CNN Training through Gradient Approximation**. (Ziheng Wang, **Sree Harsha Nelaturu**, Saman Amarsinghe). Published at EMC^2 *Workshop* at the International Symposium on Computer Architecture **(ISCA 2019)**.

Experience

Amazon Web Services || *Applied Scientist Intern* || *Tübingen, Germany* — November 2024 - May 2025

› **(November 2024 - May 2025) Manager: Dr. Jonas Kübler**. Working on benchmarking and improving quantization of LLMs.

Max Planck Institut for Informatik || *Research Assistant (HiWi)* || *Saarbrücken, Germany* — August – October 2024

› **(August - October 2024) Advisor: Dr. Jonas Fischer**. Working on Mechanistic Interpretability of f-MRI + Image reconstruction models.

CISPA Helmholtz Institute for Information Security || *Research Assistant (HiWi)* || *Saarbrücken, Germany* — July 2022 – July 2024

› **(August 2023 - July 2024) Advisor: Dr. Rebekka Burkholz**. Developed techniques for perturbation aware and accelerated methods for sparse optimization. Open sourced TurboPrune - 21x faster ground up rewrite of group's codebase.

› **(July 2022 - July 2023) Advisor: Dr. Sebastian Stich**. Worked on communication and compute efficient algorithms for federated/distributed optimization using knowledge distillation and sparsity.

Rediscovery.io || *Jr. Deep Learning Research Scientist* || *Remote - London, UK* — July. 2020 – May 2021

› Contributed to the development of the remo.ai - a dataset management and visualization tool SDK and integrated supervised/self-supervised learning methods for [classification, segmentation, object detection] in the open source SDK.

Myelin Foundry || *Deep Learning Intern* || *Bengaluru, IN*

› **(March - June 2020)** Designed an end-to-end pipeline for media restoration, upscaling and enhancement for old movies/TV-shows. Involved market research and development of on-device super-resolution for 540p -> 4K upscaling.

› **(June 2019)** Developed an optimized pipeline for training and edge deployment of ASR (Automatic Speech Recognition) for low-resource languages.

RunwayML || *ML Researcher (Consultant)* || *Remote - Brooklyn, USA* — Sept. 2019 – Jan. 2020

› Added 22+ optimized CV, NLP models to the Runway model zoo – including generative, processing and task oriented models via an intuitive interface in the SDK easily accesible by creatives/artists. Details here.

Response Environments, MIT Media Lab || *Undergraduate Researcher* || *Cambridge, MA, USA* — Sept., - Dec., 2018

› Developed an information delivery pipeline using DNNs to classify and subsequently modifying a user's audio-stream. Achieved highest possible "A" grade as part of course 6.100 - EECS Project.

Communities and Volunteering

CohereForAI (C4AI) || *Community Lead and Researcher* || *Remote* 2022 - Present

- Founded and co-led the ML Theory group and currently co-lead the ML efficiency group. Present research papers, organize guest lectures and workshops in the community. Top 1% active community members.
- Worked on a project advised by Sara Hooker (C4AI) and Prof., Ferdinando Fioretto (U. Virginia) on the fairness impacts of hardware selection as a C4AI community researcher.
- Currently working on a community-member led project on **efficient and fair federated learning** leveraging sparsity training.

Awards and Conferences

- **Federated Learning Practical, Deep Learning Indaba (Sept 2024):** In collaboration with Andrej Jovanović and Luca Powell
- **Best use of OpenAI API (Feb 2021):** Stanford TreeHacks
- **Eastern European Machine Learning School (EEML) (2021, 2022):** Accepted based on original research proposal.
- **Silver Medal (Feb 2019):** SRM Research Day
- **First Place Winner (Dec 2017):** Microsoft GAINS AI Hackathon
- **First Place Winner, (Dec 2017):** ImagingHub Smart Home Competition
- **Innovation Award, March 2017:** Smart India Hackathon (Ministry of Electronics and IT)

References

- **(Thesis Advisor) Dr. Rebekka Burkholz, CISPA Helmholtz Center for Information Security:** burkholz@cispa.de
- **(Research Advisor) Dr. Sara Hooker, Cohere For AI:** sarahooker@cohere.com
- **(Research Advisor) Dr. Ferdinando Fioretto, University of Virgina:** fioretto@virginia.edu

Skills and Interests

- **Tools and frameworks:** PyTorch, TensorRT, JAX, OpenVINO, CUDA, DeepSpeed, Transformers, HuggingFace, TVM
- **Interests:** Efficient training/optimization methods [distributed, federated], Transformers, Sparsity, Pruning, Quantization, Computer Vision and low-resource inference.

Links

- **Website:** https://nelaturuharsha.github.io/
- **INCLUDE**: https://arxiv.org/abs/2411.19799
- **On The Fairness Impacts of Hardware Selection in Machine Learning :** - https://arxiv.org/abs/2312.03886
- **Accelerated CNN Training Through Gradient Approximation:** https://www.emc2-ai.org/assets/docs/isca-19/emc2-isca19-paper3.pdf
- **TurboPrune:** https://github.com/nelaturuharsha/TurboPrune