

Hussain Ahmad Madni, Ph.D Scholar

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🌐 <https://h-ahmad.github.io/>

🌐 [hussain-ahmad](#)

Research Interest

I am currently working on Distributed Machine Learning and Deep Learning, especially Federated Learning and Swarm Learning for the security and privacy of data and models. My research interest includes Machine Learning, Deep Learning, Federated Learning, Swarm Learning, Cybersecurity, and Cloud-Computing Trust.

Education

- 2022 – 2024 **Ph.D.**, Department of Computer Science and Artificial Intelligence, University of Udine, Italy.
Research Topic: *Trust in Cloud Computing*.
- 2017 – 2018 **MS.**, Department of Computer Science, COMSATS University Islamabad, Pakistan.
Thesis title: *Introduction Detection System using Deep Learning*.
- 2010 – 2014 **B.Sc. Computer System Engineering** The Islamia University of Bahawalpur, Pakistan.
Thesis title: *Targeted Malicious Email Detection using Machine Learning*.
- 2008 – 2010 **Intermediate (F.Sc. Pre-Engineering)** Board of Intermediate and Secondary Education, D. G. Khan, Pakistan.
Main Courses: *Mathematics, Physics, English, Chemistry*.
- 2005 – 2007 **Matriculation (Science)** Board of Intermediate and Secondary Education, D. G. Khan, Pakistan.
Main Courses: *Mathematics, Physics, English, Chemistry, Biology*.

Professional Experience

- 2025 **Postdoctoral Researcher** University of Udine, Italy.
- 2019 – 2021 **Research Assistant** COMSATS University Islamabad, Pakistan.
- 2018 – 2019 **Sr. Software Engineer** SK Technologies, Islamabad, Pakistan.
- 2015 – 2017 **Software Engineer** Integrated Dynamic Solutions (IDS), Rawalpindi, Pakistan.

Research Publications

Journal Articles

- H. A. Madni**, R. M. Umer, S. Zottin, C. Marr, and G. L. Foresti, "FI-w3s: Cross-domain federated learning for weakly supervised semantic segmentation of white blood cells," *International Journal of Medical Informatics*, p. 105 806, 2025.
- 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.

- 6 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](#).
- 7 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](#).
- 8 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, e0261698, 2021. [DOI: 10.1371/journal.pone.0261698](#).
- 9 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/ICoAC.2017.8082090](#).

Skills

Languages	📖 English, Urdu.
Coding	📖 Python, \LaTeX , 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 Ph.D. in Computer Science.
- 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.