Sree Harsha Nelaturu

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🎓 Education

Universitat des Saarlandës ‖ *MSc Visual Computing (GPA: 1.9)*** ‖ *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]

🥧 Experience

CISPA Helmholtz Institute for Information Security ‖ *Research Assistant (HiWi)* ‖ *Saarbrücken, Germany*   July 2021 – Present

> **(July 2022 - Present) Advisor: Dr. Rebekka Burkholz**. Working on new accelerated perturbation aware methods for finding lottery tickets by use of neuron level pruning.

> **(July 2021 - July 2022) 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.

⚗ Publications and pre-prints

- **On the Fairness Impacts of Hardware Selection in Machine Learning** (*Sree Harsha Nelaturu**, Nishaanth Kanna Ravichandran*, Cuong Tran, Sara Hooker, Ferdinando Fioretto). arXiv pre-print (under-review) [* = 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)**.

⚗ 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 (UvA) 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

- **Best use of OpenAI API (Feb 2021):** Stanford TreeHacks
- **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)
- **Eastern European Machine Learning School (EEML) (2021, 2022):** Accepted based on original research proposal.

⚙ 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.