Journal of Computer Science and Information Systems,

ISSN 2535-1451

Biosensors for Virus Detection Using IoT-Based Neural Network and Machine Learning Models

Nader Behdad, Lima Hongou, Sofia Arkhstan

1. Electrical and Computer Engineering, The Polytechnic University of the Philippines, Manila, 1016, Philippines
2. Faculty of Engineering, Computer Technology, UCSI University, Kuala Lumpur 56000, Malaysia
3. Department of Computer System, South Ural State University, 454080 Chelyabinsk, Russia

Abstract:

Rapid and accurate virus detection is critical for effective disease control and public health response. This study explores the integration of biosensors with IoT-based neural network and machine learning models for real-time virus detection and monitoring. Biosensors, embedded within wearable or portable diagnostic devices, continuously capture biological signals such as biomarkers and viral loads. These signals are transmitted via IoT networks to centralized platforms where machine learning and neural network algorithms analyze the data to detect infection patterns, classify viral strains, and predict outbreak risks. The use of models such as Convolutional Neural Networks (CNNs), Support Vector Machines (SVMs), and decision trees enhances diagnostic accuracy, reduces false positives, and supports timely interventions. The proposed intelligent biosensing framework demonstrates significant potential in improving surveillance systems, enabling decentralized healthcare, and supporting global efforts in managing infectious disease threats.

Keywords:

Biosensors, virus detection, IoT, neural networks, machine learning, real-time monitoring.

ISSN 2535-1451

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