

Decision Support Using an Explainable Artificial Intelligence(XAI)

for Predictive Process in Healthcare Applications

In recent years, artificial intelligence (AI)-driven predictive modeling has revolutionized healthcare by enabling more accurate diagnoses, personalized treatments, and improved patient outcomes. However, the opaque nature of many AI models—often described as “black boxes”—has raised concerns among healthcare professionals and patients about their reliability and interpretability. Explainable Artificial Intelligence (XAI) addresses this challenge by providing transparency into the decision-making processes of AI systems, thereby enhancing trust and enabling clinicians to make well-informed decisions.

This research focuses on developing an XAI-based decision support framework for healthcare applications such as medical imaging, drug discovery and development, and disease prediction and prevention. The framework aims to clarify AI predictions through both information-based and instance-based explanations, supporting healthcare providers in integrating predictive models into their workflows. Moreover, transparency facilitated by XAI is critical for regulatory compliance, as it offers clear audit trails that strengthen accountability in healthcare AI systems.

By fostering collaboration between AI algorithms and healthcare professionals, XAI not only promotes trustworthy AI adoption but also empowers patients to actively participate in their healthcare decisions. Through transparent explanations, patients gain deeper insights into their conditions, enabling informed choices and increased confidence in AI-supported care. Ultimately, this research aims to deliver a comprehensive XAI framework that enhances decision-making capabilities while demystifying complex predictive models, fostering trust, and driving actionable insights in healthcare.