An Analytical Model for Real-Time Decision-Making in Time-Sensitive Healthcare IoT Applications Using Explainable AI

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1 Introduction

Artificial Intelligence (EXAI) Development of AI and ML Algorithms in an attempt to explain the working model of such a machine the way a person can interpret the decision. The term "EXAI". Van Saum et al. in 2004 showed a system for interpretation AI behavior in game applications. Because there are various IoT-based sensor devices and complex applications in healthcare AI algorithms such as Convolutional Neural Networks (CNN) or Deep Neural Net (DNN) to perform complex operations on large data sets. predict or diagnose health problems and provide treatment for health problems. Techniques such as Bayesian learning, Saliency maps, and others facilitate transparency in checking decisions about how AI models arrive at conditions and ensure traceability in clinical products. This is useful for deep models (image analysis) for applications such as tumor segmentation. He directs the clinic XAI. Explain the black box model and the decision-making process for testing Making decisions with Machine Learning algorithms medical field.
Some of the more commonly used EXAI terminology is:

- Interpretation: In speech, it refers to the feeling of understanding the artificial function
- Explainability: Explain how different types are selected customers.
- Transparency: Assess the availability of information or models.
- Reliability: This refers to the weight of the facts to reach a certain conclusion.
- Competition: shows how users can challenge the judgment.

The main reason for my research topic is to fill the gap between health care Be patient with the experts and comment on the predicted results so he is concerned about himself in case the patient cannot return for health professionals today.

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2 Literature Review

To fullfill my model requirements i had read the various paper related to the Explainable AI and Healthcare related IoT devices to get the Idea's how the IoT Devices work in healthcare system and also how the ML algorithm automate the IoT devices as well as how can Explainability helps in better understandings.
Here is the summerization of the my works with i had done till now as i read following papers

- "AI 5.0 for Health Explained: Opportunities and Challenges []": Healthcare 5.0 provides real-time patient monitoring, environmental monitoring and health and privacy through assistive technology such as artificial intelligence Artificial intelligence (AI), Internet-of-Things (IoT), supported examples of electronic trocardiogram (ECG) monitoring, protecting privacy; local model using federated learning (FL) and EXAI to test measurements. This is supported by case studies. Research demonstrate the effectiveness of EXAI in healthcare settings that consider real-life models deployment in a variety of clinical applications. They also discuss About the role of Ex AI in real-time decision making in IoT devices.

- "Reliable and resilient IoT-based personal healthcare services [2]: He defines personal healthcare services as a distinct health interaction the patient's condition is based on the characteristics of basic biological processes and related mechanical control systems

- "Real-time IoT-based signal quality-aware ECG telemetry system Health Care Control [1]": Novel Quality Novel An IoT-enabled ECG telemetry system continuously monitors heart health program. The actual evaluation results are more representative of what is offered A quality-aware ECG telemetry system will significantly reduce battery consumption acceptable quality of ECG signals through conduction and put the IoT device into sleep mode for unacceptable ECG signals The test also shows the presence of an ECG signal become worse during more intense physical activity.

2.1 Literature Survey: Summary List

S. No.	Authors and Year	Problem Statement	Material and Method	Results	Limitations
1.	DEEPTI SARASWAT et al, 2022	Explainable AI for Healthcare 5.0: Opportunities and Challenges	Propose Comprehensive,personalized healthcare services by contextualizing Healthcare IoT to Support Clinical per- sonalization ,discuss AI and non-AI based techniques as well as use case example	AI and non-AI approach ,IoT	Lacks evalution of scheme for a particular medical case as well as integration of EXAI.
2.	Najma Taimoor et al, 2021	Reliable and resilient AI and IoT-based personalised healthcare services: A survey.1	Enables researchers to have current knowledge of state-of-art challenges in EXAI and overcome the challenges through a proposed taxonomy using decision fit approach	Functioning Based,Conceptual and Result based approach, Decision Tree fitting	Does not discuss subcategories for feature relevance methods
3.	Udit Satija et al, 2017	Real-Time Signal Quality-Aware ECG Telemetry System for IoT-Based Health Care Monitoring	M.L,IoT,WBAN,BNC.	s the battery power consumption by transmitting the acceptable quality of ECG signals and putting the IoT devices to sleep mode for the unacceptable ECG signals.	NA

Table 1: Summary List