Dr. MUNISH JINDAL

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Research Interests

Computer Vision; Document Analysis and System; Image Processing; Machine Learning; Pattern Recognition

Education

- M.C.A, I.K.G. Punjab Technical University, Jalandhar, Punjab, India
- M.E. in Computer Science & Engineering, Thapar University, Patiala, Punjab, India
- Ph.D. in Computer Science, Thapar University, Patiala, Punjab, India
- UGC-NET in Computer Science & Applications (Dec 2006)
- GATE-2007 in Computer Science & Engineering
- GATE-2008 in Information Technology

Research Guidance

- M. Tech Students Guided   08
- Ph.D. Students Guided   05 (Completed) + 04 (Pursuing)

Research Quality Citation Index

- Google Scholar Citations   1016
- Google Scholar h-index   18
- Google Scholar i10-index   27
- Research Gate Citations   945

Google Scholar: https://scholar.google.com/citations?hl=en&user=MaZLd1gAAAAJ

ResearchGate: https://www.researchgate.net/profile/Munish_Kumar16

Scopus: https://www.scopus.com/authid/detail.uri?authorId=26633172500

Research ID: https://publons.com/researcher/1873512/munish-kumar/

DBLP: https://dblp.org/pid/124/3780.html

Teaching Experience (10+Years)

- Assistant Professor in Computational Sciences,
  MRS Punjab Technical University, Bathinda, Punjab,
  India.

Period: Aug, 2016- Till date

- **A**ssistant Professor in Computer Science
  Panjab University Rural Centre, Kauni, Sri Muktsar Sahib,
  Punjab,
  India.
  Period: Aug, 2011- July 2016

- **A**ssistant Professor in Computer Applications
  Guru Gobind Singh College for Women, Sec–26
  Chandigarh, India.
  Period: Aug 2010 – July 2011

- **A**ssistant Professor in Computer Science
  Punjabi University Neighbourhood Campus, Jaito, Faridkot,
  Punjab, India.
  Period: Oct, 2008 – July 2010

Selected Publications in SCI/SCI-E Journals (70+)

(a) Published papers

[1] **Munish Kumar**, R. K. Sharma and M. K. Jindal, "A Novel Feature Extraction Technique for Offline Handwritten Gurmukhi Character Recognition", *IETE Journal of Research*, Vol. 59(6), pp. 687-692, 2013. **(SCI Indexed)**

https://www.tandfonline.com/doi/abs/10.4103/0377-2063.126961

[2] **Munish Kumar**, R. K. Sharma and M. K. Jindal, "Efficient Feature Extraction Techniques for Offline Handwritten Gurmukhi Character Recognition", *National Academy Science Letters*, Vol. 37(4), pp. 381-391, 2014. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s40009-014-0253-4

[3] **Munish Kumar**, R. K. Sharma and M. K. Jindal, "A Novel Hierarchical Technique for Offline Handwritten Gurmukhi Character Recognition", *National Academy Science Letters*, Vol. 37(6), pp. 567-572, 2014. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s40009-014-0280-1

[4] **Munish Kumar**, R. K. Sharma and M. K. Jindal, "A Framework for Grading Writers using Offline Gurmukhi Characters", *Proceedings of the National Academy of Sciences-Physical Science- A*, Vol. 86(3), pp. 405-415, 2016. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s40010-016-0277-x

[5] **Munish Kumar**, R. K. Sharma and M. K. Jindal, "Offline Handwritten Gurmukhi Character Recognition: Analytical Study of different Transformations", *Proceedings of the National Academy of Sciences- Physical Science- A*, Vol. 87(1), pp. 137-143, 2017. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s40010-016-0284-y

[6] **Munish Kumar**, M. K. Jindal and R. K. Sharma, "A Novel Technique for Line Segmentation in Offline Handwritten Gurmukhi Script Documents", *National Academy Science Letters*, Vol. 40(4), pp. 273-277, 2017. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s40009-017-0558-1

