Divya Kothandaraman

Email | Google Scholar | Website | GitHub | Twitter

Research Interests

My broader research interests lie at the intersection of computer vision, deep learning and multi-modal learning. My recent works range from developing novel methods for generative AI tasks in controllable image and video generation such as personalization and aerial-view synthesis to developing deep learning based solutions for computer vision tasks such as domain adaptation and video action recognition. I look forward to contributing and gaining experience in diverse areas of AI.

Education

University of Maryland College Park, USA - PhD in Computer Science (Fall 2020 - Summer 2024)
Advisor: Prof. Dinesh Manocha
Committee: Prof. Ming Lin, Prof. Tianyi Zhou, Prof. Jia-Bin Huang

Indian Institute of Technology Madras, India - Bachelor of Technology in Electrical Engineering & Master of Technology in Data Sciences (Fall 2015 - Spring 2020)

Publications

[16] Taewon Kang, **Divya Kothandaraman**, Ming Lin, Dinesh Manocha. "HawkI++: Novel View Synthesis from a Single Image with Pretrained Diffusion Guidance". (Under Review)
[15] **Divya Kothandaraman**, Ming Lin, Dinesh Manocha. "Blending Concepts with Text Control in Diffusion Models using the Black Scholes Algorithm". (Under Review) Paper
[14] **Divya Kothandaraman**, Tianyi Zhou, Ming Lin, Dinesh Manocha. "HawkI: Homography and Mutual Information Guidance for 3D-free Single Image to Aerial View". (Under Review) Paper
[13] **Divya Kothandaraman**, Kuldeep Kulkarni, Sumit Shekhar, Balaji Vasan Srinivasan, Dinesh Manocha. "ImPoster: Text and Frequency Guidance for Subject-Driven Action Personalization using Diffusion Models". (Under Review)
[12] **Divya Kothandaraman**, Kihyuk Sohn, Ruben Villegas, Paul Voigtlaender, Dinesh Manocha, Mohammad Babaeizadeh. "Text Prompting for Multi-Concept Video Customization by Autoregressive Generation". AI for Content Creation (AI4CC) Workshop at Conference on Computer Vision and Pattern Recognition (CVPR) 2024 Paper
[11] Ruiqi Xian, Xijun Wang, **Divya Kothandaraman**, Dinesh Manocha. "PMI Sampler: Patch similarity guided frame selection for Aerial Action Recognition". IEEE/ CVF Winter Conference on Applications of Computer Vision (WACV) 2024 Paper

[10] **Divya Kothandaraman**, Tianyi Zhou, Ming Lin, Dinesh Manocha. "Aerial Diffusion: Text Guided Ground-to-Aerial View Translation from a Single Image using Diffusion Models". Siggraph Asia 2023 (Conference Proceedings - Technical Communications, 8 mins Oral) Paper

[9] **Divya Kothandaraman**, Ming Lin, Dinesh Manocha. "DifFAR: Differentiable Frequency-based Disentanglement for Aerial Video Activity Recognition". IEEE International Conference on Robotics and Automation (ICRA) 2023 Paper

[8] **Divya Kothandaraman**, Sumit Shekhar, Abhilasha Sancheti, Manoj Ghuhan, Tripti Shukla, Dinesh Manocha. "DistillAdapt: Source Free Active Visual Domain Adaptation". IEEE/ CVF Winter Conference on Applications of Computer Vision (WACV) 2023 Paper

[7] James Mullen, **Divya Kothandaraman**, Aniket Bera, Dinesh Manocha. "Placing Human Animations into 3D Scenes by Learning Interaction and Geometry-Driven Keyframes". IEEE/ CVF Winter Conference on Applications of Computer Vision (WACV) 2023 Paper

[6] **Divya Kothandaraman**, Tianrui Guan, Xijun Wang, Sean Hu, Ming Lin, Dinesh Manocha. "FAR: Fourier Disentangled Space Time Attention for UAV Activity Recognition". European Conference on Computer Vision (ECCV) 2022 Paper

[5] Tianrui Guan, **Divya Kothandaraman**, Rohan Chandra, Dinesh Manocha. "GANav: Group-wise Attention Network for Classifying Navigable Regions in Unstructured Outdoor Environments". IEEE Robotics and Automation Letters (RA-L) 2022 and IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2022. Project Page

[4] **Divya Kothandaraman**, Rohan Chandra, Dinesh Manocha. "SS-SFDA: Self-Supervised Source Free Domain Adaptation for Road Segmentation in Hazardous Environments". IEEE/CVF International Conference on Computer Vision Workshops (ICCV-W) 2021 (Oral). Project Page

