Siddeshwar 'Sid' Raghavan

– Continual Learning – Foundational Models – 3D Computer Vision – Image Segmentation –

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EDUCATION

Purdue University — West Lafayette, Indiana, USA
Ph.D. Electrical and Computer Engineering — *Jan 2022 - Present*

University of Wisconsin-Madison — Madison, Wisconsin, USA
M.S Electrical Engineering (Research) — *Aug. 2019 – May 2021*

PSG College of Technology — Coimbatore, India
B.E Electronics and Communication Engineering — *Jul. 2014 - May 2018*

EXPERIENCE

Graduate Research Assistant - Advised by Prof. Fengqing Zhu — May 2022 – Present
Purdue University

- Designed and developed a continual learning computer vision algorithm to classify real-world food consumption patterns generated by our probabilistic framework (**Skills: Python, PyTorch, CUDA, Linux, Git**) [WACV 2024]
- Researched and developed a long-tailed continual learning algorithm using a two-stage contrastive learner framework and a gradient balancing loss to classify patterns, achieving an average 15% improvement over SoTA solutions [CVPRW 2024]
- Developed a computer vision algorithm for 3D generation of food objects from 2D images using diffusion models. Reduced FID by 10 points compared to current solutions [Under review]
- Building computer vision continual learning frameworks utilizing LLMs, foundation models, knowledge distillation and generative replay mechanisms
- Developing food image segmentation pipelines for comprehensive image-to-nutrient analysis

Graduate Teaching Assistant and Mentor - VIP Projects — Aug 2024 – Present
Purdue University

Graduate Research Assistant - Advised by Prof. Yin Li — Jan 2020 – May 2021
University of Wisconsin-Madison

- Developed a computer vision system for regressing and reconstructing intensity images from NLOS measurements using 3D ResNet deep learning models with a PSNR of 33.7 dB (**Skills: Python, PyTorch, Blender, Linux, Git, Docker**) [IEEE TPAMI 2022]
- Final thesis - 2D NLOS Human Pose Estimation using a hybrid CNN and LSTM network. Predicted the pose with an accuracy of 91%

Lead Graduate Teaching Assistant - Digital Fundamentals — Jan 2021 – May 2021
University of Wisconsin-Madison

Engineering Intern — Sept 2018– May 2019
Adori Labs, India

- I designed and developed a voice assistant SDK for the Adori Player, created Amazon Alexa Skills and Google Home Actions, and designed a search module for their audio engagement and analytics platform (**Skills: Python, Swift, C++, AWS/GCloud, REST APIs, User-study, UX design**)

Business Analytics Intern — Dec 2017 – Apr 2018
Thorogood Associates, India

- Final semester undergraduate internship, where I architected, designed, and developed a supply chain module for an FMCG giant using SQL Server, SSIS, and SSRS

Research Intern - advised by Prof. Rajbabu Velmurugan — Jun 2017 – Jul 2017
Indian Institute of Technology Bombay, India

- I worked on a weakly supervised Visual SLAM project and developed a single camera system (rather than a conventional multi-camera setup)

RESEARCH PUBLICATIONS

1. DELTA: Decoupling Long-Tailed Online Continual Learning (**Siddeshwar Raghavan**, Jiangpeng He, Fengqing Zhu) [CVPR Workshop 2024][Paper][Code]
2. Online Class-Incremental Learning for Real-World Food Image Classification (**Siddeshwar Raghavan**, Jiangpeng He, Fengqing Zhu) [WACV 2024][Paper][Code]
3. MetaFood3D: Large 3D Food Object Dataset with Nutrition Values (Yuhao Chen, Jiangpeng He, Chris Czarnecki, Gautham Vinod, Talha Ibn Mahmud, **Siddeshwar Raghavan**, Jinge Ma, Dayou Mao, Saeejith Nair, Pengcheng Xi, Alexander Wong, Edward Delp, Fengqing Zhu)[ArXiV 2024][Paper][Website]
4. Physics to the rescue: Deep non-line-of-sight reconstruction for high-speed imaging (Fangzhou Mu, Sicheng Mo, Jiayong Peng, Xiaochun Liu, Ji Hyun Nam, **Siddeshwar Raghavan**, Andreas Velten, Yin Li)[IEEE TPAMI 2022][Paper][Code]
5. Towards non-line-of-sight photography (Jiayong Peng, Fangzhou Mu, Ji Hyun Nam, **Siddeshwar Raghavan**, Yin Li, Andreas Velten, Zhiwei Xiong) [arXiV 2021]

POSITIONS OF RESPONSIBILITY

1. **Reviewer - Prominent machine learning and computer vision conferences and journals** [WACV-25, ICPR-24, MMSP-24, Elsevier, ICIP-24, CVPRW-24, ICME-23, CVPR-23, NeurIPS-23]
2. **Graduate student mentor** - Vertically Integrated Projects (VIP)
   Developing frameworks for projects in signal processing and computer vision, while mentoring and supporting undergraduate honors students involved in these projects.
3. **Purdue Graduate Student Government - Life Team Co.Chair** - Managing funds, organizing social events for 10,000+ graduate students to promote a memorable graduate student experience and support mental well-being.

RELEVANT COURSEWORK

1. **Mathematics courses** : Probability(A), Linear Algebra(A), Differential Equations(A), Calculus (A+)
2. **Core Courses** : Digital Signal Processing(A), Digital Image Processing I(A), Statistical Machine Learning(A), Principles of Digital Color Imaging Systems (A+), Image Processing (A+), Computer Vision (A+), Artificial Neural Networks (A+), Medical Imaging Systems (A+), Machine Learning in Biomedical and Healthcare (A+)