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4. QALIFICATION:

- a. **PhD (pursuing)**- Jadavpur University
- b. **ME** -Jadavpur University
- c. **B.Tech** - W.B.U.T

5. Awards

- a. Selected as a fellow under **Visvesvaraya PhD Scheme** by *Electronics & IT under Ministry of Electronics and Information Technology*, Government of India.
- b. Winning team award in “**ICDAR 2019 Competition on Recognition of Early Indian Printed Documents- REID 2019**”, 15th International Conference on Document Analysis and Recognition (ICDAR). International Convention Centre, Sydney, Australia.
- c. Winning team award in “**ICDAR 2019 Competition on Document Image Binarization- DIBCO 2019**”, 15th International Conference on Document Analysis and Recognition (ICDAR). International Convention Centre, Sydney, Australia.

6. PUBLICATION

A. International Journal (07)

- I. **S. Bhowmik**, R. Sarkar, B. Das, D. Doermann, “GiB: A Game Theory Inspired Binarization Technique for Degraded Document Images”. *IEEE Transactions on Image Processing*, 28(3), 1443-1455, **2019**. [Impact Factor **5.071**], [SCI, UGC listed]
- II. 2. S. Malakar, M. Ghosh, **S. Bhowmik**, R. Sarkar, M. Nasipuri, “A GA based Hierarchical Feature Selection Approach for Handwritten Word Recognition”, *Neural Computing and Applications*, Springer, **2019**. (DOI: <https://doi.org/10.1007/s00521-018-3937-8>) [Impact Factor **4.213**], [SCI, UGC listed]
- III. 3. **S. Bhowmik**, R. Sarkar, M. Nasipuri, D. Doermann, “Text and Non-text Separation in Offline Document Images: a Survey”, *International Journal on Document Analysis and Recognition (IJ DAR)*, Springer, 21(1-2), 1-20, **2018**. [Impact Factor **1.298**], [SCI, UGC listed]
- IV. 4. **S. Bhowmik**, S. Malakar, R. Sarkar, S. Basu, M. Kundu, M. Nasipuri, “Off-line Bangla Handwritten Word Recognition: a Holistic Approach”, *Neural Computing and Applications*, Springer, **2018**. (DOI: <https://doi.org/10.1007/s00521-018-3389-1>) [Impact Factor **4.213**], [SCI, UGC listed]
- V. S. Sahoo, S. K. Nandi, S. Barua, P. Priyam, S. Bhowmik, S. Malakar, R. Sarkar, “Handwritten Bangla Word Recognition using Negative Refraction based Shape Transformation”, Special Issue on Ambient Advancements in Intelligent Computational Sciences for Journal of

Intelligent & Fuzzy Systems- Applications in Engineering and Technology, IOS Press, 35(2), pp. 1765-1777, 2018. [**Impact Factor 1.426**], [**SCI, UGC listed**]

- VI. S. Ghosh,, D. Lahiri, **S. Bhowmik**, E. Kavallieratou R. Sarkar, “Text/Non-Text Separation from Handwritten Document Images Using LBP Based Features: An Empirical Study”, *Journal of Imaging*, 4(4), 57, (2018). [**DBLP, Web of Science**]
- VII. 7. **S. Bhowmik**, S. Polley, M. G. Roushan, S. Malakar, R. Sarkar, M. Nasipuri, “A Holistic Word Recognition Technique for Handwritten Bangla Words”, *Int. J. Applied Pattern Recognition*, 2(2), pp.142–159, (2015). [**UGC listed**]

B. Book Chapter (01)

- I. Ghosh M., Malakar S., **Bhowmik S.**, Sarkar R., Nasipuri M. (2019) Feature Selection for Handwritten Word Recognition Using Memetic Algorithm. In: Mandal J., Dutta P., Mukhopadhyay S. (eds) *Advances in Intelligent Computing. Studies in Computational Intelligence*, vol 687. pp. 103-124, Springer, Singapore.

