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Sadam Hussain

Education

2021–2025 **Ph.D. in Computer Sciences**, *Tecnológico de Monterrey*, Mexico
My doctoral research integrated deep learning and natural language processing techniques to advance computer-aided diagnosis systems, with a core focus on health informatics applications. I developed novel methods for combining medical imaging and textual data to improve diagnostic accuracy and decision support for healthcare providers. This interdisciplinary work contributed to bridging AI technologies with practical health information systems, and was published in leading venues.

2023–2024 **Visiting Scholar**, *University of Victoria*, Canada
Conducted research in health informatics, applying computer vision and natural language processing techniques to enhance healthcare data analysis and support clinical decision-making.

2018–2020 **MPhil in Computer Sciences**, *Shah Abdul Latif University*, Pakistan
Investigated large-scale functional connectivity patterns in the brain using fMRI data to better understand neural network interactions. Applied advanced data analysis techniques to characterize brain organization and its implications for cognitive function.

2012–2013 **MSc in Computer Sciences**, *University of Sindh*, Pakistan
Designed and developed a comprehensive database management system for a bookshop, focusing on efficient data storage, retrieval, and management to streamline inventory and sales operations.

2008–2010 **BSc in Mathematics**, *Shah Abdul Latif University*, Pakistan

Experience

Research

2021–2025 **Research Assistant**, *Tecnológico de Monterrey*, Mexico
Conducted research on breast cancer diagnosis and prognosis, developing multimodal AI models integrating medical imaging and clinical data.

2023–2024 **Research Assistant**, *University of Victoria*, Victoria, Canada
Conducted research on a systematic review and multimodal AI applications in healthcare under the supervision of Prof. Aaron Gulliver.

Teaching

2022-2025 **Teaching Assistant**, *Tecnológico de Monterrey*, Mexico
- Supported the delivery of the "Medical Image Analysis" course by preparing instructional materials and assisting in lectures and labs.
- Guided students on assignments and projects, providing feedback to enhance understanding of computer vision and AI applications in healthcare.

Fall-2022 **Lecturer**, *Tecnológico de Monterrey*, Mexico
- Taught "Medical Image Analysis" to undergraduate students.

2017–2021 **Lecturer (Computer Science)**, *Shaikh Ayaz University*, Pakistan
- Taught courses: Artificial Intelligence, Data Structures & Algorithms, Automata Theory.
- Supervised final-year projects and student research.
- Contributed to curriculum design and academic events.

2015–2016 **Lab Demonstrator/Instructor**, *Sukkur IBA University*, Pakistan
- Taught Artificial Intelligence, Data Structures, and Automata Theory.
- Designed practical lab sessions to reinforce theory.
- Graded assignments and provided constructive feedback.
- Assisted in course and curriculum development.

Industry

2016–2017 **Monitoring Assistant**, *School Education & Literacy Dept.*, Sindh, Pakistan
- Installed, configured, and maintained hardware/software for biometric authentication.
- Managed biometric records, ensuring data integrity.
- Synchronized biometric data with central data center systems.

Publications

2026. **Hussain, S.**, et al. ***The largest validation of the Mirai model for 5-year breast cancer risk prediction in Mexican women***. *Image Perception, Observer Performance, and Technology Assessment Conference, SPIE Medical Imaging 2026*.

2026. de Ávila Armenta, E., **Hussain, S.**, et al. ***Caption-based Alzheimer and mild cognitive impairment diagnosis at baseline using hybrid and transformer-based models***. *Computer-Aided Diagnosis Conference, SPIE Medical Imaging 2026*.

2026. Garza Abdala, J. A., **Hussain, S.**, et al. ***Simultaneous dual-view mammogram synthesis using denoising diffusion probabilistic models***. *Image Processing Conference, SPIE Medical Imaging 2026*.

2025. Siddiqui, A. G., Ghulamani, S., **Hussain, S.**. ***A Comparative Analysis of Text Sentiment Analysis Algorithms using Social Media Tweets***. *Pakistan Journal of Engineering & Technology (PAKJET)*, 8(3), 10–18.

2025. Ahmed, M., **Hussain, S.**, et al. ***Summarizing Recent Developments on Autism Spectrum Disorder Detection and Classification Through Machine Learning and Deep Learning Techniques***. *Applied Sciences (2076-3417)*, 15(14).

