

Srinidhi Hegde

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Education

- University of Maryland, College Park 2021 - 2023
M.S., Computer Science Overall GPA: 3.97/4
(Relevant Coursework: Computer Processing of Pictorial Information, Advanced Numerical Optimization, Advanced Statistical Pattern Recognition, Algorithms in Machine Learning: Guarantees and Analyses, Computational Methods)
- Indraprastha Institute of Information Technology Delhi 2013 - 2017
B.Tech, Computer Science and Engineering Overall GPA: 8.63/10
(Relevant Coursework: Machine Learning, Computer Vision, Convex Optimization, Probabilistic Graphical Models, GPU Computing, Computer Graphics, Artificial Intelligence, Modern Algorithm Design)

Work Experiences

- Research Assistant, University of Maryland, College Park March, 2023 - Present
Advisor: Prof. Matthias Zwicker
 - Designing new neural point cloud rendering methods with high fidelity and realism and prototyping and evaluating their performances.
 - Collaborating on scientific exploration and analysis of a mixed AR/VR tool with integrated Lagrangian Dynamics (LD) to help scientists identify, track, and understand the evolution of Earth Science phenomena in the NASA GEOS model.
- Research and Development Intern, Kitware Inc., Carrboro Jun, 2022 - Jul, 2022
Advisors: Dr. Brian Clipp, Dr. Christopher Funk
 - Developing AR-based multi-modal egocentric activity recognition framework using RGB-D and hand poses from HoloLens2
 - Designing two-stage neural network architecture - stream-specific feature extractor and temporal sequence classifier
 - Contributing new features to Kitware's open-source AR-based inspection framework [ANGEL system](#) which include - support for multi-stream inputs and synchronized listeners for multi-modal data reception via ROS
- Researcher, TCS Innovation Labs, New Delhi Aug, 2017 - Jul, 2021
Advisors: Ms. Ramya Hebbalaguppe, Dr. Lovekesh Vig
 - Deep Model Optimization - Compressing the memory-intensive DNN models using variational methods and knowledge distillation. Compressed CNNs and MLPs by 213× and 64× respectively
 - Unsupervised Animation Transfer - A geometry invariant animation transfer technique using motion cues from 2.5D (RGB-D) videos to animate target deformable 3D meshes
 - In-air Gestural Interface for AR - Hand gesture classification through fingertip coordinate regression for touch-less interactions in AR. Classified hand gestures with an 88% accuracy
 - Situated Visualisation in AR - Visual saliency based non-intrusive and temporally coherent overlay placement solution for AR/video applications
- Research Intern, TCS Innovation Labs, New Delhi May, 2016 - Aug, 2016
Advisors: Ms. Ramya Hebbalaguppe, Dr. Ehtesham Hasan
 - Designing frugal AR framework (costing only \$15) with Google Cardboard for Android Platform
 - Proposing and developing a near-real time (< 0.4s) simple hand gesture interaction technique for a frugal AR framework
 - Implementing deep learning backed industrial inspection framework for repair and maintenance of complex systems

Representative Publications

- M. Gwilliam, S. Hegde, L. Tinubu, A. Hanson. "Rethinking Common Assumptions to Mitigate Racial Bias in Face Recognition Datasets". Human-centric Trustworthy Computer Vision From Research to Applications, International Conference on Computer Vision (ICCV) (Oral, Runner-up, Best Paper Award), 2021 [\[Paper\]](#) [\[Code\]](#)
- A. Khattar, S. Hegde, R. Hebbalaguppe. "Cross-Domain Multi-task Learning for Object Detection and Saliency Estimation". Workshop on Continual Learning in Computer Vision, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021 [\[Paper\]](#)
- S. Hegde, R. Prasad, R. Hebbalaguppe, V. Kumar. "Variational Student: Learning Compact and Sparser Networks in Knowledge Distillation Framework". IEEE 45th International Conference on Acoustics, Speech, and Signal Processing (ICASSP) (Oral), 2020 [\[Paper\]](#)
- S. Hegde, J. Maurya, R. Hebbalaguppe, A. Kalkar. "SmartOverlays: A Visual Saliency Driven Label Placement for Intelligent Human-Computer Interfaces". IEEE Winter Conference on Applications of Computer Vision (WACV), 2020 [\[Paper\]](#) [\[Website\]](#)