[7] **Munish Kumar**, and S. R. Jindal, "Devanagari Handwritten Grading System Based on Curvature Features", *Computer Modeling in Engineering & Sciences*, Vol. 113 (2), pp. 201-209, 2017. **(SCI Indexed)**

https://www.techscience.com/CMES/v113n2/27349

[8] **Munish Kumar**, M. K. Jindal and R. K. Sharma, "A Novel Handwriting Grading System Using Gurmukhi Characters", *International Arab Journal of Information Technology*, Vol. 15 (6), pp. 945-950, 2018. **(SCI Indexed)**

http://iajit.org/index.php?option=com_content&task=view&id=1635&Itemid=25

[9] **Munish Kumar**, M. K. Jindal, R. K. Sharma and S. R. Jindal, "Offline Handwritten Numeral Recognition using Combination of Different Feature Extraction Techniques", *National Academy Science Letters*, Vol. 41(1), pp. 29-33, 2018. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s40009-017-0606-x

[10] Malika Arora, **Munish Kumar** and N. K. Garg, "Facial Emotion Recognition Based on PCA and Gradient Features", *National Academy Science Letters*, Vol. 41 (6), pp. 365-368, 2018. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s40009-018-0694-2

[11] **Munish Kumar**, P. Chhabra and N. K. Garg, "An Efficient Content Based Image Retrieval System Using BayesNet and K-NN", *Multimedia Tools and Applications*, Vol. 77 (16), pp. 21557-21570, 2018. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s11042-017-5587-8

[12] Diksha Garg, N. K. Garg and **Munish Kumar**, "Underwater Image Enhancement using Blending of CLAHE and Percentile Methodologies", *Multimedia Tools and Applications*, Vol. 77 (20), pp. 26545-26561, 2018. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s11042-018-5878-8

[13] H. Kaur and **Munish Kumar**, "A Comprehensive Survey on Word Recognition for non-Indic and Indic Scripts", *Pattern Analysis and Applications*, Vol. 21(4), pp. 897-929, 2018. **(SCI Indexed)**

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[14] **Munish Kumar**, M. K. Jindal, R. K. Sharma and S. R. Jindal, "A Novel Framework for Writer Identification Based on Pre-Segmented Gurmukhi Characters", *SADHANA*, Vol. 43(12), pp. 197, 2018. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s12046-018-0966-z

[15] P. Chhabra, N. K. Garg and **Munish Kumar**, "Content-Based Image Retrieval System using ORB and SIFT Features", *Neural Computing and Applications*, Vol. 32, pp. 2725–2733, 2020. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s00521-018-3677-9

[16] **Munish Kumar**, M. K. Jindal, R. K. Sharma and S. R. Jindal, "Character and Numeral Recognition for Non-Indic and Indic Scripts: A Survey", *Artificial Intelligence Review*, Vol. 52(4), pp. 2235-2261, 2019. DOI: 10.1007/s10462-017-9607-x **(SCI Indexed)**

https://link.springer.com/article/10.1007/s10462-017-9607-x

[17] A. Kumar, A. Kaur and **Munish Kumar**, "Face Detection Techniques: A Review", *Artificial Intelligence Review*, Vol. 52(2), pp. 927-948, 2019. **(SCI Indexed)**

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[18] **Munish Kumar** and S. R. Jindal, "Fusion of RGB and HSV Colour Space for Foggy Image Quality Enhancement", *Multimedia Tools and Applications*, Vol. 78(8), pp. 9791-9799, 2019. **(SCI Indexed)**

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[19] **Munish Kumar**, S. R. Jindal, M. K. Jindal and G. S. Lehal, "Improved Recognition Results of Medieval Handwritten Gurmukhi Manuscripts using Boosting and Bagging Methodologies", *Neural Processing Letters*, Vol. 50(1), pp. 43-56, 2019. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s11063-018-9913-6

[20] S. Dargon and **Munish Kumar**, "Writer Identification System for Indic and Non-Indic Scripts: State-of-the-art Survey", *Archives of Computational Methods in Engineering*, Vol. 26(4), pp. 1283-1311, 2019. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s11831-018-9278-z

