Abhishek Aich

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Work Experience

April 2023-Present · **NEC Laboratories, America,** San Jose, California, USA
Researcher, Media Analytics Department
- Focus: Agentic AI, Vision-Language Models, Open-Vocabulary Perception, Efficient Vision Transformers.

Jun 2022-Sep 2022 · **NEC Laboratories, America,** San Jose, California, USA
Research Intern, Media Analytics Department
- Mentor: Yumin Suh, Manmohan Chandraker
- Focus: Dynamic Networks for Multi-Task Learning.

Jun 2021-Sep 2021 · **Mitsubishi Electric Research Laboratories,** Cambridge, Massachusetts, USA
Research Intern, Computer Vision Group
- Mentor: Kuan-Chuan Peng
- Focus: Video Anomaly Detection.

Jun 2020-Sep 2020 · **United Imaging Intelligence, America,** Cambridge, Massachusetts, USA
Research Intern, Vision and Robotics Group
- Mentor: Ziyan Wu, Srikrishna Karanam, Meng Zheng
- Focus: Video-based Person Re-Identification.

Education

2018-2023 · **University of California, Riverside,** USA
Ph.D. in Electrical and Computer Engineering
Advisor: Amit K. Roy-Chowdhury

2016-2018 · **National Institute of Technology, Tiruchirappalli,** India
M.S.(Research) in Electronics and Communication Engineering
Advisor: P. Palanisamy

2011-2015 · **Biju Patnaik University of Technology,** India
B.Tech. in Electronics and Communication Engineering

Publications (⚙ Google Scholar profile, *: joint first authors)

NeurIPS 2025 · **iFinder: Structured Zero-Shot Vision-Based LLM Grounding for Dash-Cam Video Reasoning**
Manyi Yao, Bingbing Zhuang, Sparsh Garg, Amit Roy-Chowdhury, Christian Shelton, Manmohan Chandraker, <u>Abhishek Aich</u>
Advances in Neural Information Processing Systems, 2025

ICLR 2025 · **Progressive Token Length Scaling in Transformer Encoders for Efficient Universal Segmentation**
<u>Abhishek Aich</u>, Yumin Suh, Samuel Schulter, Manmohan Chandraker
The Thirteenth International Conference on Learning Representations, 2025

ICCV-W 2025 · **Mapillary Vistas Validation for Fine-Grained Traffic Signs: A Benchmark Revealing Vision-Language Model Limitations**
Sparsh Garg, <u>Abhishek Aich</u>
IEEE/CVF ICCV Workshop (4th DataCV Workshop and Challenge), 2025

arXiv 2024   **Efficient Transformer Encoders for Mask2Former-style models**
Manyi Yao, <u>Abhishek Aich</u>, Yumin Suh, Amit K. Roy-Chowdhury, Christian R. Shelton, Manmohan Chandraker

arXiv 2024   **Resolving Inconsistent Semantics in Multi-Dataset Image Segmentation**
Qilong Zhangli, Di Liu, <u>Abhishek Aich</u>, Dimitris Metaxas, Samuel Schulter

CVPR-W 2024   **Improving the Efficiency-Accuracy Tradeoff of DETR-Style Models in Practice**
Yumin Suh, Dongwan Kim, <u>Abhishek Aich</u>, Samuel Schulter, Jong-Chyi Su, Bohyung Han, Manmohan Chandraker
IEEE/CVF CVPR Workshop (Efficient Deep Learning for Computer Vision), 2024

ICCV 2023   **Efficient Controllable Multi-Task Architectures**
<u>Abhishek Aich</u>, Samuel Schulter, Amit K. Roy-Chowdhury, Manmohan Chandraker, Yumin Suh
IEEE/CVF International Conference on Computer Vision, 2023

NeurIPS 2022   **GAMA: Generative Adversarial Multi-Object Scene Attacks**
<u>Abhishek Aich</u>*, Calvin-Khang Ta*, Chengyu Song, Srikanth Krishnamurthy, M. Salman Asif, Amit K. Roy-Chowdhury
Advances in Neural Information Processing Systems, 2022

