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Biosensors for Real-Time Virus Detection Using IoT and Neural Network Optimization Models

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Abstract:

The emergence of infectious diseases necessitates rapid, reliable, and scalable virus detection methods. This study presents an integrated biosensor system empowered by Internet of Things (IoT) technology and neural network optimization for real-time virus detection. The proposed framework utilizes advanced biosensors capable of detecting viral biomarkers in biological samples, which are then connected to an IoT network for continuous data transmission. Deep neural networks are trained to analyze biosensor output, classify viral presence, and predict infection patterns with high accuracy. Optimization algorithms are applied to enhance detection sensitivity and reduce false positives. This intelligent biosensing platform enables timely health interventions and efficient disease management, particularly in high-risk urban environments and remote healthcare settings. The system demonstrates significant improvements in detection speed, accuracy, and scalability compared to traditional diagnostic methods.

Keywords:

Biosensors, virus detection, IoT, neural networks, real-time monitoring, health optimization.

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