

Report on Participation and Presentation at QPAIN 2026

This report highlights the successful presentation of the research paper titled “**Fair and Explainable Machine Learning Framework for Heart Disease Prediction**” at the **2026 IEEE 2nd International Conference on Quantum Photonics, Artificial Intelligence, and Networking (QPAIN)**. The conference was held from April 16–18, 2026, in Chittagong, Bangladesh, and was organized by the IEEE Photonics Society Bangladesh Chapter.

Presentation Details:

Presentation Date: April 16, 2026

Time Slot: 8:00 AM – 10:00 AM

Mode of Presentation: Online (via Google Meet)

During the presentation session I presented our proposed machine learning framework for heart disease prediction that emphasizes not only predictive accuracy but also fairness, calibration and explainability. The research evaluated multiple supervised learning models including Logistic Regression, Random Forest, XGBoost, Support Vector Machine and Naïve Bayes using stratified 10-fold cross-validation. Explainable AI techniques such as SHAP and LIME were incorporated to improve transparency and clinical interpretability of the predictions.

The proposed framework achieved outstanding performance where Random Forest and XGBoost demonstrated approximately 99.6% accuracy with near-perfect AUC scores and strong calibration results. In addition, subgroup fairness analysis across sex and age groups was conducted to ensure equitable model performance. The presentation also highlighted how explainable AI methods identified clinically significant features such as chest pain type, ST depression, maximum heart rate, and number of major vessels as key predictors for heart disease detection.

Following the presentation, I actively participated in the Q&A discussion session where I explained the research methodology, preprocessing pipeline, fairness evaluation strategy, and comparative analysis with previous studies. The session received positive feedback from the conference moderators and participants for addressing trustworthy and interpretable AI in healthcare applications. The paper has been accepted for inclusion in the IEEE Xplore Digital Library and indexing by Scopus. This achievement represents an important milestone in our ongoing research activities in the field of machine learning and healthcare analytics at AIUB.

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