[21] P. Kaur, R. Kumar and **Munish Kumar**, "A Healthcare Monitoring System using Random Forest and Internet of Things (IoT)", *Multimedia Tools and Applications*, Vol. 78(14), pp. 19905-19916, 2019. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s11042-019-7327-8

[22] S. Goel, R. Kumar, **Munish Kumar** and V. Chopra, "An Efficient Page Ranking Approach Based on Vector Norms using sNorm (p) Algorithm", *Information Processing and Management*, Vol. 56(3), pp. 1053-1066, 2019. **(SCI Indexed)**

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[23] **Munish Kumar** and S. R. Jindal, "A Study of Recognition of Pre-Segmented Handwritten Multi-lingual Characters", *Archives of Computational Methods in Engineering*, Vol. 27, pp. 577–589, 2020. **(SCI Indexed)**

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[27] S. Dargan, **Munish Kumar**, M. R. Ayyagari, and G. Kumar, "A Survey of Deep Learning and Its Applications: A New Paradigm to Machine Learning", *Archives of Computational Methods in Engineering*, Vol. 27, pages1071–1092, 2019. **(SCI Indexed)**

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[28] **Munish Kumar**, M. K. Jindal, R. K. Sharma, and S. R. Jindal, "Performance Evaluation of Classifiers for the Recognition of Offline Handwritten Gurumukhi Characters and Numerals: A Study", *Artificial Intelligence Review*, Vol. 53, pp. 2075–2097, 2020. **(SCI Indexed)**

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[29] R. P. Kaur, M. K. Jindal and **Munish Kumar**, "Recognition of Newspaper Printed in Gurmukhi Script", *Journal of Central South University*, Vol. 26(9), pp. 2495-2503, 2019 **(SCI Indexed)**

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[30] S. R. Narang, M. K. Jindal and **Munish Kumar**, "Line Segmentation of Devanagari Ancient Manuscript", *Proceedings of the National Academy of Sciences- Physical Science- A*, Vol. 90, pp. 717–724, 2019. **(SCI Indexed)**

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[31] A. Singh, V. Kadyan, **Munish Kumar**, and N. Baggan "ASRoIL: a comprehensive survey for automatic speech recognition of Indian languages", *Artificial Intelligence Review*, Vol. 53, pp. 3673–3704, 2020. **(SCI Indexed)**

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[32] S. Gupta and **Munish Kumar**, "Forensic document examination system using boosting and bagging methodologies", *Soft Computing*, Vol. 24, pp. 5409–5426, 2020. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s00500-019-04297-5

[33] S. Gupta, **Munish Kumar** and A. Garg, "Improved Object Recognition Results using SIFT and ORB Feature Detector", *Multimedia Tools and Applications*, Vol. 78, pp. 34157–34171, 2019. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s11042-019-08232-6

[34] **Munish Kumar**, Surbhi Gupta, Xiao-Zhi Gao, Amitoj Singh, "Plant Species Recognition Using Morphological Features and Adaptive Boosting Methodology", *IEEE Access*, Vol. 7, pp. 163912-163918, 2019. **(SCI Indexed)**

https://ieeexplore.ieee.org/document/8894140

[35] S. Dargan and **Munish Kumar**, A. Garg and K. Thakur, "Writer Identification System for Pre-Segmented Offline Handwritten Devanagari Characters using k-NN and SVM", *Soft Computing*, Vol. 24, pp. 10111–10122, 2019. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s00500-019-04525-y

[36] R. P. Kaur, **Munish Kumar** and M. K. Jindal, "Newspaper Text Recognition of Gurumukhi Script Using Random Forest Classifier", *Multimedia Tools and Applications*, Vol. 79, pp. 7435–7448, 2020. **(SCI Indexed)**

