# Uzair Shah

*Curriculum Vitae*

## SUMMARY

Experienced Data Scientist with over 5 years of comprehensive expertise in machine learning, deep learning, and health informatics. Currently pursuing a Ph.D. in Computer Science and Engineering, specializing in AI applications in biomedicine. Proven track record of applying predictive modeling and statistical analysis to complex biomedical data sets, as demonstrated through multiple peer-reviewed publications and collaborative projects with medical institutions.

## PERSONAL DETAILS

*Email:* uzairshahmdn@gmail.com; *Mob:* +97450520287; Google Scholar; GitHub; LinkedIn

## RESEARCH INTERESTS

Machine Learning, Deep Learning, Natural Language Processing, Health Informatics

## EDUCATION

| **Degree** | **Institute** | **Year** |
|---|---|---|
| Ph.D. in Computer Science and Engineering | HBKU, Qatar | 2022-Present |
| Master of Data Analytics | HBKU, Qatar | 2020-2022 |
| Bachelor of Computer Science | AWKUM, Pakistan | 2015-2019 |

## KEY SKILLS

- **Programming Languages**: Python, R, SQL, Java
- **Machine Learning/Deep Learning**: TensorFlow, PyTorch, Keras, Scikit-Learn
- **Data Analysis Tools**: Pandas, Numpy, Matplotlib
- **Cloud Computing**: AWS, Azure, Google Cloud
- **Other Skills**: MS Office Suite, Network Automation (Netmiko, telnetlib), Version Control (Git)

## PRESENTATIONS

- **U. Shah**, M.R. Biswas, K. MM Dolaat, M. Househ, Z. Shah, T. Alam "Vaccine Rollout and Sentiment Shift in Twitter Population: A Surveillance Study". Paper presented at IMIA MedInfo 21 Conference. (Link)
- **U. Shah**, M.R. Biswas, M.S. Alzubaidi, H. Ali, T. Alam, M. Housed, Z. Shah "Recent Developments in Artificial Intelligence-based Techniques for Prostate Cancer Detection: A Scoping Review". Paper presented at 18Th ICIMTH 2020 Greece. (Link)
- **U. Shah**, "Vision Transformers for 3D Analysis and Reconstruction". Selected presentation at the Joint Workshop between Tsinghua University and Hamad Bin Khalifa University (HBKU). One of two student representatives chosen from HBKU to present research to the visiting Tsinghua University delegation.

## EXPERIENCE

**Teaching Assistant (Jan 2025 - May 2025)**
Led lab sessions and provided mentorship for "Principles of Health Informatics" course, supporting students with technical guidance and assessment.

**Teaching Assistant (Sep 2023 - Dec 2023)**

Facilitated hands-on programming labs for "Introduction to Python" course, creating supplemental learning materials that enhanced student project outcomes.

**Research Assistant (Oct 2022 - Dec 2022)**
Developed and refined computer vision models for Emotion Sensing and Recognition App (ESRA) under Innovation Grant funding.

**Teaching Assistant (Sep 2021 - Dec 2021)**

Provided instructional support for "Principles of Health Informatics" course, creating assessment materials and conducting tutorial sessions for students.

**KAUST Research Intern (July 2024)**
Selected for prestigious Visiting Student Research Program, developing advanced segmentation algorithms for Electronic Microscopy imaging applications.

**Data Scientist Intern (May 2023 - July 2023)**
Developed evaluation metrics and benchmarking frameworks for Large Language Models (LLMs) at PanData (Doha), enhancing model performance assessment and optimization.

**Lead Technician (Oct 2021 - Aug 2022)**
Managed technical operations and network optimization at Ooredoo Qatar, leading a team of technicians and improving service resolution efficiency.

**Freelance Developer (2018 - 2019)** (Portfolio)
Successfully delivered multiple data analysis and web development projects for international clients, maintaining excellent ratings and high client satisfaction.