[3] **Divya Kothandaraman**, Rohan Chandra, Dinesh Manocha. "BoMuDA: Boundless Multi-Source Domain Adaptive Segmentation in Unconstrained Environments". IEEE/CVF International Conference on Computer Vision Workshops (ICCV-W) 2021 Project Page

[2] **Divya Kothandaraman**, Athira Nambiar, Anurag Mittal. "Domain Adaptive Knowledge Distillation for Driving Scene Semantic Segmentation", IEEE/CVF Winter Conference on Applications in Computer Vision Workshops (WACV-W) 2021 Paper Slides

[1] Varun Sundar, Sumanth Hegde, **Divya Kothandaraman**, Kaushik Mitra. "Deep Atrous Guided Filter for Image Restoration in Under Display Cameras". European Conference on Computer Vision Workshops (ECCV-W) 2020 Paper

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Patents

[2] **Divya Kothandaraman**, Kuldeep Kulkarni, Sumit Shekhar, Balaji Vasan Srinivasan, Dinesh Manocha. "ImPoster: Frequency Guidance for Subject Driven Action Transfer from Image using Diffusion Models". (US Patent with Adobe Research and UMD - under review).

[1] **Divya Kothandaraman**, Sumit Shekhar, Abhilasha Sancheti, Manoj Ghuhan, Tripti Shukla. "Systems and Methods for Active Domain Adaptation". US Patent App. 17/648,482, 2023.

Internships

Research Intern, Google DeepMind *Mountain View, California,* May 2023 - Aug 2023

- Personalized video generation with Mohammad Babaeizadeh, Kihyuk Sohn and Ruben Villegas; paper at AI4CC Workshop @ CVPR 2024.

Research Intern, Adobe Research *Remote,* May 2022 - Aug 2022

- Personalized image generation with Kuldeep Kulkarni; paper under review.

Research Intern, Adobe Research *Remote,* May 2021 - Aug 2021

- Domain adaptation with Sumit Shekhar. Paper published at WACV 2023.

Research Intern, Intel *Remote,* Aug 2020 - Jan 2021

- Incremental few-shot object detection in Unstructured Traffic Environments

RnD intern, Samsung Research Institute *Bangalore, India* May 2018 - July 2018

- Advanced technologies lab, Researched single-view 3D reconstruction for AR

Research Intern, Indian Institute of Science Bangalore

Advisor: Prof. Venu Madhav *Bangalore, India* May-Jul '17&Dec '17

- Multi-view 3D reconstruction and motion averaging for Iterative Closest Point Algorithm

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Talks

- [Invited Talk, Mar 2024] 3D-free Text Controlled Aerial-View Synthesis from a Single Image using Diffusion Models, High-Beams Seminars,University College London (UCL)
- [Contributed Talk, Dec 2023] Aerial Diffusion: Text Guided Ground to Aerial View Synthesis using Diffusion Models, SIGGRAPH Asia 2023
- [Contributed Talk, Jan 2023] SALAD: Source-free Active Label Agnostic Domain Adaptation, WACV 2023
- [Contributed Talk, Oct 2021] SS-SFDA: Self-Supervised Source Free Domain Adaptation for Road Segmentation in Hazardous Weather Conditions, ICCV-W 2021

Professional service

- Reviewer:
  - Journals - TIP (2021), TPAMI (2023), IEEE-RAL (2023-24)
  - Conferences - CVPR (2022-24), ECCV (2022-24), WACV (2023-25), AAAI (2023-25), ICCV (2023), NeurIPS (2024), ICRA (2024), BADUE IROS (2023), AI4CC CVPR (2024)
- Committee member, UMD CS Graduate School Applications 2021, 2022, 2023
- GradCo CS Peer Mentor, UMD (Spring 2022, Fall 2022)

Awards

- Travel grant from Google for CVPR 2024
- ICSSA and Goldhaber Travel grant award from UMD for SIGGRAPH Asia 2023
- Dean's Fellowship 2020, University of Maryland College Park

- Secured All India Rank 1065 in Joint Entrance Exam Advanced 2015, taken by 1.3 million students (99.92 percentile).
- Qualified for INChO (Indian National Chemistry Olympiad) 2015, state top 1% in NSEP (physics olympiad) and NSEC (chemistry olympiad).

Teaching

Jul-Nov 2019: Teaching Assistant for the course EE4708, Data Analytics Laboratory, IIT Madras
Jan -May 2020: Teaching Assistant for EE1101 Signals and Systems, IIT Madras

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Research Mentorship

- Mukund Shankar and Pranav Dulepet (Undergrads, UMD, Spring 2024) - work on novel view synthesis
- Taewon Kang (Incoming UMD PhD, Summer 2024) - work on novel view synthesis, paper under submission

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