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[37] S. Dargan and **Munish Kumar**, "A comprehensive survey on the biometric recognition systems based on physiological and behavioral modalities", *Expert Systems with Applications*, Vol. 143, 1131142020, 2020. **(SCI Indexed)**

https://www.sciencedirect.com/science/article/abs/pii/S0957417419308310

[38] **Munish Kumar**, S. Gupta and N. Mohan, "A Computational Approach for Printed Document Forensics using SURF and ORB Features" *Soft Computing*, Vol. 24, pp. 13197-13208, 2020 **(SCI Indexed)**

https://link.springer.com/article/10.1007/s00500-020-04733-x

[39] S. Gupta, K. Thakur and **Munish Kumar**, "2D-Human Face Recognition Using SIFT and SURF descriptors of Face's Feature Regions" *The Visual Computer*, pp. 1-10, 2020 (In Press), **(SCI Indexed)**

https://link.springer.com/article/10.1007/s00371-020-01814-8

[40] M. Bansal, **Munish Kumar**, and M. Kumar, "2D Object Recognition Techniques: State- of-the-Art Work", *Archives of Computational Methods in Engineering*, pp. 1-15, 2020 (In Press), **(SCI Indexed)**

https://link.springer.com/article/10.1007/s11831-020-09409-1

[41] S. R. Narang, M. K. Jindal and **Munish Kumar**, "Ancient Text Recognition: A Review" *Artificial Intelligence Review*, Vol. 53, pp. 5517–5558, 2020. DOI: 10.1007/s10462-020-09827-4 **(SCI Indexed)**

https://link.springer.com/article/10.1007/s10462-020-09827-4

[42] I. R. Parray, S. Singh and **Munish Kumar**, "Time Series Data Analysis of Stock Price Movement Using Machine Learning Techniques", *Soft Computing*, Vol. 24, pp. 16509-16517, 2020. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s00500-020-04957-x

[43] S. R. Narang, M. K. Jindal, S. Ahuja, and **Munish Kumar**, "On the Recognition of Devanagari Ancient Handwritten Characters using SIFT and Gabor Features", *Soft Computing*, Vol. 24, pp. 17279-17289, 2020 **(SCI Indexed)**

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[44] S. Gupta, N. Mohan and Munish Kumar, "A Study on Source Device Attribution using Still Images", *Archives of Computational Methods in Engineering*, 2020. **(SCI Indexed)**

https://link.springer.com/article/10.1007/s11831-020-09452-y

[45] R. P. Kaur, M. K. Jindal, and **Munish Kumar**, "Text and Graphics Segmentation of Newspaper Printed in Gurmukhi Script: A Hybrid Approach", *The Visual Computer*, 2020 (In Press), **(SCI Indexed)**

https://link.springer.com/article/10.1007/s00371-020-01927-0

[46] Y. Kumar, N. Singh, **Munish Kumar**, and A. Singh "AutoSSR: an efficient approach for automatic spontaneous speech recognition model for the Punjabi Language", *Soft Computing*, Vol. 25, pp. 1617–1630, 2021 **(SCI Indexed)**

https://link.springer.com/article/10.1007/s00500-020-05248-1

[47] M. Mittal, **Munish Kumar**, A. Verma, I. Kaur, B. Kaur, M. Sharma and L. M. Goyal,

"FEMT: a computational approach for fog elimination using multiple thresholds", *Multimedia Tools and Applications*, Vol. 80, pp. 227–241, 2021 **(SCI Indexed).**

https://link.springer.com/article/10.1007/s11042-020-09657-0

[48] M. Arora and **Munish Kumar**, "AutoFER: PCA and PSO Based Automatic Facial Emotion Recognition", *Multimedia Tools and Applications*, Vol. 80, pp. 3039–3049, 2021. **(SCI Indexed).**

https://link.springer.com/article/10.1007/s11042-020-09726-4

[49] H. Kaur and **Munish Kumar**, "Offline Handwritten Gurumukhi Word Recognition Using eXtreme Gradient Boosting Methodology", *Soft Computing*, 2020 (In Press), **(SCI Indexed).**

https://link.springer.com/article/10.1007/s00500-020-05455-w

[50] M. Bansal, **Munish Kumar**, M. Kumar, K. Kumar "An Efficient Technique for Object Recognition Using Shi-Tomasi Corner Detection Algorithm", *Soft Computing*, 2020 (In Press), **(SCI Indexed).**