2025. de Ávila Armenta, E., Bosques-Palomo, B., **Hussain, S.**, et al. ***A ConvNeXt-Transformer Approach for Automated Conclusion Generation from Mammography***. *Authorea Preprints*.

2025. Pirzado, F. A., Ahmed, A., **Hussain, S.**, et al. ***Assessing Computational Thinking in Engineering and Computer Science Students: A Multi-Method Approach***. *Education Sciences*, 15(3), 344.

2025. Naseem, U., Zhang, Q., Hu, L., **Hussain, S.**, et al. ***Knowledge Enhanced Language Model for Biomedical Natural Language Processing: Introducing a New Language Model for BioNLP***. *IEEE Systems, Man, and Cybernetics Magazine*, 11(1), 89–94.

2024. **Hussain, S.**, Ali, M., et al. ***Multiview Multimodal Feature Fusion for Breast Cancer Classification Using Deep Learning***. *IEEE Access*.

2024. **Hussain, S.**, Ali, M., et al. ***Comparative Analysis of Deep Learning Models for Breast Cancer Classification on Multimodal Data***. In *Proceedings of the First International Workshop on Vision-Language Models for Biomedical Applications*, 31–39.

2024. **Hussain, S.**, Naseem, U., et al. ***TECRR: a benchmark dataset of radiological reports for BI-RADS classification with machine learning, deep learning, and large language model baselines***. *BMC Medical Informatics and Decision Making*, 24(1), 310.

2024. **Hussain, S.**, Ali, M., et al. ***Performance evaluation of deep learning and transformer models using multimodal data for breast cancer classification***. In *MICCAI Workshop on Cancer Prevention through Early Detection*, 59–69.

2024. **Hussain, S.**, Ali, M., et al. ***Breast cancer risk prediction using machine learning: a systematic review***. *Frontiers in Oncology*, 14, 1343627.

2023. **Hussain, S.**, Lafarga-Osuna, Y., et al. ***Deep learning, radiomics and radiogenomics applications in digital breast tomosynthesis: a systematic review***. *BMC Bioinformatics*, 24(1), 401.

2021. Jatoi, M. A., Dharejo, F. A., **Hussain, S.**. ***Comparison of machine learning techniques based brain source localization using EEG signals***. *Current Medical Imaging*, 17(1), 64–72.

2020. Jatoi, M. A., Kamel, N., **Hussain, S.**. ***Trend analysis for brain source localization techniques using EEG signals***. In *2020 3rd International Conference on Computing, Mathematics and Engineering Technologies (iCoMET)*, 1–5. IEEE.

Summer Schools and Conferences

2024 **Mexican NLP Summer School (NAACL)**, *Participated in the NAACL-affiliated summer school focused on Natural Language Processing, held in Mexico.*

2024 **MICCAI 2024 – Workshop on Cancer Prevention through Early Detection**, *Presented research on deep learning and multimodal methods for early breast cancer detection at MICCAI Workshop, Morocco.*

2024 **ACM Multimedia 2024 (ACM-MM)**, *Presented at a workshop on vision-language models during the ACM Multimedia Conference, Australia.*

Honours and Awards

2021–2025 **Doctoral Research Fellowship:** Awarded by CONACYT (Mexico) to support doctoral research in computer science, recognizing academic excellence and research potential.

2021–2025 **Full Tuition Scholarship:** Granted by Tecnológico de Monterrey to cover full tuition costs for doctoral studies, based on outstanding academic merit.

2014 **Best Student Award:** Vice Chancellor's Silver Medal for achieving the highest academic performance in MSc Computer Sciences class of 2014, University of Sindh.

Courses

UVic

- HINF 574 (*Modelling and Simulation in Health Care*)
- HINF 503 (*Research Methods in Health Informatics and Digital Health*)
- HINF 572 (*Health Informatics Overview*)

Coursera

- AI for Medicine Specialization by *DeepLearning.AI*
- Health Informatics Specialization by *Johns Hopkins University*

Peer Review Service

- npj Digital Medicine
- BMC Medical Informatics and Decision Making
- BMC Medical Imaging
- Scientific Reports
- European Journal of Medical Research
- BMC Cancer
- Cancer Causes & Control
- Discover Oncology

Programming Competencies

Languages Python, Java, MATLAB

Libraries PyTorch, TensorFlow, Keras, NumPy, scikit-learn, XGBoost, pandas, OpenCV, NLTK, WEKA