MD SHAHADAT HOSSEN SHUVO

+8801571361658 | shuvo.mpbme@gmail.com | Chandpur, Bangladesh
shahadat-shuvo.netlify.app | github.com/iamSHShUvo | linkedin.com/in/s-h-shuvo | ORCID: 0009-0004-5557-077X

RESEARCH INTERESTS

Quantitative Medical Imaging • Computational Modeling • Radiation Therapy • Explainable AI • Biomedical Instrumentation

RESEARCH EXPERIENCE

Research Assistant (Jan 2025 – Apr 2026)
Square Hospitals Ltd. & Ahsania Mission Cancer and General Hospital (AMCGH), Dhaka, Bangladesh

- Led a lung-cancer analytical study using multi-institutional clinical imaging data from two oncology centers in Dhaka, engineering a robust Python pipeline to audit and recover corrupted DICOM records, successfully restoring 92.5% of local cases across a 597-patient cohort from three institutions
- Extracted 107 IBSI-compliant radiomic and dosiomic features to evaluate cross-population generalizability between a public Dutch cohort (Maastro Clinic, Netherlands) and Dhaka clinical datasets using non-parametric statistics (Mann-Whitney U with FDR correction), PCA, and Random Forest models.
- Published thesis preprint on Zenodo (DOI: 10.5281/zenodo.20927951) and actively preparing the manuscript for peer-reviewed publication under the supervision of Dr. Md Anwarul Islam (Square Hospitals Ltd.), Prof. Dr. Md Jahangir Alam (Ahsania Mission Cancer and General Hospital), and Hozzatul Islam Sayed (Gono Bishwabidyalay).

Research Intern - Computational Oncology & Bioinformatics (Oct 2025 – Apr 2026)
Center for Bio-Health Research Bangladesh (CBHR) | Competitively Selected

- Synthesized 32 primary studies across 15+ cancer types to map oncogenic signaling axes (NuSAP1/Wnt, E2F1, glycolytic reprogramming) and immune-cell protective mechanisms of ANKRD22.
- Designed a structured TCGA pan-cancer computational analysis workflow spanning differential expression, survival modeling, immune infiltration, methylation, and pathway enrichment.

Project Lead - Low-Cost Surface EMG Biofeedback Device for Motor Rehabilitation (2025 – Present)
Biomedical Instrumentation & Signal Processing Project

- Designing and prototyping an accessible surface electromyography (sEMG) biofeedback system using Arduino Uno and surface electrodes to monitor muscle activation during post-surgical sciatica rehabilitation.
- Implemented real-time serial data acquisition firmware in embedded C and initiated digital noise-filtering and baseline-drift removal experiments in Python to isolate voluntary muscle bursts.

FEATURED OPEN-SOURCE SOFTWARE & RESEARCH REPOSITORIES

- **LUNG-RP-XAI:** Cross-population generalizability audit pipeline for lung-cancer radiomics and dosiomics across Western and South Asian cohorts (PyRadiomics, scikit-learn, SHAP; MIT License). Preprint: doi.org/10.5281/zenodo.20927951, Code: github.com/iamSHShUvo/LUNG-RP-XAI
- **domain-shift-audit:** Containerized web service auditing statistical domain shift between hospital feature cohorts using Mann-Whitney U tests, FDR correction, and automated transportability verdicts (Python, FastAPI, SQLite, Docker). Code: github.com/iamSHShUvo/domain-shift-audit

EDUCATION

Bachelor of Science in Medical Physics & Biomedical Engineering | Oct 2021 – Apr 2026
Gono Bishwabidyalay, Savar, Dhaka, Bangladesh | **CGPA: 3.63 / 4.00** (University Merit Scholarship Recipient)
Relevant Coursework: Radiation Oncology Physics · Radiation Treatment Planning · Radiation Dosimetry · Radiation Biology · Mathematics · Digital Signal & Image Processing · Biostatistics · Nuclear Medicine · Radiological Health & Safety

Higher Secondary Certificate (HSC): Savar Cantonment Public School & College (GPA: 4.33/5.00, 2019)

Secondary School Certificate (SSC): Savar Cantonment Board Boys High School (GPA: 5.00/5.00, Board Merit Scholarship, 2017)

ADVANCED COMPUTATIONAL & TECHNICAL TRAINING

- **ICTP Advanced School in Applied Machine Learning (SMR 4228):** ICTP (Trieste, Italy - Remote, July 2026): Covered uncertainty quantification, Bayesian deep learning, simulation-based inference, explainable AI, and model robustness.
- **Summer Course in Medical Physics & Quantitative Imaging:** Diponegoro University, Indonesia (23.3 Hrs, Cert. No: 81/UN7.F8/HK/VIII/2025, Aug 2025): CT physics, quantitative image quality metrics (MTF, NPS, SNR, CNR), computational phantoms, and spatial noise-reduction filtering (MF, AMF, BF, NLM).
- **2D to 3D External Beam Radiation Therapy (EBRT) Course:** Rayos Contra Cancer, USA (18 Didactic Hrs, Certified, Sep 2024 – Apr 2025): Clinical workflow, commissioning, CT simulation, treatment planning, and quality assurance.

