

Hussain Ahmad Madni

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🎓 Hussain Ahmad Madni

🌐 Homepage

🌐 hussain-ahmad

Research Interest

I am interested in addressing data and model heterogeneity challenges in cross-domain learning, with a focus on medical imaging and semantic segmentation. My research centers on advanced deep learning methods for medical image analysis, particularly segmentation and disease classification. Ultimately, I aim to develop robust AI-driven diagnostic tools to support clinical decision-making in healthcare.

Education

- 2022 – 2024 **PhD**, Computer Science and Artificial Intelligence, University of Udine, Italy.
Research Topic: *Data and Model Privacy in Cloud Computing using Federated Learning*.
- 2017 – 2018 **MS**, Computer Science, COMSATS University Islamabad, Pakistan.
Thesis title: *Intrusion Detection System Using Deep Learning*.
- 2010 – 2014 **BSc**, Computer System Engineering, The Islamia University of Bahawalpur, Pakistan.
Thesis title: *Targeted Malicious Email Detection using Machine Learning*.
- 2008 – 2010 **Intermediate (FSc Pre-Engineering)**, BISE, D. G. Khan, Pakistan.
Main Courses: *Mathematics, Physics, Chemistry, and English*.
- 2005 – 2007 **Matriculation (Science)**, BISE, D. G. Khan, Pakistan.
Main Courses: *Mathematics, Physics, Chemistry, Biology, and English*.





Professional Experience

- 2025 **Postdoctoral Researcher** University of Udine, Italy.
- 2019 – 2021 **Research Assistant** COMSATS University Islamabad, Pakistan.
- 2015 – 2019 **Software Engineer** Integrated Dynamic Solutions (IDS), Rawalpindi, Pakistan.




Research Publications

Journal Articles






- H. A. Madni**, H. Shujat, A. De Nardin, S. Zottin, and G. L. Foresti, "Unsupervised brain mri anomaly detection via inter-realization channels," *International Journal of Neural Systems*, 2025. [DOI: 10.1142/S0129065725500479](#).
- H. A. Madni**, R. M. Umer, S. Zottin, C. Marr, and G. L. Foresti, "Fl-w3s: Cross-domain federated learning for weakly supervised semantic segmentation of white blood cells," *International Journal of Medical Informatics*, p. 105 806, 2025. [DOI: 10.1016/j.ijmedinf.2025.105806](#).
- H. A. Madni**, R. M. Umer, and G. L. Foresti, "Exploiting data diversity in multi-domain federated learning," *Machine Learning: Science and Technology*, vol. 5, no. 2, p. 025 041, 2024. [DOI: 10.1088/2632-2153/ad4768](#).
- H. A. Madni**, R. M. Umer, and G. L. Foresti, "Robust federated learning for heterogeneous model and data," *International Journal of Neural Systems*, 2024. [DOI: 10.1142/S0129065724500199](#).
- H. A. Madni**, R. M. Umer, and G. L. Foresti, "Blockchain-based swarm learning for the mitigation of gradient leakage in federated learning," *IEEE Access*, vol. 11, pp. 16 549–16 556, 2023. [DOI: 10.1109/ACCESS.2023.3246126](#).
- H. A. Madni**, R. M. Umer, and G. L. Foresti, "Swarm-fhe: Fully homomorphic encryption based swarm learning for malicious clients," *International Journal of Neural Systems*, 2023. [DOI: 10.1142/S0129065723500338](#).

- 7 F. Abdullah, R. Imtiaz, **H. A. Madni**, *et al.*, “A review on glaucoma disease detection using computerized techniques,” *IEEE Access*, vol. 9, pp. 37 311–37 333, 2021.  DOI: 10.1109/ACCESS.2021.3061451.
- 8 K. Naveed, F. Abdullah, **H. A. Madni**, M. A. Khan, T. M. Khan, and S. S. Naqvi, “Towards automated eye diagnosis: An improved retinal vessel segmentation framework using ensemble block matching 3d filter,” *Diagnostics*, vol. 11, no. 1, 2021, ISSN: 2075-4418.  DOI: 10.3390/diagnostics11010114.
- 9 M. Raza, K. Naveed, A. Akram, *et al.*, “Davs-net: Dense aggregation vessel segmentation network for retinal vasculature detection in fundus images,” *Plos one*, vol. 16, no. 12, eo261698, 2021.  DOI: 10.1371/journal.pone.0261698.
- 10 M. Tabassum, T. M. Khan, M. Arsalan, *et al.*, “Cded-net: Joint segmentation of optic disc and optic cup for glaucoma screening,” *IEEE Access*, vol. 8, pp. 102 733–102 747, 2020.  DOI: 10.1109/ACCESS.2020.2998635.

Conference Proceedings

- 1 **H. A. Madni**, R. M. Umer, and G. L. Foresti, “Federated learning for data and model heterogeneity in medical imaging,” in *International Conference on Image Analysis and Processing*, Springer, 2023, pp. 167–178.  DOI: 10.1007/978-3-031-51026-7_15.
- 2 A. Ahmed, A. Manzoor, A. Khan, *et al.*, “Performance measurement of energy management controller using heuristic techniques,” in *Complex, Intelligent, and Software Intensive Systems: Proceedings of the 11th International Conference on Complex, Intelligent, and Software Intensive Systems (CISIS-2017)*, Springer, 2018, pp. 181–188.  DOI: 10.1007/978-3-319-61566-0_17.
- 3 **H. A. Madni**, Z. Anwar, and M. A. Shah, “Data mining techniques and applications — a decade review,” in *2017 23rd International Conference on Automation and Computing (ICAC)*, 2017, pp. 1–7.  DOI: 10.23919/IconAC.2017.8082090.




Skills

Languages	 English, Urdu.
Coding	 Python, Java, C++, PHP, SQL, ...
Databases	 Oracle, MySQL, PostgreSQL.
Web Dev	 HTML, CSS, JavaScript, Apache Web Server, Tomcat Web Server.
Misc.	 Academic research, teaching, training, \LaTeX typesetting and publishing.

Certification

- 2024  **Oxford Machine Learning Summer School**, Oxford, UK.
- 2023  **International Computer Vision Summer School (ICVSS2023)**, Sicily, Italy.
- 2022  **International Summer School on Artificial Intelligence**, University of Udine, Italy.
- 2014  **Professional Software Development**, Aptech Education, Pakistan.

Awards and Achievements

- 2021  **MIUR, Italy Scholarship** for PhD in Computer Science and Artificial Intelligence.
- 2017  **PEEF, Pakistan Scholarship** for a Master’s in Computer Science.
- 2011  **Merit Scholarship**, ICT R&D Fund, Pakistan for Bachelor in Computer System Engineering.