SAI SREE HARSHA

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EDUCATION

National Institute of Technology, Karnataka — Surathkal, India
Bachelor of Technology in Computer Science and Engineering — Aug 2018 - May 2022 (expected)

Cumulative GPA: 9.66/10 | **Rank: 1/117** [Link to Rank Certificate]

Relevant Courses: Data Structures & Algorithms, Discrete Mathematics, Operating Systems, Database Systems, Linear Algebra, Machine Learning, Artificial Intelligence, Data Warehousing & Mining, Image Processing

EXPERIENCE

Mila, Quebec AI Institute — Montreal, Canada
Research Intern at REAL | Advisors: Dr.Liam Paull, Dr.Derek Nowrouzezahrai — April 2021 - Present

- Developed a pipeline to demonstrate the occurrence of catastrophic forgetting when a neural coordinate map such as a NeRF is trained in an online setting.
- Incorporated continual learning techniques such as distillation, experience replay and GEM to alleviate catastrophic forgetting and improve image reconstruction quality by up to 24%.
- The proposed method ensures positive backward transfer of up to 2 dB PSNR and enables the adoption of neural coordinate maps as a sparse scene representation for SLAM.
- Explored the ability of various voxel based and surfel based differentiable renderers to provide accurate gradients with respect to geometry for self-supervised depth estimation leveraging the gradSLAM framework.

Oracle, India — Bangalore, India
Summer Intern with the Fusion Analytics Warehouse(FAW) team — April 2021 - July 2021

- Developed software to extract and analyze data regarding customer usage of the Oracle FAW platform.
- Designed the data warehouse schema and implemented an ETL pipeline which supports incremental loads and is deployed using OCI Functions to run in a serverless manner, minimizing resource consumption.
- Leveraged various supervised learning and clustering algorithms to model customer behavior.
- Identified key performance indicators and visualized them effectively to provide actionable insights to the product development team and drive informed decisions. [Link to Certificate]

Video Analytics Lab, **Indian Institute of Science(IISc)** — Bangalore, India
Research Intern | Advisors: Dr.Venkatesh Babu, Dr.Varun Jampani(Google Research) — April 2020 - June 2021

- Developed a self-supervised approach for detecting landmarks from a category specific collection of images.
- Leveraged the BYOL framework to learn an instance level representation and used the correspondence-matching property to learn a dense pixel-level representation.
- Achieved improvements of up to 10% in terms of inter-ocular distance over prior works, on challenging datasets, while attaining improvements of up to 45% over the previous best, in the few-shot learning setting.
- Representations learned are highly compact (60 times smaller in dimensionality than prior works), significantly reducing memory requirements and leading to 55 times faster training speeds. This work has been accepted at **WACV 2022**. [Link to Paper]

Indian Academy of Sciences — Bangalore, India
Summer Research Fellow at IIST Trivandrum | Advisor: Dr.Deepak Mishra — May 2020 - December 2020

- Performed an extensive comparative study of different pooling techniques for graph neural networks.
- Designed a graph pooling method that collects second-order statistics and leverages neural networks to learn relationships among node representations.
- Achieved up to 4% improvement in graph classification accuracy and a reduction of up to 51% in standard deviation across multiple cross-validation runs, compared to previous works.

- Attained consistent enhancement in performance across a range of 9 datasets in the bioinformatics and social network domains.

I3D Lab, Indian Institute of Science(IISc) Bangalore, India
Winter Intern | Advisor: Dr.Pradipta Biswas December 2019 - January 2020

- Developed a JavaScript based web application for the Pointing Task. The task is based on Fitts's Law, and follows the ISO 9241-9 standard which is used as the standard metric to evaluate pointing devices.
- Analyzed the cursor movement trajectories, obtained upon completion of the pointing task and visualised metrics as a radially stacked bar chart.[Link to Website] [Link to Certificate]

ACCEPTED PUBLICATIONS

LEAD: Self-Supervised Landmark Estimation by Aligning Distributions of Feature Similarity
Tejan Karmali*, Abhinav Atrishi*, **Sai Sree Harsha**, Susmit Agrawal, Varun Jampani, Venkatesh Babu R
*2022 IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV 2022**)*

Neural Pooling for Graph Neural Networks
Sai Sree Harsha, Deepak Mishra
9th International Conference on Pattern Recognition and Machine Intelligence, 2021
Accepted for publication in Springer Lecture Notes in Computer Science (LNCS) (Forthcoming)

NeuralDoc-Automating Code Documentation using Machine Learning
Sai Sree Harsha, Aditya Sohoni, K.Chandrasekaran
10th International Symposium on Embedded Computing and System Design, 2021
Accepted for publication in Springer Lecture Notes in Electrical Engineering (LNEE) (Forthcoming)

TECHNICAL SKILLS

Programming Languages	Python, C++, C, Javascript
Frameworks & Libraries	PyTorch, Keras, TensorFlow, OpenCV, NumPy, Pandas, Django, Node.js
Platforms & Tools	Git, Jupyter, Docker, Fn Project, Oracle Cloud Infrastructure (OCI)

SELECTED PROJECTS

Pruning Challenge. Applied weight and neural pruning techniques on neural networks and demonstrated their ability to retain same accuracy with model size on disk reduced to 20% of its initial size.[Link to Code]

Single View 3D-Reconstruction. Developed the novel semantic vertex part segmentation technique for self-supervised single view 3D-reconstruction. Proposed new loss functions for 3D semantic consistency and camera rotation regularization to improve mesh reconstruction quality. Achieved up to 5% increase in IoU and 12% increase in PCK as compared to prior works.[Link to Code]

PCB Fault Detection. Designed a deep learning model to identify defective Printed Circuit Boards using models such as ResNet, DenseNet, and AlexNet. Achieved an accuracy of 73.6% with just 0.5% false positives.[Link to Code]

NeuralDoc. Developed a novel approach for automatic Python and Java code documentation by integrating Transformers, the copy attention mechanism and the use of a pre-trained BERT model. Achieved up to 19% higher BLEU, 18% higher METEOR and 6% higher ROUGE-L score as compared to 7 other existing methods. Deployed the system as a web application using Streamlit.[Link to Code]

De-biasing Word Vectors. Implemented the debiasing algorithm from, Bolukbasi et al., 2016 for removing female/male gender stereotypes in word embeddings used in NLP tasks.[Link to Code]

Night Owl. Built a web application using Django to ease the process of ordering food from the night canteens in the university campus.[Link to Code]

ACHIEVEMENTS

- Selected for the Indian Academy of Sciences, Summer Research Fellowship Program, 2020.[Link to Certificate]
- Secured 99.4 percentile score in the JEE Mains examination among 1.5 million candidates, 2018.
- Secured 97.4% in AISSCE conducted by the Central Board of Secondary Education, 2018.
- Secured a rank of 1360 among 1,72,000 candidates in the KVPY examination, 2017.[Link to Certificate]
- Awarded the Certificate of Merit by the Central Board of Secondary Education for being in the top 0.1% of successful candidates in AISSE and AISSCE, 2016 & 2018.[Link to Certificate]
- Awarded the the Vasantharathna Foundation's Award for Excellence in Leadership, 2017.[Link to Certificate]

EXTRA-CURRICULAR ACTIVITIES

- **Volunteer, ICML 2021**
  Tested the conference website, identified issues and made feature requests to improve user experience.
  [Link to Certificate]

- **Executive Member, Web Enthusiasts' Club, NITK, Surathkal**
  Conducted knowledge sharing sessions on various topics in machine learning. Conducted Kaggle sessions for data science contests as part of the club's activities. Assisted in organizing hackathons for undergraduate students in the campus.