Technical Skills

- **Expertise Area:** *Computer Vision, Machine Learning, Computer Graphics, and Mixed Reality*
- **Programming Languages:** *Python, C++, C, Java, MATLAB, R*
- **Tools:** *Pytorch, Nerfstudio, OpenGL/GLSL, CUDA, Blender, Android Studio, Unity, CryEngine*

Academic Projects

- **Robust 3D Reconstruction of Indoor Scenes using Deep Learning**
Advisors: Dr. Saket Anand and Dr. Ojaswa Sharma [\[PDF\]](#) [\[Dataset\]](#) [\[Video\]](#)
 - CNN based end-to-end reconstruction of the indoor scenes through 3D camera relocalization and depth estimation
 - Inferring with a single RGB image and registering the 3D reconstructed patches through ICP algorithm
 - Tools & technology: Caffe, KinectFusion, Theano, PCL, OpenCV
- **3D Vegetation Modelling with L-systems using an Image**
Advisor: Dr. Ojaswa Sharma [\[PDF\]](#) [\[Code\]](#)
 - Generating 3D vegetation models from RGB images by procedural skeletonization using L-Systems
 - Developing a UI to convert a single captured image of tree to a 3D model using user-guided brush strokes
 - Tools & technology: Qt/C++, OpenGL, GLSL
- **Learning Individually Fair Graph Neural Networks**
Advisor: Dr. Furong Huang [\[PDF\]](#) [\[Code\]](#)
 - Modeling the Individual Fairness through Lipschitz Criteria and Variational Dropout for Graph Neural Networks (GNN)
 - Exploring the properties of a dataset to train Individually Fair NN
 - Tools & technology: Python, PyTorch
- **Evaluating Complex Visual Question Answering**
Advisors: Dr. Jordan Boyd-Graber [\[Poster\]](#)
 - Creating a new VQA dataset comprising of 3000 beyond "What is?" questions with 10% perturbation with increasing lexical complexity measured with Question length, readability, complexity, and question and answer difficulty.
 - Fine-tuning OFA multi-tasking model for evaluation. Evaluation metrics used Accuracy and WUPS.
 - Tools & technology: Pytorch, Huggingface Transformers

Teaching Experiences

- Graduate Teaching Assistant, at UMD: CMSC 216 - Introduction to Computer Systems (Spring'22, Spring'23), CMSC 132 - Object-Oriented Programming II (Fall'22).
- Undergraduate Teaching Assistant, CSE 560 - GPU Computing at IIITD, Winter 2017, graduate Refresher Module of Data Structures and Algorithms, 2015.

Professional Services

- Reviewer: SIGGRAPH'24, AAAI'22,'23, TCSVT'21,'22
- Student Reviewer: Admissions 2022 at the University of Maryland
- Member: The Computer Vision Foundation, IEEE Signal Processing Society

Awards and Achievements

- **Dean's Teaching Excellence Award** 2017 for best teaching assistant for GPU Computing course offered at IIIT Delhi.
- Received **TCS Citation Award** and **IP Creation Award** from Tata Consultancy Services for an outstanding contribution to the organization through publications.
- Selected for **Eastern European Machine Learning Summer School 2019**, held at Politehnica University of Bucharest, Romania.
- Qualified for **Computer Vision and Machine Learning Summer School 2017**, organised by Centre for Visual Information Technology, IIIT Hyderabad.
- Selected for fully-funded scholarship for attending **CVS Vista Summer School 2017** conducted at **York University, Canada**.

Positions of Responsibility

- Mentor for PanIIT Hackathon. Mentored the teams that finished at 3rd and 4th positions in the event. - TCS-PanIIT Conclave 2019 - Jan, 2019
- Publicity & Jury Team - Research Showcase'17, IIITD - Feb, 2017 - Apr, 2017
- Event Head - BrainFuzz, the algorithm design contest, at Esya'16, IIITD - May, 2016 - Aug, 2016
- Rendering Team and Core Team, Virtual Campus Project at IIITD - May, 2015 - Dec, 2015
- Moderator for Rebuttal - Online Debate Event at Esya - IIITD's Tech Fest - Aug, 2014