## SELECTED PUBLICATION

**Journals**

- **U. Shah**, M. Alzubaidi, M. AGUS, C. Calí, P. J. Magistretti, M. Househ "Deep Learning for Brain Electron Microscopy Segmentation: Advances, Challenges, and Future Directions in Connectomics and Ultrastructure Analysis" Submitted to $15^{th}$ Eurographics Workshop on Visual Computing for Biology and Medicine.
- **U. Shah**, M. AGUS, D. Boges, H. Aldous, v. Chiappini, M. Alzubaidi, J. Schneider, M. Hadwiger, P. J. Magistretti, M. Househ, C. Calí "AI-Guided Immersive Exploration of Brain Ultrastructure for collaborative analysis and education" In Journal of Computers & Graphics [**IF:2.5**]
- **U. Shah**, M. Alzubaidi, F. Moshen, T. Alam, M. Househ "Ensemble-Based Feature Engineering Mechanism to Decode Imagined Speech from Brain Signals." In Informatics in Medicine Unlocked.
- **U. Shah**, M. Alzubaidi, F. Moshen, A.A. Abd-Alrazaq, T. Alam, M. Househ "The Role of Artificial Intelligence in Decoding Speech from EEG Signals: A Scoping Review". In Sensors [**IF: 3.4**]
- **U. Shah**, A.A. Abd-Alrazaq, J. Schneider, M. Househ, Z. Shah. "Tweeters' Concerns and Opinions about the COVID-19 Booster Shots: Infoveillance Study". Journal of Consumer Health on the Internet.
- **U. Shah**, M.R. Biswas, R. Ali, H. Ali, Z. Shah "Public Attitudes Towards Vaccination Before and After the COVID -19 Pandemic". Human Vaccines & Immunotherapeutics journal. [**IF: 4.1**]

**Conferences**

- **U. Shah**, M. AGUS, D. Boges, v. Chiappini, M. Alzubaidi, J. Schneider, M. Hadwiger, P. J. Magistretti, M. Househ, C. Calí "SAM4EM: Efficient memory-based two stage prompt-free segment anything model adapter for complex 3D neuroscience electron microscopy stacks" accepted at $10^{th}$ IEEE Workshop on Computer Vision for Microscopy Image Analysis **CVPRW2025**.

- G. Pintore, **U. Shah**, M. Agus, E. Gobbetti "NadirFloorNet: reconstructing multi-room floorplans from a small set of registered panoramic images" accepted at $2nd$ Workshop on Urban Scene Modeling: Where Vision Meets Photogrammetry and Graphics **CVPRW2025**.

- **U. Shah**, M. Alzubaidi, E. Al-Amri, M. AGUS, M. Househ "FADA: Fetal Accurate Detection AI for Automated Ultrasound Image Analysis and Reporting" accepted at $20^{th}$ World Congress on Medical and Health Informatics **Medinfo2025**.

- **U. Shah**, N. Khan, M. Alzubaidi, M. AGUS, M. Househ "ArtInsight: A Multimodal AI Framework for Interpreting Children's Drawings and Enhancing Emotional Understanding" accepted at the $35^{th}$ Medical Informatics Europe Conference **MIE2025**.

- **U. Shah**, S. Jashari, M. Tukur, G. Pintore, E. Gobbetti, J. Schneider, M. Agus "VISPI: Virtual Staging Pipeline for Single Indoor Panoramic Images" accepted at the Smart Tools and Applications in Graphics 2024 **STAG2024** (**Best Paper Award** ⭐).

- **U. Shah**, M.R Biswas, M. AGUS, M. Househ, W. Zaghouani "MemeMind at ArAIEval Shared Task: Generative Augmentation and Feature Fusion for Multimodal Propaganda Detection in Arabic Memes through Advanced Language and Vision Models" accepted at the 2nd Arabic Natural Language Processing Conference **ArabicNLP2024**.

- **U. Shah**, S. Khan, M. Alzubaidi, M. AGUS, M. Househ "ArtInsight: A Multimodal AI Framework for Interpreting Children's Drawings and Enhancing Emotional Understanding" accepted at the $34^{th}$ Medical Informatics Europe Conference **MIE2024**.

- **U. Shah**, M. Tukur, M.S. Alzubaidi, G. Pintore, E. Gobbetti, M. Househ, J. Schneider, M. Agus "MultiPanoWise: holistic deep architecture for multi-task dense prediction from a single panoramic image" accepted at Omnidirectional Computer Vision 5th Workshop **CVPRW2024**.

- **U. Shah**, J. Schneider, E. Gobbetti, G. Pintore, M.S. Alzubaidi, M. Househ, M. Agus "EleViT: exploiting element-wise products for designing efficient and lightweight vision transformers" accepted at the 3rd Workshop on Transformers for Vision (T4V) **CVPRW2024**.

- **U. Shah**, H. Ali, T. Alam, M. Househ, Z. Shah "Artificial Intelligence-Based Models for Predicting Vaccines Critical Tweets: An Experimental Study". Stud Health Technol Inform. 2022 Jun 29;295:209-212. doi: 10.3233/SHTI220699. PMID: 35773845.

