Hussain Ahmad Madni, Ph.D Scholar

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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 – continue **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

2019 – 2021 **Research Assistant** COMSATS University Islamabad, Pakistan.

2015 – 2021 **Software Engineer** CSD, Ministry of Defense, Pakistan.

Research Publications

Journal Articles

1. **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.

2. **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.

3. 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.

4. 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.

5. 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.

6. 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 *ICIAP2023 Workshop on Federated Learning in Medical Imaging and Vision*, 2023. URL: https://arxiv.org/abs/2308.00155.
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*, L. Barolli and O. Terzo, Eds., Cham: Springer International Publishing, 2018, pp. 181–188, ISBN: 978-3-319-61566-0.
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, 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

2014 **Professional Software Development**. Aptech Education.

2022 **International Summer School on Artificial Intelligence**. University of Udine, Italy.

Awards and Achievements

2011 **Merit Scholarship**, ICT R&D Fund, Pakistan for B.Sc Computer System Engineering.

2017 **PEEF, Pakistan Scholarship** for MS Computer Science.

2021 **MIUR, Italy Scholarship** for PhD Computer Science.