

Abhishek Aich

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in · home

Research Interests

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

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
GPA - 3.84 / 4.00
- 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
GPA - 8.80 / 10.00
- 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
GPA - 9.02 / 10.00

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: Ziyang 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 ([8 Google Scholar profile](#), *: joint first authors)

- NeurIPS 2022 **GAMA: Generative Adversarial Multi-Object Scene Attacks**
Abhishek Aich*, 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**
Abhishek Aich, 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**
Abhishek Aich, 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*, Abhishek Aich*, 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*, Abhishek Aich*, 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**
Abhishek Aich, Meng Zheng, Srikrishna Karanam, Terrence Chen, Amit K. Roy-Chowdhury, Ziyang Wu
IEEE/CVF International Conference on Computer Vision, 2021
- CVPR 2020 **Non-Adversarial Video Synthesis with Learned Priors**
Abhishek Aich*, 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 **ALANET: Adaptive Latent Attention Network for Joint Video Deblurring and Interpolation**
 (Oral) Akash Gupta, Abhishek Aich, Amit K. Roy-Chowdhury
ACM International Conference on Multimedia, 2020

- ISBI-W 2020 **Deep Quantized Representation for Enhanced Reconstruction**
Akash Gupta, Abhishek Aich, 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**
Abhishek Aich, P. Palanisamy
IEEE Region 10 Conference, 2017
- TENCON 2016 **A Strict Bound for Dimension of Measurement Matrix for CS-Beamformer MUSIC Algorithm**
(Oral) Abhishek Aich, P. Palanisamy
IEEE Region 10 Conference, 2016
- ICCSP 2017 **On Application of OMP and CoSaMP Algorithms for DOA Estimation Problem**
(Oral) Abhishek Aich, 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 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