- **U. Shah**, M.R. Biswas, K. MM Dolaat, M. Househ, Z. Shah, T. Alam "Vaccine Rollout and Shift in Public Sentiment: Twitter-Based Surveillance Study". Stud Health Technol Inform. 2022 Jun 6;290:704-708. doi: 10.3233/SHTI220169. PMID:35673108.

- **U. Shah**, M. R Biswas, M. S. Alzubaidi, H. Ali, T. Alam, M. Housed, Z. Shah "The Role of AI in the diagnosis of Prostate Cancer: A Scoping Review" Stud Health Technol Inform. 2022 Jan 14;289:268-271. doi: 10.3233/SHTI210911. PMID: 35062144.

- **U. Shah**, A.A. Alrazeq, T. Alam, M. Househ, Z. Shah, "An Efficient Method to Predict Pneumonia from Chest X-rays using Deep Learning Approach" $18^{\text{th}}$ International Conference on **ICIMTH 2020** Greece.

## PROJECTS WITH PUBLICLY AVAILABLE CODES

- **SAM4EM: Efficient Segmentation for Neural Structures in Electron Microscopy** (GitHub)
  - Developed a novel approach for 3D segmentation of complex neural structures using Segment Anything Model (SAM) with advanced fine-tuning strategies
  - Created a prompt-free adapter for SAM using two-stage mask decoding to automatically generate prompt embeddings
  - Implemented a 3D memory attention mechanism ensuring segmentation consistency across 3D stacks
  - Released a unique benchmark dataset for segmentation of astrocytic processes and synapses
- **MultiPanoWise: Holistic Deep Architecture for Multi-Task Dense Prediction** (GitHub)
  - Extended vision transformers to jointly infer multiple pixel-wise signals from a single indoor panoramic image
  - Designed a novel context adjustment approach to enforce knowledge distillation between various signals
  - Introduced an augmented Chebychev/hypervolume loss scalarization method for multi-task learning
  - Achieved state-of-the-art performance on joint extraction of heterogeneous signals from panoramic images
- **Multimodal Deep Learning for Diabetic Retinopathy Grading** (GitHub)
  - Presented a novel approach enhancing DR grading by integrating linear-Radon sinogram-based images with retinal fundus images
  - Demonstrated significant improvements in multi-class classification performance compared to unimodal retina-only images
  - Validated the effectiveness of Radon Transform through comprehensive experiments with multiple CNN architectures
  - Designed a system capable of detecting subtle patterns among different DR grades
- **Ensemble-Based Feature Engineering for Imagined Speech Decoding** (GitHub)
  - Developed an ensemble-based feature engineering mechanism to identify optimal brain rhythms, feature sets, and channel subsets
  - Created an artificial intelligence tool to decode imagined speech from brain signals
  - Trained and evaluated various machine learning algorithms for classification performance
  - Submitted method and results for journal publication
- **AI Models for Predicting Vaccine-Critical Tweets** (GitHub)
  - Created a robust classifier for identifying and predicting vaccine-critical social media content
  - Implemented and compared various machine learning and deep learning algorithms
  - Presented methods and results at a conference
- **Health News Credibility Classification** (GitHub)
  - Developed methods to assess the credibility of health news pages shared on social media
  - Trained machine learning algorithms using the H2O library for accurate credibility estimation

  - Presented findings and methodology at a conference

- **Pneumonia Diagnosis from Chest X-rays Using CNN** (Kaggle)
  - Designed a custom VGG16-based convolutional neural network for pneumonia classification
  - Achieved 96% test accuracy despite dataset noise and variability
  - Implemented effective data augmentation techniques to improve model generalization
  - Presented method and results at a conference

## AWARDS

| **Year** | **Detail** |
|---|---|
| 2023 | Won third place in the **Al-Fikra National Entrepreneurship Competition** organized by Qatar University and Qatar Development Bank and provided **50K** of incubation. |
| 2022 | Won first place in **CodeCamp**, a hackathon organized by the Digital Incubation Center under the patronage of the Ministry of Communication and Information Technology and provided incubation at DIC for 2 years. |
| 2022 | HBKU Merit-based scholarship For PhD. |
| 2020 | HBKU Merit-based scholarship For MS. |
| 2017 | Awarded a laptop (Prime Minister laptop scheme phase III). |

## REFERENCES

| | |
|---|---|
| Prof. Mowafa Househ | **Position**: Full Professor, College of Science and Engineering, Hamad Bin Khalifa University, Doha, Qatar |
| Dr. Marco Agus | **Position**: Assistant Professor, College of Science and Engineering, Hamad Bin Khalifa University, Doha, Qatar |