





# Abhishek Aich

WCH 371, University of California Riverside, CA 92521, USA  
aaich001@ucr.edu •  •  •  • 

## RESEARCH INTERESTS

Computer Vision, Deep Learning, and Sparse Signal Optimization

- Specific Interests: Video Reconstruction, Continual Learning, Person Re-identification

## EDUCATION

**University of California**, Riverside, CA, USA

- Ph.D. in Electrical and Computer Engineering
- Adviser: Dr. Amit K. Roy-Chowdhury
- GPA: 3.82 / 4.00

Sep 2018 – Present

**National Institute of Technology**, Tiruchirappalli, Tamil Nadu, India

- M.S. in Electronics and Communication Engineering
- Thesis: Exploiting Sparsity for Direction of Arrival Estimation Algorithms in Linear Array
- Adviser: Dr. P. Palanisamy
- GPA: 8.80 / 10.00

2016 – 2018

**Biju Patnaik University of Technology**, Rourkela, Odisha, India

- B.Tech. in Electronics and Communication Engineering
- Thesis: Target Tracking using Parametric Spectral Estimation Methods
- GPA: 9.02 / 10.00

2011 – 2015

## RESEARCH EXPERIENCE

**Graduate Student Researcher**

Sep 2018 – Present

- University of California, Riverside
- Group: Video Computing Group
- Supervisors: Dr. Amit K. Roy-Chowdhury
- Focus: Computer Vision and Deep Learning.

CA, USA

**Research Scholar**

Feb 2016 – Apr 2018

- National Institute of Technology, Tiruchirappalli
- Group: Signal and Image Processing Lab.
- Supervisor: Dr. P. Palanisamy
- Focus: Array Signal Processing, Compressed Sensing.

Tamil Nadu, India

**Research Assistant**

May 2014 – Aug 2015

- Silicon Institute of Technology, Bhubaneswar
- Supervisor: Prof. Utpal K. Dash
- Focus: Array Signal Processing.

Odisha, India

## TEACHING EXPERIENCE

**Teaching Assistant**

Sep 2019 – Mar 2020

- University of California, Riverside
- Under-Graduate Course: Senior Design Project (Computer Vision) (EE175A/EE175B)
- Supervisor: Dr. Amit K. Roy-Chowdhury

CA, USA

**Teaching Assistant**

Jan 2018 – Apr 2018

- National Institute of Technology, Tiruchirappalli
- Graduate Course: Digital Signal and Image Processing Lab. (EC610)
- Supervisor: Dr. P. Palanisamy

Tamil Nadu, India

## SELECTED PUBLICATIONS

- [1] [Abhishek Aich\\*](#), Akash Gupta\*, Rameswar Panda, Rakib Hyder, Salman Asif, and Amit Roy-Chowdhury, “Non-Adversarial Video Synthesis with Learned Priors,” Accepted in CVPR, 2020. (\* joint first authors)
- [2] Akash Gupta, [Abhishek Aich](#), Kevin Rodriguez, G. Venugopala Reddy, and Amit Roy-Chowdhury, “Deep Quantized Representation for Enhanced Reconstruction,” ISBI 2020 Workshop, 2020. (Poster)
- [3] [Abhishek Aich](#), and P. Palanisamy, “A novel CS beamformer root-MUSIC algorithm and its subspace deviation analysis,” in *IEEE Region 10 Conference (TENCON)*, Penang, Malaysia, pp. 1404-1408, 2017. (Poster)
- [4] [Abhishek Aich](#), and P. Palanisamy, “On application of OMP and CoSaMP algorithms for DOA estimation problem,” in *IEEE International Conference on Communication and Signal Processing (ICCSP)*, Chennai, India, 2017. (Oral)

- [5] Abhishek Aich, and P. Palanisamy, “A strict bound for dimension of measurement matrix for CS beamformer MUSIC algorithm,” in *IEEE Region 10 Conference (TENCON)*, Singapore, pp. 2602-2605, 2016. (Oral)

PROJECTS	<b>Video Generation from Learned Priors</b> <span style="float: right;">Jul 2019 – Nov 2019</span> <ul style="list-style-type: none"> <li>Supervisor: Dr. Amit K. Roy-Chowdhury</li> <li><b>Goal:</b> Generate short video clips without pixel inputs.</li> <li>Designed a generative network to generate the realistic videos using learnable latent vectors, using non-adversarial approach.</li> <li>Introduced a novel triplet condition on the latent vectors to get good latent vector representation of video frames.</li> </ul>
	<b>Multi-View video frame prediction using STAR-GAN</b> <span style="float: right;">Mar 2019 – Jun 2019</span> <ul style="list-style-type: none"> <li>Supervisor: Dr. Amit K. Roy-Chowdhury</li> <li><b>Goal:</b> Predict missing frames in one camera view using other reference camera views.</li> <li>Designed a STAR-GAN based model to predict missing frames in one camera by using view-parallel frames from other reference cameras.</li> <li>Introduced a novel cycle consistency based loss for learning a weighted relationship between missing frame and corresponding reference frames from other cameras.</li> </ul>
	<b>Continual Learning in Person Re-ID systems</b> <span style="float: right;">Jan 2019 – Mar 2019</span> <ul style="list-style-type: none"> <li>Supervisor: Dr. Amit K. Roy-Chowdhury</li> <li><b>Goal:</b> Design a global Person-ReID system to work for different places without forgetting previous data distribution</li> <li>Designed a deep generative network based model to allow a Person Re-ID system to continuously learn different scenarios (in this case, different datasets) without forgetting past person identities in different conditions.</li> </ul>
AWARDS & SCHOLARSHIPS	<b>Deans Distinguished Fellowship Award</b> , University of California, Riverside <span style="float: right;">2018 – 2019</span>
	<b>MHRD Scholarship</b> , Govt. of India <span style="float: right;">2016 – 2018</span>
	<b>Scholar’s Club</b> , Silicon Institute of Technology, Bhubaneswar <span style="float: right;">2012 – 2015</span> <ul style="list-style-type: none"> <li>For being in the Top 3 of the Electrical and Communication Engineering Department</li> </ul>
	<b>e-Medhabruti Scholarship</b> , Govt. of Odisha <span style="float: right;">2012 – 2015</span>
TECHNICAL SKILLS	<ul style="list-style-type: none"> <li><b>Programming Skills:</b> Python, MATLAB</li> <li><b>Deep Learning Libraries:</b> PyTorch</li> <li><b>Scientific Computing Libraries:</b> numpy, scipy, sciKit-learn, matplotlib</li> <li><b>Others:</b> <math>\LaTeX</math>, MS Office, OpenCV, Jupyter</li> </ul>
GRADUATE COURSES	<ul style="list-style-type: none"> <li>Adv. Computer Vision • Machine Learning • Information Theory • Convex Optimization • State and Parameter Estimation Theory • Stochastic Processes • Sparsity, Structure, and Inference • Math. Methods for EE • Adv. Digital Signal Processing</li> </ul>
PROFESSIONAL ACTIVITIES	<b>Conference Reviewer:</b> IEEE TENCON 2016, IEEE TENCON 2017
	<b>Journal Reviewer:</b> IEEE Transactions on Signal Processing, Taylor & Francis International Journal of Electronics Letters, IET Signal Processing