https://link.springer.com/article/10.1007/s00500-020-05453-y

[51] H. Kaur and **Munish Kumar** "On the Recognition of Offline Handwritten Word Using Holistic Approach and AdaBoost Methodology", *Multimedia Tools and Applications*, 2021 (In Press), **(SCI Indexed).**

https://link.springer.com/article/10.1007/s11042-020-10297-7

[52] A. Kumar, **Munish Kumar**, A. Kaur "Face Detection in Still Images under Occlusion and non-uniform illumination" *Multimedia Tools and Applications*, 2021 (In Press), **(SCI Indexed).**

https://link.springer.com/article/10.1007/s11042-020-10457-9

[53] S. Rani, M. Kaur and **Munish Kumar** "Detection of Shilling Attack in Recommender System for YouTube Video Statistics using Machine Learning Techniques", *Soft Computing*, 2021 (In Press), **(SCI Indexed).**

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[54] K. Kapoor, S. Rani, **Munish Kumar**, V. Chopra and G. S. Brar "Hybrid Local Phase

Quantization and Grey Wolf Optimization Based SVM for Finger Vein Recognition", *Multimedia Tools and Applications*, 2021 (In Press), **(SCI Indexed).**

https://link.springer.com/article/10.1007/s11042-021-10548-1

[55] H. Singh, R. K. Sharma, V. P. Singh and **Munish Kumar** "Recognition of Online Handwritten Gurmukhi Characters Using Recurrent Neural Network", *Soft Computing*, 2021 (In Press), **(SCI Indexed).**

https://link.springer.com/article/10.1007/s00500-021-05620-9

[56] **Munish Kumar**, N. Singh, R. Kumar, S. Goel and K. Kumar "Gait Recognition Based on Vision Systems: A Systematic Survey", *Journal of Visual Communication and Image Representation*, Vol. 75, pp. 103052, 2021, **(SCI Indexed).**

https://www.sciencedirect.com/science/article/abs/pii/S1047320321000249

[57] S. Singh, U. Ahuja, **Munish Kumar**, K. Kumar and M. Sachdeva, "Face mask detection using YOLOv3 and faster R-CNN models: COVID-19 environment", *Multimedia Tools and Applications*, 2021, **(SCI Indexed).**

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[58] K. Shaheed, A. Mao, I. Qureshi, **Munish Kumar**, Q. Abbas, I. Ullah and X. Zhang, "A Systematic Review on Physiological-Based Biometric Recognition Systems: Current and Future Trends," *Archives of Computational Methods in Engineering*, 2021 **(SCI Indexed).**

https://link.springer.com/article/10.1007/s11831-021-09560-3

[59] L. M. Goyal, M. Mittal, **Munish Kumar**, B. Kaur, M. Sharma and A. Verma, "An efficient method of multicolor detection using global optimum thresholding for image analysis, *Multimedia Tools and Applications*, 2021, **(SCI Indexed).**

https://link.springer.com/article/10.1007/s11042-020-10365-y

[60] M. Bansal, **Munish Kumar** and M. Kumar, "2D Object Recognition: A Comparative Analysis of SIFT, SURF and ORB Feature Descriptors", *Multimedia Tools and Applications*, 2021, **(SCI Indexed).**

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Selected Publications in other Journals (06)

[61] **Munish Kumar**, R. K. Sharma and M. K. Jindal, "Size of Training set vis-Ã–vis Recognition Accuracy of Handwritten Character Recognition System", *Journal of Emerging Technologies in Web Intelligence*, Vol. 5(4), pp. 380-384, 2013.

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[63] **Munish Kumar**, M. K. Jindal and R. K. Sharma, "MDP Feature Extraction Technique for Offline Handwritten Gurmukhi Character Recognition", *Smart Computing Review*, Vol. 3(6), pp. 397-404, 2013.

[64] **Munish Kumar**, R. K. Sharma and M. K. Jindal, "Segmentation of Isolated and Touching Characters in Offline Handwritten Gurmukhi Script Recognition", *International Journal of Information Technology and Computer Science*, Vol. 2, pp. 58-63, 2013.

