MUDASIR AHMAD GANAIE

Google-Scholar Link, GitHub Link

CONTACT INFORMATION
Department of Mathematics, Indian Institute of Technology Indore, India
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RESEARCH INTERESTS
Machine Learning, Ensemble Learning, Support Vector Machines, Ensemble Deep Learning, Neuroimaging, Image Forensics, Optimization, Image Processing

ACADEMIC PROFILE

Indian Institute of Technology (IIT) Indore

Doctor of Philosophy (Ph.D.), Department of Mathematics

- Advisor: Dr. M. Tanveer, Associate Professor
- Thesis Submitted

Indian Institute of Technology (IIT) Indore **July, 2018 - June, 2019**

Junior Research Fellow (JRF), Department of Mathematics

- Advisor: Dr. M. Tanveer, Associate Professor

Aligarh Muslim University, Aligarh, India **2016-2018**

Master of Technology, Computer Science & Engineering *CGPA:* 9.444

- Advisor: Dr. Saiful Islam, Professor

University of Kashmir, J&K, India **2011-2015**

Bachelor of Technology, Computer Science & Engineering *Marks:* 79.47%

J&K State Board of School Education, J&K, India **2010**

Senior Secondary (12^{th}) *Marks:* 83.6%

J&K State Board of School Education, J&K, India **2008**

Secondary (10^{th}) *Marks:* 84%

ACADEMIC ACHIEVEMENTS

- Qualified UGC **National Eligibility Test(NET)** in November-2017.
- Qualified **GATE** 2016 with 92.97 percentile.
- Qualified **GATE** 2017 with 91.78 percentile.
- Qualified **GATE** 2018 with 91.23 percentile.
- Awarded All India Council of Technical Education (AICTE) PG (GATE/GPAT) Scholarship.
- Awarded Merit-cum-Means Scholarship from the Govt. of India.

PROJECTS UNDERTAKEN

Optimization models and algorithms for non-parallel SVM 07/2018 - 06/2019
Advisor: Dr. M. Tanveer, Associate Professor, IIT Indore

- To review the recent development in the area of non-parallel SVM.
- To develop optimization algorithms for large scale least squares twin support vector machines.
- To develop robust and sparse algorithms for non-parallel SVM's.
- To develop novel ensemble techniques for the classification problems.

Operator detection in digital Image Forensics Aug 2017 -– June 2018
Advisor: Dr. Saiful Islam, Professor, Aligarh Muslim University

- In this project, the main goal was to authenticate the credibility of an image whether an image has been forged or not.
- Based upon the statistical fingerprints left by each operator applied, we analyze the integrity of an image.
- It is a classification problem, wherein we need to evaluate whether the image has been forged or not. If the image has been forged, we have to reveal the processing history the image has been through.

Inventory Management System Jan 2016 – May 2016

Advisor: Prof. M. Sarosh Umar, Professor, Aligarh Muslim University

- This is a web application where the office work of the AMU, Computer Engineering Department has been automated.
- This application introduced the online processing of assignments and projects. We also added the functionality of student feedback system in the portal.
- The languages used are PHP, mySql, CSS.

Face recognition using hybrid approach Jan 2015 -– June 2015

Advisor: Er. Manzoor Ahmad Lone, Assistant Professor, University of Kashmir

- Given the query image, we have to identify the person based on the features extracted from the knowledge base.
- In this project, we used Principal Component Analysis (PCA) and Disrete Wavelet Transform (DWT) techniques for feature extraction of faces.
- We evaluated our results on ORL database.

TECHNICAL SKILLS

Programming Languages: MATLAB, Python, C/C++, PHP, Asp.Net, HTML
Tools & Packages: L_AT^EX, Beamer, Weka, MS Office

RELEVANT COURSES

Image Processing, Digital Image Forensics, Machine Learning & Pattern Recognition, Computer Vision.

