Hasan Shaikh

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Research Interests:
Radiomics | Auto-segmentation | LLM
Adaptive-Radiotherapy | AI & ML
Deep Learning | Radiation Oncology

LinkedIn: linkedin.com/in/hasan
GitHub: github.com/hash123shaikh
Portfolio: hash123shaikh.github.io
Scholar: Google Scholar Profile

Work Experience

Quantitative Imaging Research and Artificial Intelligence Lab (QIRAIL) — Tamil Nadu, India
Data Scientist, *Christian Medical College (CMC) Vellore, Dept. of Radiation Oncology* — *Aug. 2024 – Present*

[P1] Radiomics-Based Risk Stratification in Head and Neck Cancer

- Developed machine learning models for predicting locoregional recurrence in **151 HNC patients** using CT-based radiomics and clinical data.
- Benchmarked multiple classifiers (Logistic Regression, SVM, Random Forest) and **8 metaheuristic feature selectors** (e.g., Particle Swarm Optimization (PSO), Genetic Algorithm (GA), LASSO, Grey Wolf Optimizer (GWO)) for robust biomarker discovery.
- Designed an **end-to-end radiomics pipeline**: DICOM retrieval (Orthanc), GTV-P segmentation (Citric), PyRadiomics-based extraction, enabling reproducible model training.

[P2] CHAVI: CompreHensive Digital ArchiVe of Cancer Imaging –India's First National Oncology Imaging Biobank

- Contributed to CHAVI, a national biobank led by Tata Memorial Centre and IIT Kharagpur.
- Curated and uploaded **304+ anonymized HNC cases** with validated clinical/imaging metadata.
- Built **automated pipelines** ensuring compliance with **FAIR principles (Findable, Accessible, Interoperable, and Reusable)** and interoperability for multi-institutional research.

[P3] Automated Segmentation of Head and Neck Cancer from CT Images Using 3D Convolutional Neural Networks (Collaboration with NIT Surathkal, India)

- Co-developed a 3D nnU-Net-based model to segment head and neck tumors in CT data (**136 cases**: 106 Maastricht + 30 CMC).
- Demonstrated **domain shift**: DSC = 0.76 (Maastricht), 0.63 (CMC), 0.72 (combined)—highlighting the need for regional adaptation in model training.

[P4] Data Infrastructure for Prospective Imaging Trials

- Managed imaging + clinical data collection, annotation, and QA for ongoing prospective trials.
- Implemented automated AWS S3 backups for secure cloud storage and disaster recovery.
- Drafted the **NVIDIA Academic Grant Proposal**, justifying infrastructure for in-house deployment of large-scale deep learning models in clinical settings.

STARlab Capital — Lucknow, India
Research Analyst — *Dec. 2023 – June 2024*

- Designed, backtested, and deployed volatility-based strategies (e.g., Nebula, ARUT, A2) using **OptionNet Explorer, Mesosim, OptiTrade, OptiBot** tools.
- Enhanced the ARUT strategy, increasing ROI by **52.38%** through scenario-driven optimization and real-time feedback.
- Refined internal platforms: improved trade logs, added dynamic filters, and led contributions to OptiTrade's open-source GitHub repo.

Education

Master of Technology in Computer Engineering — Nov. 2021 – Nov. 2023
Aligarh Muslim University (AMU), ***CGPA: 8.80 / 10.00*** — *Aligarh, India*

Bachelor of Technology in Computer Science and Engineering — Aug. 2017 – Jul. 2021
Dr. A.P.J. Abdul Kalam Technical University (AKTU), ***CGPA: 8.04 / 10.00*** — *Lucknow, India*

Technical Skills

Programming Languages	: Python, Java, SQL (Postgres), HTML, CSS
Frameworks	: TensorFlow, PyTorch, Keras, Flask
Tools & Platforms	: Docker, Orthanc PACS, REST API, XNAT, Git, GitHub Actions, CTP, 3D Slicer
Data Science & ML	: Radiomics, Feature Selection, Predictive Modelling, Deep Learning
Other Skills	: Data Management, S3 Bucket, SQL, Bash, YAML, JSON, XML
Collaboration	: Project Management, Cross-Functional Collaboration, CI-CD Pipelines

Projects

Multimodal Data Analytics for Predicting the Survival of Cancer Patients — Aligarh, India
Advisor: Prof. Rashid Ali, Aligarh Muslim University (Thesis) — *Aug. 2022 – Nov. 2023*

- Implement a deep learning architecture, **Multimodal Gated Attention Convolution Neural Network (MGAttC-NNMD)**, for cancer survival prediction using heterogeneous data types.
- Integrated clinical, gene expression, and copy number alteration data from the METABRICS dataset, achieving a prediction accuracy of **91.2%**.