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[66] **Munish Kumar**, S. Gupta, K. Kumar and M. Sachdeva, "Spreading of Covid-19 in India, Italy, Japan, Spain, UK, US: A Prediction Using ARIMA and LSTM Model", *Digital Government: Research and Practice*, Article No. 24, 2020.

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Selected Publications in the Proceedings of International Conferences (16)

[67] **Munish Kumar**, R. K. Sharma and M. K. Jindal, "Segmentation of Lines and Words in Handwritten Gurmukhi Script Documents", *Proceedings of the First International Conference on Intelligent Interactive Technologies and Multimedia*, Allahabad, pp. 28-30,

2010.

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[68]   **Munish Kumar**, M. K. Jindal and R. K. Sharma, "k-Nearest Neighbour Based Offline Handwritten Gurmukhi Character Recognition", *Proceedings of International Conference on Image Information Processing*, Jaypee University of Information Technology, Waknaghat (Shimla), pp. 1-4, 2011.

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[70]   **Munish Kumar**, M. K. Jindal and R. K. Sharma, "Offline Handwritten Gurmukhi Character Recognition Using Curvature Feature", *Proceedings of International Conference on Advances in Modeling, Optimization and Computing*, IIT Roorkee, pp. 981-989, 2011.

[71]   S. Gupta, Y. J. Singh and **Munish Kumar**, "Object Detection Using Multiple Shape-Based Features", *Proceedings of International Conference on Parallel, Distributed and Grid Computing (PDGC-2018),* Jaypee University of Information Technology, Waknaghat (Shimla), pp. 433-437, 2017.

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[72]   M. Khatri, **Munish Kumar** and A. Jain, "Pulmonary Lesion Detection and Staging from CT Images Using Watershed Algorithm", *Proceedings of the 8th International Conference on Advance Computing Conference (IACC), Benett University, Noida*, pp. 108-112, 2018.

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[73]   **Munish Kumar**, M. K. Jindal, R. K. Sharma and S. R. Jindal, "Performance Comparison of Several Feature Selection Techniques for Offline Handwritten Character Recognition", *Proceedings of International Conference on Research in Intelligent and Computing in Engineering,* pp. 1-6, 2018.

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[74] R. P. Kaur, M. K. Jindal and **Munish Kumar**, "Zone Segmentation of a Text line Printed in Gurmukhi Script Newspaper", *Proceedings of 5th International Conference on Parallel, Distributed and Grid Computing (PDGC-2018),* Jaypee University of Information Technology, Waknaghat (Shimla), pp. 330-334, 2018.

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[75] H. Singh, R. K. Sharma and **Munish Kumar**, "A Benchmark Dataset of Online Handwritten Gurmukhi Script Words and Numerals", *Proceedings of the International Conference on Computer Vision and Image Processing*, Jaipur, India, 2019.

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[76] R. P. Kaur, M. K. Jindal and **Munish Kumar**, "Newspaper Text Recognition of Gurmukhi Script using Random Forest Classifier", *Proceedings of International Conference on Machine Intelligence and Data Science Applications (MIDAS-2020),* 2020.

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Benchmark Dataset Published

- **https://sites.google.com/view/gurmukhi-benchmark/**

Patents Filed (05)

- "AGRICULTURAL FERTILIZER SPREADING APPARATUS AND METHOD THEREOF" Application No. TEMP/E-1/26636/2019-DEL

- "REAL TIME OBJECT RECOGNITION METHOD" Application No. 2020103520 (Australian Government, IP Australia) **Granted**

- "A METHOD TO WORD RECOGNITION FOR THE POSTAL AUTOMATION AND A SYSTEM THEREOF" Application No. 2021100089 (Australian Government, IP Australia) **Granted**

- "A SYSTEM AND METHOD FOR AUTOMATIC PLAYLIST GENERATION BY ANALYSING HUMAN EMOTIONS THROUGH PHYSIOLOGICAL SIGNALS" Application No. 2021101097 (Australian Government, IP Australia) **Granted**

- "A METHOD FOR GENDER CLASSIFICATION BASED ON OFFLINE HANDWRITING AND A SYSTEM THEREOF" Application No. 2021101078 (Australian Government, IP Australia) **Granted**

Conference/Seminar/Short Term Courses/Faculty Development Program Attended

- Microsoft Sponsored Faculty Development Program on "Microsoft Office" from 18th-19th Sep, 2017.