TEACHING EXPERIENCE

1. Linear Algebra tutorial classes to the B.Tech students at Indian Institute of Technology Indore. 2019-2020
2. MATLAB tutorial classes to the M Sc Students in Department of Mathematics, Indian Institute of Technology Indore. 2018-2019
3. Taught C-programming to undergraduate students at Computer Programming Lab, Department of Computer Engineering, AMU Aligarh. 2016-2018

RESEARCH EXPERIENCE

Junior Research Fellow (JRF) in the Department of Mathematics, IIT Indore on the project entitled, "Optimization Models and Algorithms for non-parallel support vector machines" under the supervision of Dr. M. Tanveer. [July, 2018 - June, 2019]

PUBLICATIONS:

JOURNALS

1. **M. A. Ganaie**, M. Tanveer, and C.T. Lin "*Large scale fuzzy least squares twin support vector machines for class imbalance learning*" IEEE Transactions on Fuzzy Systems (**I.F=12.03**)
2. M. Tanveer, **M. A. Ganaie**, A Bhattacharjee and C.T. Lin "*Intuitionistic fuzzy weighted least squares twin SVMs*" IEEE Transactions on Cybernetics, (2022) (**I.F=11.448**)

3. **M. A. Ganaie**, and M. Tanveer "*KNN weighted reduced universum twin SVM for class imbalance learning*" Knowledge-Based Systems, (2022) (**I.F.=8.038**).

4. M. Tanveer, Jatin Jangir, **M. A. Ganaie**, Iman Beheshti, M. Tabish, and Nikunj Chhabra "***Diagnosis of Schizophrenia**: A comprehensive evaluation*" IEEE Journal of Biomedical and Health Informatics (2022) (I.F.=5.36).

5. M. Tanveer and T. Rajani and R. Rastogi and YH Shao and **M. A. Ganaie** "Comprehensive review on twin support vector machines." Annals of Operations Research (2022), Springer, **I.F.=4.854**).

6. **M. A. Ganaie**, M. Tanveer, and Iman Beheshti "***Brain age prediction** with improved least squares TSVR*" IEEE Journal of Biomedical and Health Informatics (2022) (**I.F.=5.77**)

7. A. K Malik, **M. A. Ganaie**, M. Tanveer, P.N. Suganthan "***Alzheimer's disease diagnosis** via intuitionistic fuzzy random vector functional link network*" IEEE Transactions on Computational Social Systems (2022)

8. M. Tanveer, A. Tiwari, R. Choudhary, and **M. A. Ganaie** "*Large-scale pinball twin support vector machines*" Machine Learning (2021) (DOI: 10.1007/s10994-021-06061-z) (**I.F.=2.940**)

9. **M. A. Ganaie**, and M. Tanveer and ADNI "Fuzzy least squares projection twin support vector machines for class imbalance learning." Applied Soft Computing 113 (2021): 107933. (**I.F.=6.725**)

10. M. Tanveer, **M. A. Ganaie**, and P. N. Suganthan. *"Ensemble of classification models with weighted functional link network."* Applied Soft Computing 107 (2021): 107322. (**I.F.=6.725**)

11. I. Beheshti, **M. A. Ganaie**, V. Paliwal, A. Rastogi, I. Razzak, M. Tanveer (2021). *"**Predicting brain age** using machine learning algorithms: A comprehensive evaluation".* IEEE Journal of Biomedical and Health Informatics. (DOI: 10.1109/JBHI.2021.3083187) (**I.F.=5.77**)

12. M. Tanveer, A. H. Rashid, **M. A. Ganaie**, M. Reza, I. Razzak, and K. L. Hua (2021). *"**Classification of Alzheimer's disease** using ensemble of deep neural networks trained through transfer learning."* IEEE Journal of Biomedical and Health Informatics. (**I.F.=5.77**)

13. **M. A. Ganaie**, I. Beheshti, M. Tanveer "**Brain age prediction** using improved twin SVR." Neural Computing and Applications (2021): 1-11. (**I.F.=5.606**)

14. **M. A. Ganaie**, and M. Tanveer *"LSTSVM classifier with enhanced features from pre-trained functional link network."* Applied Soft Computing (2020): 106305. (**I.F.=6.725**)

