CURRICULUM VITAE

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Research Activities:

- Working in a team of six members, at CVPR Unit. I take active part in designing a model based recognition system for Bangla online handwriting. An online handwriting consists of a set of points in two dimensions. These points are pre-processed to discard irrelevant and redundant information. From the pre-processed points, higher dimensional features are computed. We design statistical models to describe the distribution of the features. Along with, we apply Hidden Markov Model for classification. My implementations are with C on windows.

- My current research focuses on statistical mixture models to solve clustering problems in various domains. I concentrate on designing heterogeneous mixture models, where each mixture component can be designed runtime with respect to the data in hand. My second research aspect is statistical models for directional data. Such data have angular characteristics and may arise from many real life situations. My application fields are color image segmentation and online handwriting recognition. I use C and Matlab for implementations.

- During my establishment at ECSU, ISI, I worked in a team of four members and took active part in designing an advisory system to control and enhance the performance of welding process. The advisory system was built on the basis of neural models for the welding system. This system provided an environment to the welder, in order to select welding parameters based on output requirements. My implementation works were with C on Unix platform and Matlab on Windows.

- Worked with off-line handwritten Bangla document analysis and submitted my dissertation entitled "Skew Detection and Character Segmentation for Handwritten Bangla Words" at M. Sc. level. During this dissertation project I constructed an efficient algorithm for extracting characters from Bangla words. I continued this study further with two doctoral candidates. We proposed a hierarchical recognition framework based on neural models. Our study concluded that Support Vector Machine (SVM) based framework better recognizes Bangla characters than the other neural models.

Publications:

Journal Papers:

1. **Anandarup Roy** and Swapan K. Parui, *Pair Copula Based Mixture Models and their Application in Clustering*, Pattern Recognition, Elsevier, **IF: 2.632 (2012)**, *To appear.*

2. **Anandarup Roy**, Swapan K. Parui and Utpal Roy, *A Mixture Model of Circular-Linear Distributions for Color Image Segmentation*, International Journal of Computer Applications, Foundation of Computer Science, Vol. 58(9), pp. 6-11, 2012.

3. Ranjit Ghoshal, **Anandarup Roy** and Swapan Kumar Parui, *Recognition of Bangla Text from Outdoor Images using Decision Tree Model*, Submitted, 2012.

4. Tapan Kumar Bhowmik, Pradip Ghanty, **Anandarup Roy** and Swapan Kumar Parui, *SVM-Based Hierarchical Architectures for Handwritten Bangla Character Recognition*, International Journal of Document Analysis and Recognition (IJDAR), **IF: 1.213 (2009)**, springer, Vol. 12, pp. 83- 96, 2009.

5. P. Ghanty, S. Paul, **A. Roy**, D. P. Mukherjee, N. R. Pal, M. Vasudevan, H. Kumar and A.K. Bhaduri, *A Fuzzy Rule Based Approach for Predicting Weld Bead Geometry in Gas Tungsten Arc Welding*, Science and Technology of Welding and Joining (STWJ), **IF: 1.327 (2009)**, Vol. 13(2), pp. 167- 175, 2008.

Conference Proceedings:

1. Ranjit Ghoshal, **Anandarup Roy** and Swapan K. Parui, *A Copula Based Statistical Model for Text Extraction from Scene Images*, Accepted in Int. Conf. on Pattern Recognition and Machine Intelligence (PreMI), Springer-Verlag, 2013.

2. **Anandarup Roy**, Swapan K. Parui and Utpal Roy, *A Pair-copula Based Scheme for Text Extraction from Digital Images*, Proc. of Int. Conf. on Document Analysis and Recognition (ICDAR), pp. 892-896, IEEE CS press, August 2013, Washington, DC.

3. **Anandarup Roy**, Swapan Kumar Parui and Utpal Roy, *A Finite Mixture Model Based on Pair-Copula Construction of Multivariate Distributions and its Application to Color Image Segmentation*, Proc. of the Indian Conf. on Computer Vision, Graphics and Image Processing (ICVGIP), DOI: 10.1145/2425333.2425343, ACM Digital, December 2012, India.

4. Ranjit Ghoshal, **Anandarup Roy** and Swapan K. Parui, *Text Extraction from Scene Images using Statistical Distributions*, Proc. of the Int. Conf. on Emerging Applications of Information Technology (EAIT- 2012), pp. 187–190, IEEE CS press, Novenber 2012, India.

