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CONTACT INFORMATION	ESB 221 Computational Imaging Lab, IIT Madras	<i>E-mail:</i> ee15s055@ee.iitm.ac.in <i>web:</i> anil@ImagingLab
RESEARCH INTERESTS	Computational Photography, Compressive Imaging, Computer Vision, Deep Learning and Image Generative Models	
EDUCATION	<b>M.S. by research</b> , Electrical Engineering (Aug 2015 - Present) Guide: Dr. Kaushik Mitra Indian Institute of Technologies, Madras <i>cgpa:</i> 7.85/10  <b>B.Tech</b> , Electronics & Communications Engineering (Jun 2011 - May 2015) Rajiv Gandhi University of Knowledge Technologies (RGUKT), Basar, India <i>cgpa:</i> 8.69/10  <b>Pre University Course</b> (Oct 2009 - Apr 2011) Rajiv Gandhi University of Knowledge Technologies (RGUKT), Basar, India <i>cgpa:</i> 9.83/10	
RELEVANT COURSES	Intro. to Machine learning, Theory of Probability, Computational Photography, Convex Optimization, Advanced Linear Algebra	
SCHOLASTIC ACHIEVEMENTS	<ul style="list-style-type: none"><li>• Our QInF 2016 gets renewed to QInF 2017 with an additional <b>million</b> INR funding.</li><li>• Thesis proposal was awarded <i>Qualcomm Innovation Fellowship 2016, India (QInF)</i> with <b>one million</b> INR funding.</li><li>• Received IEEE SPS Travel Grant award for ICIP 2017</li><li>• Granted MHRD, India scholarship for masters at IITM (Jul 2015 to Feb 2018)</li><li>• Selected for Summer Fellowship 2014 of Indian Academy of Sciences</li><li>• Awarded state govt.'s postmatric scholarship for PUC and undergraduation at RGUKT, Basar</li></ul>	
JOURNALS	Akshat Dave, <b>Anil Kumar Vadathya</b> , Ramana Subramanyam, Rahul Baburaj, Kaushik Mitra. "Solving Inverse Computational Imaging Problems using Deep Pixel-level Prior." <i>arXiv preprint arXiv:1802.09850 (2018)</i> . (Under review at IEEE Transactions of Computational Imaging (TCI))  <b>Anil Kumar Vadathya</b> , Sharath Girish, Kaushik Mitra. "A Deep Learning Framework for Light Field Reconstruction from Minimal Measurements." (To be Submitted)	
CONFERENCE PUBLICATIONS	<b>Anil Kumar Vadathya</b> , Sai Kiran Cholleti, Gautham Ramajayam, Vijalakshmi K and Kaushik Mitra. "Learning Light Field Reconstruction from a Single Coded Image." <i>Asian Conference on Pattern Recognition, 2017</i> .  Akshat Dave, <b>Anil Kumar Vadathya</b> , and Kaushik Mitra. "Compressive Image Recovery Using Recurrent Generative Model." <i>IEEE International Conference on Image Processing, 2017</i> .	

Sowmya Ch, Anjumara Shaik, Chakravarthi Jada, **Anil Kumar Vadathya**. “Butterfly Communication Strategies: A Prospect for Soft-Computing Techniques.” *Proc. of IEEE International Joint Conference on Neural Networks (IJCNN)*, 2014.

Harish Y, Kranthi Kumar R, Irfan Feroz G MD, Chakravarthi Jada, **Anil Kumar Vadathya**, Mounika Mesa. “ROBOG: Robo-Guide with simple learning strategy.” *Proc. of IEEE Students Technology Symposium*, India, 2014.

Chakravarthi Jada, **Anil Kumar Vadathya**, Anjumara Shaik, Sowmya Charugundla, Parabhaker Reddy Ravula, and Kranthi Kumar Rachavarapu. “Butterfly Mating Optimization.” *In Intelligent Systems Technologies and Applications*, Springer International Publishing, 2015.

Kranthi Kumar R, Irfan Feroz G MD, Chakravarthi Jada, Harish Y, **Anil Kumar Vadathya**. “ROBOG An Autonomously Navigating Outdoor Robo-Guide.” In *Swarm, Evolutionary, and Memetic Computing*, Springer International Publishing, 2014.

## PROJECTS

### **Learning Depth from Defocus (DfD) using View Supervision**

with Sarath Girish and Dr. Kaushik Mitra, EE dept., IIT Madras (Jan 18 - Present)

- We exploit learning based techniques for DfD using light fields

### **Lightfield Reconstruction from Focus-Defocus Pairs using CNNs**

with Dr. Kaushik Mitra, EE dept., IIT Madras (Oct 17 - Present)

- We learn to estimate disparity from focus-defocus pair via view-supervision using deep neural networks. The disparity map is used to synthesize light field.

