

SAKET ANAND

Asst. Professor

A-510, Academic Block, IIIT-Delhi, Okhla Phase-III, New Delhi, India

Email: anands@iiitd.ac.in Tel: +91-11-2690 7425

RESEARCH INTERESTS

Computer Vision

Robust statistical methods. Geometric computer vision.

Machine Learning

Deep learning. Semi-supervised learning. Riemannian optimization.

Application Areas

Wildlife Conservation. Road Safety and Autonomous Vehicles. Speech Processing.

RESEARCH EXPERIENCE

Assistant Professor, IIIT-Delhi

Sept. 2013-Present

- Visual Identification of Species and Individuals.
- Disentangling factors of variation in visual and speech data.
- Robust statistical estimation in computer vision.
- Riemannian optimization for small-sample learning.

Summer Fellow, Center for AI in Society, USC

Jun. 2018-Jul. 2018

Host: [Prof. Milind Tambe](#)

- SPOT: Automatic detection of poachers and animals in aerial Thermal IR videos.

Graduate Assistant, RIUL, Rutgers University

Jan. 2010-Jun. 2013

Adviser: [Prof. Peter Meer](#)

- Semi-supervised methods for kernel mean-shift clustering.
- Robust regression using generalized projection based M-estimator.

Research Intern, Siemens Corporate Research, Princeton

Jun. 2011–Jun 2013

Supervisor: Dr. Maneesh Singh

- Geometric modeling of indoor scenes from a single RGB-D image.

Research Engineer, Read-Ink Technologies, Bangalore, India

Oct. 2007–Dec. 2009

Supervisor: Prof. Thomas O. Binford

- Lexical correction for recognition of handwritten characters of the English alphabet.
- Design of empirical probability density functions for classification of handwritten characters.

Graduate Assistant, DIMACS, Rutgers University

Sep. 2005–Jun. 2006

Adviser: Prof. Richard Mammone, Prof. Fred Roberts

- Sequential decision making algorithms for Port of Entry inspection procedures.
- Facial recognition using kernel methods.

FUNDED PROJECTS

IIIT-Delhi

- Machine Learning on Constrained Devices (May 2018-Jul. 2018)
Unrestricted grant from Microsoft Research, India
Amount: INR 1.5L (role: PI, status: received)
- Species Classification in Camera Trap Images (2017-2019)
RA Support from WII, Dehradun
Amount: INR 6L (role: PI, status: received)
- Statistical Machine Learning using Deep Neural Architectures (2018-2019)
Unrestricted grant from Verisk Analytics
Amount: INR 6.5L (role: PI, status: received)

- Smart Driving Using Cooperative Perception Over a Constrained Communications Network (2018-2021)
Interdisciplinary Cyber-Physical Systems, Dept. of Science and Technology
Amount: INR 97L (role: Co-PI, status: approved)
- Swarath - Autonomous Last Mile Connectivity for Indian Roads (2016-2019)
Support from IIIT-Delhi for Mahindra Rise Prize - Driverless Car Challenge (National level)
Amount: INR 25L (role: Co-PI, status: received)

TEACHING

Goethe University, Frankfurt am Main, Germany
(Invited Lecturer - 01/12/2016 - 31/12/2016)

- Robust Methods for Geometric Computer Vision
Traditional methods, sampling based, graph based and globally optimal methods.

IIIT-Delhi Sept. 2013-Present

- Deep Learning (Winter 2017, 2018)
- Machine Learning (Monsoon 2016, 2017, 2018)
- Computer Vision (Winter 2014, 2015, 2016, 2017, 2018)
- Linear Optimization (Monsoon 2014, 2015)
- Statistical Signal Processing (Winter 2015, 2016, 2017)

EDUCATION

Rutgers University, NJ, USA, Ph.D., ECE, Jun. 2013
Adviser: [Prof. Peter Meer](#)
Robust Methods for Multiple Model Discovery in Structured and Unstructured Data.

Rutgers University, NJ, USA, M.S., ECE, Oct. 2006
Adviser: Prof. Richard Mammone
Comparison of Current Face Recognition Techniques.

Pune University, Pune, India, B.E., Electronics Engineering, Jul. 2003

REFEREED PUBLICATIONS

Book Chapters

- **S. Anand**, S. Mittal and P. Meer, *Robust Estimation for Computer Vision using Grassmann Manifolds*, Riemannian Computing in Computer Vision, Co-editors: P.K. Turaga and A. Srivastava, Springer, Chapter 6, 2016.