- NITTTR Sponsored Short Term Course on "Data Mining and Business Intelligence", from 04th-08th Sep, 2017.

- NITTTR Sponsored Short Term Course on "SciLab Programming", from 21st-25th Aug, 2017.

- NITTTR Sponsored Short Term Course on "Wireless Networks", from 22nd-26th May, 2017.

- NITTTR Sponsored Short Term Course on "Artificial Neural Network and Fuzzy Logic", from 24th-28th April, 2017.

- Google Sponsored Faculty Development Program on "Android Applications Development" from 09th-13th Jan, 2017.

- NITTTR Sponsored Short Term Course on "Open-Source Technologies Through ICT", from 29th Aug-02nd Sep, 2016

- National Workshop on Multilingual Technologies 2013 at Punjabi University, Patiala from 11th-17th Nov, 2013

- QIP on "Society and Web", at IIT Guwahati (1 week)

- Faculty Development Program at MSIT, New Delhi on 22nd May, 2010

- Role of IT in Technical Education at MIMIT, Malout (2 weeks)

- Seminar on RAFIP-2010 at Punjabi University, Patiala on 30th March, 2010

- National Conference on RAFIT-2009 at Punjabi University, Patiala on 9th-10th April, 2009.

Conference/Seminar/Short Term Courses Organized

- Short Term Course on "Artificial Neural Network and Fuzzy Logic", at GZS Campus College of Engineering & Technology, Bathinda from 24th-28th April, 2017.

Administrative Experience

- Member, Administrative, Academic and Technical Committees of Department of Computational Sciences, Maharaja Ranjit Singh Punjab Technical University, Bathinda

- Member, Department Research Board, Department of Computational Sciences, Maharaja Ranjit Singh Punjab Technical University, Bathinda

- Member of Admission Committee 2017-18, Maharaja Ranjit Singh Punjab Technical University, Bathinda

- Member of Admission Committee 2018-19, 2019-20, 2020-21 at Maharaja Ranjit Singh Punjab Technical University, Bathinda

- Member of Maharaja Ranjit Singh Punjab Technical University, Bathinda Youth Festival Committee 2017

- Placement Coordinator, Department of Computer Applications, Maharaja Ranjit Singh Punjab Technical University, Bathinda

- Day Scholar Warden, Maharaja Ranjit Singh Punjab Technical University, Bathinda

- Member, Inspection Committees for granting courses affiliation to various colleges of Maharaja Ranjit Singh Punjab Technical University Bathinda

- <u>In-charge at Punjabi University Neighbourhood Campus, Jaito (Faridkot) from Oct, 2008 to Aug, 2010.</u>

- <u>Member, Board of Studies for Post-Graduate/Under-Graduate Computer Courses [MCA, BCA, M.Sc. (IT), BA/BSc (IT, Computer Science, Computer Applications), at Maharaja Ranjit Singh Punjab Technical University, Bathinda.</u>

Other Responsibilities

- Member of International Association of Computer Science and Information technology (IACSIT), Singapore.
- Member of International Association of Engineers (IAENG), Hong-Kong.
- Reviewer of Proceedings of the National Academy of Sciences- Physical Science- A (SCI Indexed Journal)
- Reviewer of IETE Journal of Research Journal (SCI Indexed Journal)
- Reviewer of Information Processing and Management Journal (SCI Indexed Journal)
- Reviewer of Artificial Intelligence Review Journal (SCI Indexed Journal)
- Reviewer of IEEE Access Journal (SCI Indexed Journal)
- Reviewer of Expert Systems with Applications Journal (SCI Indexed Journal)
- Reviewer of Optik Journal (SCI Indexed Journal)

References

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