### **Denoising High Density Expressions in Mouse Brain Imaging**

with Mayug, Dr. Kaushik Mitra at IITM and Kannan UV, Pavel Osten at CSHL, NY (Dec 17 - Present)

- We leverage deep neural networks for noise removal in mouse brain images to improve registration accuracy.

### **Compressive Lightfield Recovery using Deep Neural Nets**

with Sai Kiran and Dr. Kaushik Mitra, EE dept., IIT Madras (Feb 17 - Jul 17)

- Part of proposal for QInF 2016
- CNNs are used to tackle the spatio-angular resolution trade-off in Lightfield imaging.

### **Recurrent Generative Priors for Computational Photography**

with Akshat Dave and Dr. Kaushik Mitra, EE dept., IIT Madras (Jun 16 - Present)

- Part of proposal for QInF 2016
- Data driven priors for compressive imaging reconstruction
  - Single Pixel Camera (SPC) and Line Sensor (LiSens)
  - 3 dB improvement on avg. over traditional methods like TVAL3 and D-AMP

### **Adaptive Mixture of Conditional GSMs for Image Denoising**

with Sarath and Dr. Kaushik Mitra, EE dept., IIT Madras (Jan 17 - May 17)

- Conditional mixture model is adapted based on noisy image observation to improve denoising. Conditional modeling removes patch limitation with normal GMMs.

**Compressive Lightfield Recovery using Convolutional Sparse Coding (CSC)**  
*with Susmitha and Dr. Kaushik Mitra, EE dept., IIT Madras (Jan 17 - May 17)*

- CSC, a convolutional extension of dictionary learning is adopted for compressive light field recovery

**Face Quality Assessment for Face Recognition in The Surveillance Scenario**  
*Intern with Dr. Sumohana, Dept. of EE, IIT Hyderabad (Jun 14 - Jul 14)*

- Here we used Gaussian Binary Restricted Boltzmann Machine (RBM) for modeling the distribution of facial features. We then used this model to perceptually assess the face image for face recognition i.e whether a face is recognizable in the given image.
- Submitted a technical report to EE dept., IIT Hyderabad.

**Butterfly Communication strategies:** *(Jan 14 - Mar 15)*  
**A prospect for Multimodal Optimization**  
*with Sowmya, Anjum and Chakravarthi Jada, ECE dept., RGUKT Basar*

- In this work, we have developed a multi-modal optimization algorithm inspired from the communication strategies deployed by butterflies.
- We evaluated it on benchmark functions along with practical applications like unsupervised clustering of satellite images.
- This work was presented at IJCNN 2014 and ISTA 2015.

**RoboG: Robo Guide based on simple learning strategy** *(Aug 13 - Feb 14)*  
*with Kranthi, Irfan, Harish and Chakravarthi Jada, ECE dept., RGUKT Basar*

- Here, we developed a guiding robot for our university(RGUKT). We formulated the navigation as a regression problem and solved it with neural networks.
- For external navigation we developed a novel image processing pipeline and tested it successfully in our campus.
- This work was presented at IEEE TechSym 2014 and SEMCCO 2015.

TALKS & POSTERS

- Poster on “A Deep Learning Framework for Light Field Reconstruction from Minimal Measurements” at ICCP 2018, CMU, Pittsburgh.
- Talk on “Compressive Lightfield Reconstruction using Deep Neural Nets”, at Qualcomm Bangalore, May 2017.
- Poster on “Compressive Image Recovery using Recurrent Generative Model” at ICCP 2017, Stanford.
- Poster on “Learning Light Field Reconstruction from a Single Coded Image” at ACPR 2017, Nanjing, China.
- Talk on “Single Pixel Camera(SPC) Reconstruction using Recurrent Generative Model”, at Qualcomm Bangalore, Feb 2016.
- Presented “Deep Generative Networks For Image Processing”, at workshop by Interdisciplinary Lab on Data Sciences (ILDS), IIT Madras, 2016.

WORKSHOPS &  
SUMMER SHCOOLS

- Attended summer school on “Deep Learning for Computer Vision”, summer school at IIIT Hyderabad, June 2016.
- Attending Summer School on “Computer Vision: Recent Advances in Computer Vision”, IIIT Hyderabad, July 2017.

TEACHING  
EXPERIENCE

- Teaching assistance for Deep Learning for Image Processing (Fall 2017)
- Teaching assistance for Machine Learning for Computer Vision (Spring 2017)  
*Setting up programming assignments and term papers*
- Teaching assistance for Computational Photography (Fall 2017)  
*Setting up and evaluation of course projects; Setting up term papers*
- Teaching assistance for Machine Learning for Computer Vision (Spring 2016)  
*Setting up programming assignments and term papers*

SKILLS

Programming Languages : C, Python  
Packages : Tensorflow, Caffe, MATLAB, OpenCV  
Applications : L<sup>A</sup>T<sub>E</sub>X, MS Office  
Operating Systems : Linux, Windows