Journal Papers

- **S. Anand**, S. Mittal, O. Tuzel and P. Meer, *Semi-Supervised Kernel Mean Shift Clustering*, IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI), vol. 36, pp. 1201-1215, Jun. 2014 (impact factor 4.9)
- S. Mittal, **S. Anand** and P. Meer, *Generalized Projection Based M-Estimator*, IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI), vol. 34, pp. 2351-2364, Dec. 2012 (impact factor 4.9)

Conference Papers

- A. H. Jha, **S. Anand**, M. Singh and V. S. R. Veeravasarapu, *Disentangling Factors of Variation with Cycle-Consistent Variational AutoEncoders*, ECCV, 2018, accepted.
- M. K. Pal, R. Bhati, S. K. Kaul, **S. Anand** and P. B. Sujit *A Reinforcement Learning Approach to Jointly Adapt Vehicular Communications and Planning for Optimized Driving*, ITSC, 2018, accepted.
- L. Tiwari and **S. Anand**, *DGSAC: Density Guided SAMpling and Consensus*, IEEE Winter Conference on Applications of Computer Vision (WACV) 2018, 974-982, (acceptance rate 37%).

- A. Tripathi, A. Mohan, **S. Anand** and M. Singh, *Adversarial Learning of Raw Speech Features for Domain Invariant Speech Recognition*, ICASSP 2018, accepted.
- G. S. Cheema and **S. Anand**, *Automatic Detection and Recognition of Individuals in Patterned Species*, accepted, European Conference on Machine Learning /Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD), 2017, (acceptance rate 29%).
- A. Jain, A. Fell and **S. Anand**, *Parallel Architecture for High Frame Rate Stereo using Semi-Global Matching*, accepted, British Machine Vision Conference (BMVC) 2017, (acceptance rate 30%).
- L. Tiwari, **S. Anand** and S. Mittal, *Robust Multi-Model Fitting using Density and Preference Analysis*, Asian Conference on Computer Vision (ACCV) 308-323, (acceptance rate 25%).
- A. Shukla and **S. Anand**, *Metric Learning Based Automatic Segmentation of Patterned Species*. IEEE International Conference on Image Processing (ICIP), 2016, 3982-3986 (acceptance rate 45%).
- L. Tiwari and **S. Anand**, *Fast Hypothesis Filtering For Multi-Structure Geometric Model Fitting*. IEEE International Conference on Image Processing (ICIP), 2016, 3728-3732 (acceptance rate 45%).
- S. Mittal, **S. Anand** and P. Meer, *Generalized Projection based M-Estimator: Theory and Applications*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2011, 2689-2696 (acceptance rate 22.5%).
- **S. Anand**, D. Madigan, R. Mammone, S. Pathak and F. Roberts, *Experimental Analysis of Sequential Decision Making Algorithms for Port of Entry Inspection Procedures*, in S. Mehrotra, et al (eds.), Proceedings of Intelligence and Security Informatics, LNCS 3975, Springer-Verlag, New York, 2006 (acceptance rate 31%).

Technical Reports and Workshop Papers

- A. Shukla, G. S. Cheema and **S. Anand** *ClusterNet : Semi-Supervised Clustering using Neural Networks*, ArXiv, Jun 2018.
- D. Kimothi, A. Shukla, P. Biyani, **S. Anand** and J. Hogan, *Metric Learning on Biological Sequence Embeddings*, accepted, SPAWC 2017.
- A. Shukla and **S. Anand**, *Distance Metric Learning by Optimization on the Stiefel Manifold*, In H. Drira, S. Kurtek, and P. Turaga, editors, Proc. of the 1st Int. Workshop on DIFF-CV 2015, pages 7.1-7.10. BMVA Press, September 2015 (**Best Student Paper**).
- **S. Anand**, M. Singh, V. Singh and S. Kluckner, *Heteroscedastic 3D Superpixel Segmentation Using Noise Characterization of 3D Sensors*, Invention Disclosure, Siemens Corporation, 2012.
- M. Singh, V. Singh **S. Anand** and S. Kluckner, *Fast Statistical Approach for Semantic 3D Modeling of Indoor Scenes from Point Cloud Data*, Invention Disclosure, Siemens Corporation, 2012.
- **S. Anand**, D. Madigan, R. Mammone, S. Pathak and F. Roberts, *Experimental Analysis of Sequential Decision Making Algorithms for Port of Entry Inspection Procedures*, DIMACS TR:2006-05.
- C. Podilchuk , A. Patel, A. Harthattu, **S. Anand** and R. Mammone, *A New Face Recognition Algorithm based on Bijective Mappings*, IEEE Workshop on FRGC Experiments, CVPR 2005.

PROFESSIONAL ACTIVITIES

- Organizer, First Workshop on Visual Wildlife Monitoring, co-located with ICCV 2017.
- Reviewer for IEEE Transactions on Image Processing, IEEE Transactions on Knowledge and Data Engineering, IEEE Signal Processing Letters, Elsevier Pattern Recognition, Elsevier Information Fusion and Elsevier Robotics and Autonomous Systems.
- Member, Program Committee, DIFF-CVML, Workshop in conjunction with CVPR 2016, 2018.
- Member, Technical Committee, ICPR 2016, 2018.
- Member, IEEE.