PEER-REVIEWED PUBLICATIONS & SELECTED PRESENTATIONS

- **[Springer Book Chapter]** Rahman, M. M., Aktar, M. M., Rahman, M. H., Nayeem, S. T., Islam, M. K., Roy, T. K., Shuvo, M. S. H., Ali, M. R., Tanvir, G. S., & Soma, J. F. (2026). Innovative Shielding Techniques for Doorless Radiotherapy Bunkers: First Implementation at Gazi Medical College Hospital, Bangladesh. IFMBE Proceedings: IUPESM World Congress on Medical Physics and Biomedical Engineering XXVII, 383–390. Springer Nature Switzerland.
- **[Indexed Abstract]** Shuvo, M. S. H., Rifat, I. A., Supti, S. I., & Rahman, M. M. (2024). The Rise of Medical Physics in Bangladesh: An Evolving Field with a Promising Outlook. Physica Medica, 125 (Suppl. 1), 104152. Elsevier (5th European Congress of Medical Physics - ECMP 2024, Munich, Germany; ID: 771).
- **[Award-Winning Poster]** "Medical and Environmental Solid Waste Management: A Biotechnical Solution Aligned with UN SDGs" - Best Poster Award, 4th ICMPROI 2025 (BRAC University, Dhaka); presented at BUET ACS Chemovate (2024).
- **[Oral Presentation]** "Aspects of Medical Physics in Bangladesh: A Growing Field with a Bright Future" - 11th Annual Bangladesh Medical Physics Society Conference (2023).
- **[Poster Presentation]** "Dosimetric Comparison of Free Breathing VMAT and DIBH 3DCRT for Left-Side Breast Cancer" - Poster Presented, Research Fair 2024, Bose Centre for Advanced Study, University of Dhaka.

SELECTED HONOURS, LEADERSHIP & SCIENTIFIC SERVICE

- **2025:** Best Poster Presentation Award - 4th International Conference on Medical Physics in Radiation Oncology & Imaging (ICMPROI 2025), Dhaka.
- **2025:** Publishing Committee Member - ICMPROI 2025 (coordinated peer-review workflow and abstract curation for international proceedings).
- **2023:** National Finalist - 1st Biology & Bioinformatics Olympiad (top finalists among 3,000+ applicants, BioPC Bangladesh) & Quarter-Finalist, International Climate Science Olympiad.
- **2011–2026:** Academic Scholarships - University Merit Scholarship (Gono Bishwabidyalay, 2022–2026), SSC Board Merit Scholarship (2017), and Government Merit Scholarships (Junior School & Primary).

TECHNICAL & COMPUTATIONAL PROFICIENCIES

- **Clinical Research**: Radiomics, Dosiomics, Medical Imaging Analysis, Clinical Treatment Planning & QA Systems (IMRT/VMAT/3D-CRT, EPID, Ionisation Chamber Arrays, IndoQCT), CT Image Quality (MTF, NPS, SNR, CNR, LCD), DICOM Data Pipelines
- **Programming & Machine Learning: :** Python (NumPy, Pandas, SciPy, scikit-learn, PyTorch, Matplotlib, PyRadiomics, SHAP), FastAPI, SQLite, Docker, MATLAB, Embedded C / Arduino, Git & GitHub
- **Quantitative & Signal Methods:** Time-Series & Biosignal Acquisition (EMG), Statistical Hypothesis Testing (Normality checks, Mann-Whitney U with FDR correction, Effect Sizes), Dimensionality Reduction (PCA), Cross-Population Domain Shift Auditing, Explainable AI (SHAP)
- **Tools & Software:** 3D Slicer, Google Workspace, Microsoft Office, Canva, WordPress
- **English Proficiency:** IELTS Academic - Overall Band 7.5 (Listening: 8.5, Reading: 8.0, Speaking: 7.0, Writing: 6.5; Aug 2026)