

RESEARCH INTEREST	Research interests lie primarily on machine learning, computer vision, 3D multiple-view geometry and on their applications. Designing machine learning algorithms for scalable computer vision problems is a primary objective.	
EDUCATION	Indian Statistical Institute, India PhD in Computer Science	2009 - 2013 Advisor: Prof. Bhabatosh Chanda
	Indian Statistical Institute, India Master of Technology in Computer Science	2007 - 2009
	University of Calcutta, Kolkata, India Master of Science in Applied Mathematics	2005 - 2007
	University of Calcutta, Kolkata, India Bachelor of Science in Mathematics	2002 - 2005 Graduated with Honors
EMPLOYMENT	Visiting Scientist, India School of Computer Science The University of Adelaide, Adelaide, Australia	Visiting Scientist February 2016 - March 2016
	Post-doctoral Researcher, Australia School of Computer Science The University of Adelaide, Adelaide, Australia	Research Associate September 2013 - February 2016
TEACHING INVITED TALKS	ISI Kolkata, Westbengal, India – <i>Global Solutions for Maximum Consensus Problems.</i> Leibniz University Hannover, Germany – <i>Hypergraph-based Clustering Methods.</i> University of Adelaide, Australia – <i>On-line/Off-line Motion Segmentation.</i> NIT Agartala, Tripura, India – <i>Machine Learning for Computer Vision.</i> Tezpur University, Assam, India – <i>Mathematical Morphology in Image Processing</i> Manipur University, Imphal, India – <i>Advanced Face Recognition</i> RGU Tawang, Arunachal Pradesh, India – <i>Off-line handwritten character recognition</i>	17 March. 2015 21 sept. 2014 13 July. 2014 23-27 March. 2011 14 Dec. - 22 Jan. 2010 10-12 Nov. 2010 10-12 Sep. 2009
ACADEMIC SERVICE	Reviewer on Selected Recent Conferences/Journals CVPR '14, ACCV '14 '12, ICVGIP '14, '12, NCVPRIPG '13, ICIP '14, ICPR '14, ICAPR '15 IEEE TIP, IEEE SPL, IEEE CSVT, IEEE TFS, IEEE T. Cybernetics, Optical Engineering, SPIE Springer, IET CV, IET IPR Program Committee Member NCVPRIPG 2013, ICAPR 2015, ICVGIP 2012, ICVGIP 2014 System Administrator of VLRG group ISI Kolkata, India.	
TECHNICAL SKILLS	<ul style="list-style-type: none">• Languages: C/C++, Java, and Python• Computing: Matlab, Octave and R	

- **Platforms:** Linux, and Windows
- **Writing:** LATEX and Microsoft Office

AWARD FELLOWSHIP

- INSPIRE Faculty Award, Department of Science and Technology, Govt. of India, 2015 – 2020
- CVPR 2015: Best Paper Honorable Mention Award.
- Gold medal from the Vivekananda College, India for securing highest marks in Mathematics Hons. (BSc.).
- Research Fellowship from ISI Kolkata, India.

RESEARCH PROJECTS

- **3D Multi-view Geometry:** Develop/Optimize some algorithms for building blocks of 3D multi-view geometry problem[C1][C2].
- **Super Resolution:** Generating high resolution image from single or multiple low resolution ones incorporating different image priors [J1][J2] and by learning natural image patch prior [C3][C5][J3].
- **Deblurring and other Inverse problems:** Develop regularization techniques to solve classical inverse problems in image processing (e.g. image deblurring) based on efficient priors [C4][C7].
- **Painting Restoration:** Digital recovery and restoration of wall paintings from damaged and degraded ones [C6].
- **Dance Classification:** Build a classification module to categorize Indian classical dance by learning dance pose bases [C8].
- **Sketch-Photo Synthesis and Recognition:** Synthesizing realistic photograph from sketch images by learning sketch-photo patch prior and then use this for person identification [C9][C10].
- **Morphological Features:** Develop morphological directional feature for digit recognition and writer identification systems [C11][C12].
- **Video Completion:** Removal of unwanted objects from a video and fill the hole by the known portion in a clever way [C13].

