Abhishek Aich

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Research Interests

Computer Vision	Adversarial Attacks, Anomaly Detection, Person Re-Identification
Machine Learning	Neural Architecture Search, Multi-task learning

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Education

2018-2023	**University of California, Riverside,** USA *Ph.D. in Electrical and Computer Engineering* Advisor: Amit K. Roy-Chowdhury Thesis: Towards Reliable Learning Systems: Efficient, Secure and Generalizable Generative Models
2016-2018	**National Institute of Technology, Tiruchirappalli,** India *M.S.(Research) in Electronics and Communication Engineering* Advisor: P. Palanisamy Thesis: Exploiting Sparsity for DOA Estimation Algorithms in Linear Array
2011-2015	**Biju Patnaik University of Technology,** India *B.Tech. in Electronics and Communication Engineering* Advisor: Utpal K. Dash Thesis: Target Tracking using Parametric Spectral Estimation Methods

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Research Experience

Mar 2023-Present	**NEC Laboratories, America,** San Jose, California, USA *Researcher, Media Analytics Group* ○ Focus: Dynamic Networks, Multi-task Learning.
Sept 2018-Mar 2023	**University of California, Riverside,** USA *Graduate Student Researcher, Video Computing Group* ○ Advisor: Amit K. Roy-Chowdhury ○ Focus: Computer Vision, Deep Learning.
June 2022-Sep 2022	**NEC Laboratories, America,** San Jose, California, USA *Research Intern, Media Analytics Group* ○ Mentor: Yumin Suh ○ Focus: Dynamic Networks for Multi-Task Learning.
June 2021-Sep 2021	**Mitsubishi Electric Research Laboratories,** Cambridge, Massachusetts, USA *Research Intern, Computer Vision Group* ○ Mentor: Kuan-Chuan Peng ○ Focus: Video Anomaly Detection.
June 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.

Feb 2016-April 2018	**National Institute of Technology, Tiruchirappalli,** India
	Research Scholar, Signal and Image Processing Lab.
	○ Advisor: P. Palanisamy
	○ Focus: Array Signal Processing, Compressed Sensing.
May 2014-Aug 2015	**Silicon Institute of Technology, Bhubaneswar,** India
	Research Assistant
	○ Advisor: Utpal K. Dash
	○ Focus: Array Signal Processing.

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

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*

Filed Patents

US Patent Application 17-653015	**Method and System for Zero-Shot Cross Domain Video Anomaly Detection** Abhishek Aich, Kuan-Chuan Peng *Date of Application*: March 1, 2022

Teaching Experience

Teaching Assistant	**University of California, Riverside** Supervisor: Amit K. Roy-Chowdhury ○ EE/CS 228 Introduction to Deep learning: Spring 2022 ○ EE 175A/B Senior Design Project (Computer Vision): Fall 2020 - Spring 2021 ○ EE 175A/B Senior Design Project (Computer Vision): Fall 2019 - Spring 2020
Teaching Assistant	**National Institute of Technology, Tiruchirappalli** Supervisor: P. Palanisamy ○ EC 610 Digital Signal and Image Processing Lab.: Jan 2018 - April 2018

Honors & Awards

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: `https://tinyurl.com/yxdxm7m8`

Talks

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

Skills

Languages Python
Libraries PyTorch
Toolbox/Software MATLAB, OpenCV

Professional Services

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)

Elsevier Pattern Recognition (PR)

Taylor & Francis International Journal of Electronics Letter

IET Signal Processing

Conference Reviewer 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