WACV 2023   **Cross-Domain Video Anomaly Detection without Target Domain Adaptation**
<u>Abhishek Aich</u>, Kuan-Chuan Peng, Amit K. Roy-Chowdhury
IEEE/CVF Winter Conference on Applications of Computer Vision, 2023

WACV 2023   **Leveraging Local Patch Differences in Multi-Object Scenes for Generative Adversarial Attacks**
<u>Abhishek Aich</u>, Shasha Li, Chengyu Song, M. Salman Asif, Srikanth Krishnamurthy, Amit K. Roy-Chowdhury
IEEE/CVF Winter Conference on Applications of Computer Vision, 2023

MICCAI 2022   **Poisson2Sparse: Self-Supervised Poisson Denoising From a Single Image**
Calvin-Khang Ta*, <u>Abhishek Aich</u>*, Akash Gupta*, Amit K. Roy-Chowdhury
International Conference on Medical Image Computing and Computer Assisted Intervention, 2022

NeurIPS 2021   **Adversarial Attacks on Black Box Video Classifiers: Leveraging the Power of Geometric Transformations**
Shasha Li*, <u>Abhishek Aich</u>*, Shitong Zhu, M. Salman Asif, Chengyu Song, Amit K. Roy-Chowdhury, Srikanth Krishnamurthy
Advances in Neural Information Processing Systems, 2021

ICCV 2021   **Spatio-Temporal Representation Factorization for Video-based Person Re-Identification**
<u>Abhishek Aich</u>, Meng Zheng, Srikrishna Karanam, Terrence Chen, Amit K. Roy-Chowdhury, Ziyan Wu
IEEE/CVF International Conference on Computer Vision, 2021

CVPR 2020   **Non-Adversarial Video Synthesis with Learned Priors**
<u>Abhishek Aich</u>*, Akash Gupta*, Rameswar Panda, Rakib Hyder, M. Salman Asif, Amit K. Roy-Chowdhury
IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2020

ACMMM 2020 (Oral)   **ALANET: Adaptive Latent Attention Network for Joint Video Deblurring and Interpolation**
Akash Gupta, <u>Abhishek Aich</u>, Amit K. Roy-Chowdhury
ACM International Conference on Multimedia, 2020

ISBI-W 2020	**Deep Quantized Representation for Enhanced Reconstruction**
	Akash Gupta, <u>Abhishek Aich</u>, Kevin Rodriguez, G. Venugopala Reddy, Amit K. Roy-Chowdhury
	IEEE International Symposium on Biomedical Imaging Workshops, 2020

TENCON 2017	**A Novel CS-Beamformer root-MUSIC Algorithm and its Subspace Analysis**
	<u>Abhishek Aich</u>, P. Palanisamy
	IEEE Region 10 Conference, 2017

TENCON 2016 (Oral)	**A Strict Bound for Dimension of Measurement Matrix for CS-Beamformer MUSIC Algorithm**
	<u>Abhishek Aich</u>, P. Palanisamy
	IEEE Region 10 Conference, 2016

ICCSP 2017 (Oral)	**On Application of OMP and CoSaMP Algorithms for DOA Estimation Problem**
	<u>Abhishek Aich</u>, P. Palanisamy
	IEEE International Conference on Communication and Signal Processing, 2017

Patents (*: granted)

| US Patent App. 18/904,571 | **Language-based object detection and data augmentation** |
| | Samuel Schulter, <u>Abhishek Aich</u>, Vijay Kumar |

| US Patent App. 18/968,277 | **Expanding token lengths in transformer encoders** |
| | Samuel Schulter, <u>Abhishek Aich</u>, Yumin Suh, Samuel Schulter |

| US Patent App. 18/918,317 | **Detection of rare and unseen traffic participants and scene elements** |
| | Samuel Schulter, <u>Abhishek Aich</u>, Manmohan Chandraker |

| US Patent App. 18/893,037 | **Efficient transformer-based panoptic segmentation** |
| | <u>Abhishek Aich</u>, Yumin Suh, Samuel Schulter, Manyi Yao |

| US Patent App. 18/659,785 | **Panoptic segmentation with multi-dataset training and part-whole awareness** |
| | Samuel Schulter, <u>Abhishek Aich</u> |

| US Patent App. 18/503,313 | **Single Training Sequence for Neural Network Usable for Multi-task Scenarios** |
| | Yumin Suh, Samuel Schulter, Xiang Yu, <u>Abhishek Aich</u> |

| US Patent 12,315,242* | **Method & System for Zero-Shot Cross Domain Video Anomaly Detection** |
| | <u>Abhishek Aich</u>, Kuan-Chuan Peng |