PUBLICATIONS

Journal Publications:

- J1. Purkait, P., Chanda, B., Super resolution image reconstruction through bregman iteration using morphologic regularization, *Image Processing, IEEE Transactions on (TIP)*, 21 (9), 4029–4039, 2012, IEEE.
- J2. Purkait, P., Chanda, B., Morphologic gain controlled regularization for edge-preserving super-resolution image reconstruction, *Signal, Image and Video Processing (SIVP)*, 7 (5), 925–938, 2013, Springer.
- J3. Purkait, P., Pal, N.R., Chanda, B., A Fuzzy-Rule Based Approach for Single Frame Super Resolution., *Image Processing, IEEE Transactions on (TIP)*, 23 (5), 2277–2290, 2014, IEEE.

Conference Publications:

- C1. Chin, T.J., Purkait, P., Eriksson, A., and Suter, D., Efficient Globally Optimal Consensus Maximisation with Tree Search, *In Proceedings of the 28th IEEE Conference on Computer Vision and Pattern Recognition (CVPR '15)*, Boston, MA, USA, June 7-12, 2015 (**Oral**), **CVPR15: Best Paper Honorable Mention**.
- C2. Purkait, P., and Chin, T.J., Ackermann, H., and Suter, D., Clustering with hypergraphs: The case for large hyperedges, *In Proceedings of the 13th European Conference on Computer Vision (ECCV '14)*, Zurich, Switzerland, September 6-12, 2014
- C3. Purkait, P., Chanda, B., Fuzzy-Rule Based Approach for Single Frame Super Resolution., *In Proceedings of the IEEE International Conference on Fuzzy Systems (Fuzz-IEEE '13)*, Hyderabad, India, July 2013. (**Oral**)
- C4. Purkait, P., Chanda, B., Adaptive Morphologic Regularizations for inverse problems, *In Proceedings of the 11th International Symposium on Mathematical Morphology (ISMM '13)*, Uppsala, Sweden, May 2013. (**Oral**)

- C5. Purkait, P., Chanda, B., Image upscaling using multiple dictionaries of natural image patches, *In Proceedings of the 11th Asian Conference on Computer Vision (ACCV '12)*, Daejeon, South Korea, November 2012.
- C6. Purkait, P., Chanda, B., Digital restoration of damaged mural images, *In Proceedings of the 8th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP '12)*, Mumbai, India, December 2012. **(Oral)**
- C7. Purkait, P., Chanda, B., A Fast and Robust Deblurring Technique on High noise Environment., *In Proceedings of the IEEE international conference on image processing (ICIP '13)* Melbourne Australia, September 2013.
- C8. Samanta, S., Purkait, P., Chanda, B., Indian Classical Dance Classification by Learning Dance Pose Bases, *In Proceedings of IEEE Workshop on Applications of Computer Vision (WACV '12)*, Breckenridge, CO, USA, January 2012. **(Oral)**
- C9. Atal, K., Arora, A., Purkait, P., Chanda, B., Face Image Retrieval Based on Probe Sketch Using SIFT Feature Descriptors, *In Proceedings of Perception and Machine Intelligence (PerMin '12)*, Kolkata, India, January 2012.
- C10. Purkait, P., Chanda, B., Kulkarni, S., A Novel Technique for Sketch to Photo Synthesis, *In Proceedings of the 7th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP '10)*, Chennai, India, December 2010. **(Oral)**
- C11. Purkait, P., Chanda, B., Off-line Recognition of Hand-written Bengali Numerals Using Morphological Features, *In Proceedings of the 12th International Conference on Frontiers in Handwriting Recognition (ICFHR '10)*, Kolkata, India, November 2010.
- C12. Purkait, P., Kumar, R., Chanda, B., Writer Identification for Telegu Documents Using Directional Morphological Features, *In Proceedings of the 12th International Conference on Frontiers in Handwriting Recognition (ICFHR '10)*, Kolkata, India, November 2010.
- C13. Ghorai, M., Purkait, P., Chanda, B., A fast Box-based Video Inpainting Techniques., *In Proceedings of the 5th International Conference on Pattern Recognition and Machine Intelligence, (PREMI '13)* Kolkata, September 2013.

Submitted Articles:

- S1. Purkait, P., Chin, T.J., Suter, D., Clustering with Hypergraphs: The Case for Large Hyperedges, *TPAMI*, August 2015.
- S2. Chin, T.J., Purkait, P., Eriksson, A., and Suter, D., Efficient Globally Optimal Consensus Maximisation with Tree Search, *On Preparation, Invited paper for TPAMI*

CONTACT INFORMATION

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REFERENCES

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