

**Nimisha T M**  
<https://nimiiiit.github.io/>

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Image Processing and Computer Vision Lab  
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<b>EDUCATION</b>	<i>Ph.D</i> , Indian Institute of Technology, Madras Electrical Engineering Department Specialization: Image Processing CGPA: 9.29 Expected completion time: Nov 2018	2013– till date
	<i>M.Tech</i> , National Institute of Technology, Calicut Electronics and Communication Engineering Department Specialization: Signal Processing CGPA: 9.23	2011–2013
	<i>B.Tech</i> , Amrita College of Engineering, Kollam Electronics and Communication Engineering Department CGPA: 9.02	2007–2011

**DISSERTATION** *M.Tech: "An Exploration into Sparse Signal Representation and Recovery"*  
*Under Guidance of Dr. G. Abhilash, NIT Calicut.*

**RESEARCH  
TOPICS**

**Cross Camera Mapping**

The photometric properties of a scene changes with varying camera and illumination producing variation in the observed images. We come up with a camera-invariant representation of images for the purpose of change detection and panorama.

**Underwater Color Restoration**

Light attenuates as it propagates in deep water resulting in blue ting, color-cast and hazy appearance of underwater images. We propose a method to color correct these images and produce its equivalent as seen from outside the water column.

**Dictionary Replacement for 3D reconstruction**

The central idea of sparse representations is that all natural signals can be represented sparsely in an over-complete dictionary. We use this idea to estimate the latent image and depth map from a space variantly blurred image.

**From Video to Pan Shots**

Pan photography is an artistic shot to capture motion in images. But capturing such images require great amount of skill and effort. We ease this by synthesizing the same from a captured video.

**Image Deblurring**

Images captured with long exposure time result in motion blur artifacts. Restoring such images is highly ill-posed and several priors have been introduced to regularize the optimization. We propose a learning-based approach using the concept of blur-invariant features that are extracted with deep auto-encoders to assist in deblurring.

**Unsupervised Deblurring**

Existing deblurring frameworks require close supervision in the form of large paired dataset for training. Collecting such dataset is tedious and time consuming. Hence we propose an unsupervised technique with no pairing to learn the blur inversion.

## **PUBLICATIONS**

1. T M Nimisha, Sunil Kumar, and A N Rajagopalan, "Unsupervised Class-Specific Deblurring", accepted for publication in European Conference on Computer Vision (ECCV) 2018.
2. Nimisha T M, A N Rajagopalan, and R Aravind, "Generating High Quality Pan-Shots from Motion Blurred Videos," Accepted for publication in Computer Vision and Image Understanding (CVIU) Journal 2018.
3. T. M. Nimisha, Vijay Rengarajan, and A. N. Rajagopalan, "Semi-supervised Learning of Camera Motion from a Blurred Image," Accepted for publication at IEEE International Conference on Image Processing (ICIP), Athens, Greece, October 2018.
4. Punnappurath, Abhijith, Thekke Madam Nimisha, and Ambasamudram Narayanan Rajagopalan. "Multi-Image Blind Super-Resolution of 3D Scenes." IEEE Transactions on Image Processing 26.11 (2017): 5337-5352.
5. T.M Nimisha, Akash kumar S and A.N.Rajagopalan, "Blur-Invariant Deep Learning for Blind Deblurring" in International Conference on Computer Vision (ICCV), Venice, Italy 2017.
6. T.M Nimisha, M. Arun, and A.N. Rajagopalan, "Dictionary Replacement for Single Image Restoration of 3D Scenes, in British Machine Vision Conference (BMVC), York, UK. September 2016.
7. T M Nimisha, Karthik Seemakurthy, A N Rajagopalan, Narayanaswamy Vedachalam and Ramesh Raju, "Color Restoration in Turbid Medium", In Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2016.
8. Nimisha T.M., A.N. Rajagopalan, and R. Aravind. "Seamless Change Detection and Mosaicing for Aerial Imagery." In CVPR workshop on The Computer Vision in Vehicle Technology (CVVT) 2015.

## **PROFESSIONAL/ ACADEMIC ACHIEVEMENTS**

- My team (IPCV-team) bagged first, second and third place in track A, B and C, respectively of the PIRM Challenge (Perceptual Image Restoration and Manipulation) conducted by ECCV 2018.
- Patent on "SYSTEM AND METHOD FOR GENERATING PAN SHOTS FROM VIDEOS" under process
- Recipient of Institute Research (IR) Award for Even-Semester 2018
- Reviewer for NCC 2017, WACV 2018 and SPCOM 2018
- Assisted my Professor in reviewing for ICVGIP 2016, NCVPRIPG 2015, ICAPR 2014 and IETE Journal
- Won first prize in "Code to Optimize" event conducted in the technical event Shaastra 2016, IIT Madras
- Received travel grant from Microsoft and ACM India to present my work in ICCV 2017

**TEACHING  
EXPERIENCE**

I have worked as a teaching assistant for the following courses

- EE6132: Deep learning for image processing July-Nov 2017
- EE5175: Image signal processing Jan-June 2017/2016
- EE1100: Basic electrical engineering July-Nov 2016
- EE5130: Digital signal processing July-Nov 2015

**RELEVANT  
COURSES**

Digital Signal Processing  
Digital Video Processing  
Probability Theory

Image Signal Processing  
Linear Algebra  
Detection and Estimation Theory

**WORKSHOP  
ATTENDED**

- The Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2016/2014.
- Summer School on Deep Learning 2016 conducted by IIIT Hyderabad.
- International Conference on Computer Vision (ICCV) 2017.

**SKILLS**

MATLAB, Torch, Python and C (basics)

**REFERENCES**

Prof. A N Rajagopalan  
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<http://www.ee.iitm.ac.in/ipcvlab/>

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