Study of AI Tools & Techniques for Legal Text Processing — Aligarh, India
Advisor: Prof. Nesar Ahmad, Aligarh Muslim University — *Apr. 2022 – Jul. 2022*

- Explored AI-based approaches for improving the efficiency of legal document summarization and retrieval.
- Applied topic modeling using **Latent Dirichlet Allocation (LDA)** to identify key topics within lengthy legal texts.
- Built an abstractive summarization tool to generate concise summaries of legal documents, enhancing decision-making for legal professionals.

Publications

Hasan Shaikh and Rashid Ali, *"Cancer Survival Prediction Using Artificial Intelligence: Current Status and Future Prospects," Data Science in the Medical Field*, Academic Press, Elsevier, 2024. ISBN-13: 978-0-443-24029-4. DOI: 10.1016/B978-0-443-24028-7.00016-7

Hasan Shaikh, Amal Joseph Varghese, Hannah Mary Thomas T et al., *"Can CT Radiomics Predict Recurrence in Head and Neck Cancer? Early Results from a Prospective Imaging Trial,"* 14th Research Day at Christian Medical College, Vellore, Tamil Nadu, India, 2024. [Poster Presentation]

Piyus Prabhanjans, Hannah Mary Thomas T, Hasan Shaikh, Jeny Rajan, et al., *"Automated Segmentation of Head and Neck Cancer from CT Images Using 3D Convolutional Neural Networks," Healthcare Analytics*, 2025. [Under Review]

Hasan Shaikh and Rashid Ali, *"A Prognosis Prediction of Breast Cancer using Multimodal Gated Attention Convolution Neural Network by integrating Multi-dimensional Data (MGAttCNNMD)."* [Under Preparation]

Academic Achievements & Honors

Third Prize, Oral Presentation at the 2nd National Symposium on Health Data and AI (March 2025) – Presented *"Automated Segmentation of Head and Neck Cancer from CT Images Using 3D nnU-Net"* and was awarded by the BioMedical Informatics Unit, CMC Vellore.

Honors Degree awarded for exceptional academic performance, ranking in the top 1% out of 128 students in the undergraduate engineering program.

Completed NPTEL courses conducted by IITs (Elite + Silver Certified):

- Data Analytics with Python (80%) (Link)
- Essential Mathematics for Machine Learning
- Deep Learning
- Python for Data Science (78%) (Link)
- Machine Learning
- Demystifying the Brain (Link)

Workshop/Conference Attended

1. Participated and served as part of the Organizing Team for the **2nd Annual Winter Symposium on Health Data and AI**, conducted by Biomedical Informatics Unit, Christian Medical College (CMC) Vellore, Tamil Nadu, India (March 13–15, 2025). (Link)

2. Attended the Continuing Medical Education (CME) program on **Revolution and Precision in Radiation Oncology**, Ida B. Scudder Cancer Center, Christian Medical College (CMC) Vellore, Tamil Nadu, India (March 1, 2025). (Link)

3. Participated in the **14th Annual Research Day**, organized by the Office of Research, Christian Medical College (CMC) Vellore, Tamil Nadu, India (October 24–25, 2024). (Link)

4. **AI & ML for Engineering & Social Sciences Research**, 2023 IEEE Computational Intelligence Society (CIS) Summer School, organized by Malaviya National Institute of Technology Jaipur (MNIT) Jaipur, India, 4 – 8 Sep. 2023. (Link)

5. **7th Summer School on AI with Focus on Computer Vision & ML**, coordinated by International Institute of Information Technology (IIIT) Hyderabad, India, 1 – 31 Aug. 2023. (Link)

6. **Emerging Research Trends in Computational Intelligence Techniques to Address Challenges in Biomedical Data and Imaging**, 2022 IEEE CIS Summer School, organized by National Institute of Technology (NIT) Arunachal Pradesh, India, 7 – 11 Nov. 2022. (Link)