

# 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.

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## Publications

- **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 Avila 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 the 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.

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## 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.

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## 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.

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## 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*

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## 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

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## Programming Competencies

Languages Python, Java, MATLAB

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