



Indoor Crowd Interaction Surveillance Using Image Processing in Post-COVID-19 Situation

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Abstract

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Human interaction is limited in today's society because of Covid 19 health restrictions, which are in place to prevent the virus from spreading. According to the rules, individuals must be at least one meter apart, and the number of individuals in an indoor environment is limited to a certain number. However, most people do not follow the instructions, putting the disease's spread at risk. The severity is substantially higher if the environment is indoor. If a single infected person is detected in the area, health officials should trace the close contacts of the person. To answer this problem, the research project was conducted by providing a solution for contact trace. The research is conducted by implementing a convolutional neural network to obtain the risk footage from the CCTV footage and determine the health guideline violations. With the violated information digital contact tracing was done through the face search framework.

Keywords: Image Processing, Deep Learning, OpenCV, Neural Network

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Abbreviations

AI	Artificial Intelligence
ANN	Artificial Neural Network
BP	Backpropagation
CCTV	Closed-circuit Television
CNN	Convolutional Neural Network
COTS	Commercial Off-The-Shelf
CPU	Central Processing Unit
CSV	Comma-Separated Values
CUDA	Compute Unified Device Architecture
CV	Computer Vision
DCL	Density-Aware Curriculum Learning
DL	Deep Learning
GPU	Graphics Processing Unit
HOG	Histogram of Oriented Gradients
IoT	Internet of Things
LBP	Local Binary Pattern
LSTM	Long Short-Term Memory
ML	Machine Learning
MOH	Medical Officer of Health
PQ	Product Quantization

PSD	Pixel Shuffler Decoder
RFID	Radio Frequency Identification
RGB	Red Green Blue
RNN	Recurrent Neural Network
ROC	Receiver Operating Characteristic
RPI	Relative Performance Information
ReLU	Rectified Linear Unit
SNR	Signal To Noise Ratio
SVM	Support Vector Machines
WHO	World Health Organization
mAP	Mean Average Precision