15. **M. A. Ganaie**, M. Tanveer, and P. N. Suganthan *"Oblique decision tree ensemble via twin bounded SVM."* Expert Systems with Applications 143 (2020): 113072. (**I.F.=6.954**)

16. **M. A. Ganaie**, S. Ghosh, N. Mendola, M. Tanveer, and S. Jalan *"Identification of chimera using machine learning."* Chaos: An Interdisciplinary Journal of Nonlinear Science 30.6 (2020): 063128. (**I.F.=3.642**)

UNDER REVISION

17. **M. A. Ganaie**, M. Tanveer, P.N. Suganthan and V. Snasel "*Oblique and Rotation Double Random Forest*" arXiv preprint arXiv:2111.02010 [Submitted to Neural Networks (I.F=8.05)].

18. **M. A. Ganaie**, M. Tanveer, "*Ensemble of deep random vector functional link network using privileged information for* ***Alzheimer's disease diagnosis***" IEEE/ACM Transactions on Computational Biology and Bioinformatics (I.F=3.71)

UNDER REVIEW

19. **M. A. Ganaie**, Minghui Hu, A.K. Malik, M. Tanveer, and P. N. Suganthan "*Ensemble deep learning: A review*" arXiv preprint arXiv:2104.02395 (2021) (Elsevier, Neural Networks, I.F=8.05)

CONFERENCES

1. **M. A. Ganaie**, M. Tanveer, and P. N. Suganthan. *"Co-Trained Random Vector Functional Link Network."* 2021 International Joint Conference on Neural Networks, IJCNN. IEEE, 2021. (Core Rank A)

2. A. K Malik, **M. A. Ganaie**, M. Tanveer, and P. N. Suganthan. *"A Novel Ensemble Method of RVFL For Classification Problem."* 2021 International Joint Conference on Neural Networks, IJCNN. IEEE, 2021. (Core Rank A)

3. **M. A. Ganaie**, and M. Tanveer "*Energy based least squares projection twin SVM*" International Conference on Machine Intelligence and Signal Processing (MISP 2021).

4. **M. A. Ganaie**, M. Tanveer, and P. N. Suganthan. *"Minimum Variance Embedded Random Vector Functional Link Network."* International Conference on Neural Information Processing (ICONIP 2020). (Core Rank A)

5. **M. A. Ganaie**, M. Tanveer, and P. N. Suganthan. *"Regularized robust fuzzy least squares twin support vector machine for class imbalance learning."* 2020 International Joint Conference on Neural Networks, IJCNN. IEEE, 2020. (Core Rank A)

6. M. Tanveer, T. Rajani, and **M. A. Ganaie** *"Improved sparse pinball twin SVM."* 2019 IEEE International Conference on Systems, Man and Cybernetics (SMC). IEEE, 2019. (Core Rank B)

BOOK CHAPTERS

1. **M. A. Ganaie**, and M. Tanveer. *"Robust general twin support vector machine with pinball loss function."* Machine Learning for Intelligent Multimedia Analytics. Springer, Singapore, 2021. 103-125.

CONTRIBUTED TALKS

- Presented paper in MISP-2021: **M. A. Ganaie** and M. Tanveer *"Energy Based Least Squares Projection Twin SVM."* International Conference on Machine Intelligence and Signal Processing (MISP 2021).

- Presented paper in IJCNN-2021: **M. A. Ganaie**, M. Tanveer, and P. N. Suganthan. *"Co-Trained Random Vector Functional Link Network."* International Joint Conference on Neural Networks, IJCNN. IEEE, 2021.

- Presented paper in ICONIP-2020: **M. A. Ganaie**, M. Tanveer, and P. N. Suganthan. *"Minimum Variance Embedded Random Vector Functional Link Network."* International Conference on Neural Information Processing (ICONIP 2020).
- A contributed talk on "*Ensemble Classifiers: A novel approach for classification problems*" at International Conference on Computational Mathematics in Nanoelectronics and Astrophysics (November, 2018) organized by Indian Institute of Technology Indore.