C. International Conferences (13)

- I. Ghosh, S., Ghosh, K.K., Chakraborty, S., **Bhowmik, S.**, Sarkar, R. (2019) A Filter Ensemble Feature Selection Method for Handwritten Numeral Recognition, *International Conference on Emerging Technologies for Sustainable Development (ICETSD '19)*, pp. 394-398.
- II. Ghosh, S., Bhattacharya, R., Majhi, **S., Bhowmik, S.**, Malakar, S., Sarkar, R., (2018) Textual content retrieval from Filled-in Form Images, 4th Workshop on Document Analysis and Recognition (DAR), 18 December 2018, IIIT Hyderabad, India.
- III. Sah, A. K., **Bhowmik, S.**, Malakar, S., Sarkar, R., Kavallieratou, E., & Vasilopoulos, N. (2017). Text and non-text recognition using modified HOG descriptor. In *Calcutta Conference (CALCON)*, (pp. 64-68). IEEE.
- IV. Ghosh, M., Malakar, **S., Bhowmik, S.**, Sarkar, R., Nasipuri, M., (2017) Memetic Algorithm based Feature Selection for handwritten City Name Recognition, In: Mandal J., Dutta P., Mukhopadhyay S. (eds) *Computational Intelligence, Communications, and Business Analytics. CICBA 2017. Communications in Computer and Information Science*, vol. 776, pp.599-613, Springer, Singapore.
- V. **Bhowmik, S.**, Kundu, S., De, B.K., Sarkar, R., Nasipuri, M., (2019) A two-stage approach for Text and Non-text Separation from Handwritten Scientific Document Images”, In: Chandra P., Giri D., Li F., Kar S., Jana D. (eds) *Information Technology and Applied Mathematics. Advances in Intelligent Systems and Computing*, vol 699. pp. 41-51, Springer, Singapore,.
- VI. **Bhowmik, S.**, Sen, S., Hori, N., Sarkar, R., Nasipuri, M. (2017). Handwritten Devanagari Numerals Recognition using Grid based Hausdroff Distance. In *Computer, Communication and Electrical Technology: Proceedings of the International Conference on Advancement of Computer Communication and Electrical Technology (ACCET 2016)*, (p. 15). CRC Press.
- VII. Barua, S., Malakar, S., **Bhowmik, S.**, Sarkar, R., Nasipuri, M. (2017). Bangla Handwritten City Name Recognition Using Gradient-Based Feature. In *Proceedings of the 5th International Conference on Frontiers in Intelligent Computing: Theory and Applications* (pp. 343-352). Springer, Singapore.
- VIII. Das, B., **Bhowmik, S.**, Saha, A., Sarkar, R. (2018). An Adaptive Foreground-Background Separation Method for Effective Binarization of Document Images. In: Abraham A., Cherukuri A., Madureira A., Muda A. (eds) *Eighth International Conference on Soft Computing and Pattern Recognition (SoCPaR 2016). Advances in Intelligent Systems and Computing*, vol 614. Springer, Cham (pp. 515-524).

- IX. **Bhowmik, S.**, Sarkar, R. Nasipuri, M. (2016) Text and Non-text separation in Handwritten Document Images using Local Binary Pattern Operator, In: Mandal J., Satapathy S., Sanyal M., Bhateja V. (eds) Proceedings of the First International Conference on Intelligent Computing and Communication. Advances in Intelligent Systems and Computing, vol. 458. pp. 507-515, Springer, Singapore.
- X. Singh, P. K., Mondal, A., **Bhowmik, S.**, Sarkar, R., Nasipuri, M. (2015) Word-Level Script Identification from Handwritten Multi-script Documents. In: Satapathy S., Biswal B., Udgata S., Mandal J. (eds) 3rd International Conference on Frontiers of Intelligent Computing: Theory and Applications (FICTA) 2014. Advances in Intelligent Systems and Computing, vol. 327. Springer, Cham (pp. 551-558).
- XI. Das, S., Singh, P. K., **Bhowmik, S.**, Sarkar, R., & Nasipuri, M. (2016). A Harmony Search Based Wrapper Feature Selection Method for Holistic Bangla Word Recognition. Procedia Computer Science, vol. 89, pp. 395-403.
- XII. **Bhowmik, S.**, Polley, S., Roushan, M.G., Malakar, S., Sarkar, R. Nasipuri, M, (2014) Handwritten Bangla Word Recognition using HOG Descriptor, In Emerging Applications of Information Technology (EAIT-2014), 4th International Conference on (pp. 193-197) IEEE.
- XIII. **Bhowmik, S.**, Malakar, S., Sarkar, R. Nasipuri, M, (2014) Handwritten Bangla Word Recognition using Elliptical Features, In Computational Intelligence and Communication Networks (ICCICN) 2014, The 6th International Conference on (pp. 257-261) IEEE.