5. Ranjit Ghoshal, **Anandarup Roy**, Tapan Kumar Bhowmik and Swapan Kumar Parui, *Headline based text extraction from outdoor images*, Proc. of the Int. Conf. on Pattern Recognition and Machine Intelligence (PReMI- 2011), pp. 446–451, Springer-Verlag, Russia.

6. Ranjit Ghoshal, **Anandarup Roy**, Tapan Kumar Bhowmik and Swapan Kumar Parui, *Decision Tree Based Recognition of Bangla Text from Outdoor Scene Images*, Proc. of the Int. Conf. on Neural Information Processing (ICONIP- 2011), pp. 538-546, Springer-Verlag, November 2011, China.

7. Ranjit Ghoshal, **Anandarup Roy** and Swapan Kumar Parui, *Recognition of Bangla text from Scene Images through Perspective Correction*, Proc. of the Int. Conf. on Image Information Processing (ICIIP- 2011), pp. 1-6, IEEE CS press, November 2011, India.

8. **Anandarup Roy**, Swapan Kumar Parui, Debyani Nandi and Utpal Roy, *Color Image Segmentation Using a Semi-wrapped Gaussian Mixture Model*, Proc. of the Int. Conf. on Pattern Recognition and Machine Intelligence (PReMI- 2011), pp. 148-153, Springer-Verlag, June 2011, Russia.

9. Ranjit Ghoshal, **Anandarup Roy** and Swapan Kumar Parui, *Headline Based Text Extraction from Outdoor Images*, Proc. of the Int. Conf. on Pattern Recognition and Machine Intelligence (PReMI- 2011), pp. 446-451, Springer-Verlag, June 2011, Russia.

10. **Anandarup Roy**, Swapan Kumar Parui and Utpal Roy, *TASOCNN: A Topology Adaptive Self-Organizing Circular Neural Network and its Application to Color Segmentation*, Proc. of the Indian Conf. on Computer Vision, Graphics and Image Processing (ICVGIP), DOI: 10.1145/1924559.1924616, ACM Digital, December 2010, India.

11. **Anandarup Roy**, Swapan Kumar Parui, Amitav Paul and Utpal Roy, *Color Based Image Segmentation*, Proc. of Int. Conf. on Information Technology (ICIT- 2008), pp. 254-255, IEEE CS press, December 2008, India.

12. **Anandarup Roy**, Swapan Kumar Parui, Amitav Paul and Utpal Roy, *A Color Based Image Segmentation and its Application to Text Segmentation*, Proc. of Indian Conf. on Computer Vision, Graphics and Image Processing (ICVGIP- 2008), pp. 313- 319, IEEE CS press, December 2008, India.

13. Tapan Kumar Bhowmik, Pradip Ghanty, **Anandarup Roy**, Swapan Kumar Parui and Utpal Roy, *Skew Correction and Character Segmentation for Handwritten Bangla Words using Support Vector Machine*, Proc. of Int. Conf. on Information Technology (INTL-INFOTECH 07), pp. 572-577, March 2007, India.

14. P. Ghanty, **A. Roy**, N.R. Pal, D.P. Mukherjee, H. Kumar, M. Vasudevan, A.K. Bhaduri and P. Barat, *Fuzzy Logic and Image Processing based Approaches for Estimation of Weld Bead Geometry*, Proc. of 9^{th} Technical Programme Discussion Meeting of BRNS Projects (TPDM), pp. 20-27, February 2007, India.

15. **Anandarup Roy**, Swapan Kumar Parui and Utpal Roy, *A Beta Mixture Model Based Approach to Text Extraction from Color Images*, Proc. of Int. Conf. on Advances in Pattern Recognition (ICAPR- 2007), pp. 321-326, World Scientific, January 2007, India.

16. **Anandarup Roy**, Prabhat Kumar Ray and Swapan Kumar Parui, *Text Extraction from Color Images using a Mixture Model of Dirichlet Distributions*, Proc. of National

Conf. on Recent Trends in Information Systems (ReTIS 06), pp. 37-40, July 2006, India.

17. **A. Roy**, T.K. Bhowmik, S.K. Parui and U. Roy, *A Novel Approach to Skew Detection and Character Segmentation for Handwritten Bangla Words*, Proc. of Digital Image Computing: Techniques and Applications (DICTA 2005), pp. 203-210, IEEE CS Press, December 2005, Australia.

18. T.K. Bhowmik, **A. Roy** and U. Roy, *Character Segmentation for Handwritten Bangla words using Artificial Neural Network*, Proc. of International Workshop on Neural Networks and Learning in Document Analysis and Recognition (NNLDAR), pp. 28-32, August 2005, Korea.

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