Honors & Awards

| 2025 | **First Place in U.S. DOT Intersection Safety Challenge.** |
| | ○ Awarded First Place Prize ($750,000) in U.S. Department of Transportation Intersection Safety Challenge 2025 |

| 2025 | **Business Contribution Award, NEC Laboratories America.** |
| | ○ For "Development of Gen AI Autonomy Simulation and DevOps Solutions" |

| 2023 | **Doctoral Consortium Award.** WACV 2023 |

| 2022 | **NeurIPS Scholar Award.** NeurIPS 2022 |

| 2020-2021 | **Student Volunteer Award.** NeurIPS 2020, ICLR 2021, ICML 2021 |

| 2018-2019 | **Deans Distinguished Fellowship Award.** University of California, Riverside |

| 2016-2018 | **MHRD Scholarship.** Govt. of India |

| 2012-2015 | **Scholar's Club.** Silicon Institute of Technology, Bhubaneswar |
| | ○ Top 3 rank holders of the Department of Electrical and Communication Engineering |

| 2012-2015 | **e-Medhabruti Scholarship.** Govt. of Odisha, India |

Press Coverage

VentureBeat	**IBM's AI generates new footage from video stills** *March 2020*
	○ Coverage of our CVPR 2020 paper on Video Generation [article link]

Talks

Feb 2025	**Demystifying Vision Transformers: From Theory to Industry Insights**
	○ Computer Science Colloquium Talk, Sonoma State University, CA, USA
Jan 2023	**Cross-Domain Video Anomaly Detection without Target Domain Adaptation**
	○ Oral Presentation, IEEE WACV 2023
Jan 2023	**Leveraging Local Patch Differences in Multi-Object Scenes for Generative Adversarial Attacks**
	○ Oral Presentation, IEEE WACV 2023

Professional Services

Area Chair	13th International Conference On Data Science (IKDD CODS), 2025
Workshop Organizer	Artificial Intelligence with Biased or Scarce Data (AIBSD), AAAI 2026
	Anomaly Detection with Foundation Models (ADFM), ICCV 2025
	1st Workshop on Scalable and Efficient Artificial Intelligence Systems, AAAI 2025
	1st Workshop on Out-of-Label Hazards in Autonomous Driving, WACV 2025
	1st Workshop on Artificial Intelligence with Biased and Scarce Data, AAAI 2025
	2nd Workshop on Artificial Intelligence with Biased and Scarce Data, AAAI 2024
Journal Reviewer	IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
	IEEE Transactions on Information Forensics and Security (TIFS)
	IEEE Transactions on Image Processing (TIP)
	IEEE Transactions on Signal Processing (TSP)
	IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)
	IEEE Transactions on Services Computing (TSC)
	Elsevier Pattern Recognition (PR)
	Taylor & Francis International Journal of Electronics Letter
	IET Signal Processing
Conference Reviewer	International Conference on Artificial Intelligence and Statistics (AISTATS)
	International Conference on Learning Representations (ICLR)
	Advances in Neural Information Processing Systems (NeurIPS)
	Conference on Computer Vision and Pattern Recognition (CVPR)
	International Conference on Computer Vision (ICCV)
	European Conference on Computer Vision (ECCV)
	Winter Conference on Applications of Computer Vision (WACV)
	Association for the Advancement of Artificial Intelligence (AAAI)
	Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)
Program Committee (Workshops)	CVPR 2022-(TCV, DNetCV)/2021-(HVU, TCV, DNetCV)/2020-(NAS), AAAI 2021-(AIBSD), ECCV 2020-MVA

Mentoring

Manyi Yao (University of California, Riverside)	2023-26
Xu Cao (University of Illinois Urbana-Champaign)	2025