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# Face Mask and Social Distancing Detection System

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**Abstract:** *The spread of COVID-19 has been taken on pandemic magnitudes and has already spread over 200 countries in a few months. In this time of emergency of COVID-19, especially when there is still a need to follow the precautions and developed vaccines are not available to all the developing countries in the first phase of vaccine distribution, the virus is spreading rapidly through direct and indirect contacts. The World Health Organization (WHO) provides the standard recommendations on preventing the spread of COVID-19 and the importance of face masks for protection from the virus. The excessive use of manual disinfection systems has also become a source of infection. That is why this research aims to design and develop a low-cost, rapid, scalable, and effective virus spread control and screening system to minimize the chances and risk of spread of COVID-19.We proposed an IoT-based Smart Screening and Disinfection Walk-through Gate (SSDWG) for all public places entrance. The SSDWG is designed to do rapid screening, including temperature measuring using a contact-free sensor and storing the record of the suspected individual for further control and monitoring. Our proposed IoT-based screening system also implemented real-time deep learning models for face mask detection and classification. This module classified individuals who wear the face mask properly, improperly, and without a face mask using VGG-16, MobileNetV2, Inception v3, ResNet-50, and CNN using a transfer learning approach. We achieved the highest accuracy of 99.81mask detection and classification module. We also implemented classification to classify the types of face masks worn by the individuals, either N-95 or surgical masks. We also compared the results of our proposed system with state-of-the-art methods, and we highly suggested that our system could be used to prevent the spread of local transmission.*

**Keywords:** Covid-19, Mask, No Mask, Social Distancing, Machine Learning Algorithm, Neural Network

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