Savitribai Phule Pune University

A PRELIMINARY PROJECT REPORT
ON

Contactless System Navigation Using Dynamic Hand Gesture Recognition By 2D Convolutional Neural Networks and Short-Term Sampling

Submitted by

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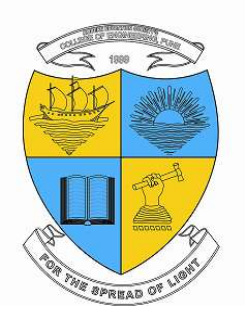

C E R T I F I C A T E

This is to certify that the Project Entitled
DYNAMIC HAND GESTURE RECOGNITION USING 2D CONVOLUTIONAL NEURAL NETWORKS AND SHORT-TERM SAMPLING

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is a bonafide work carried out by Students under the supervision of Prof. Guide Name and it is submitted towards the partial fulfillment of the requirement of Bachelor of Engineering (Computer Engineering).

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ABSTRACT

Hand gestures are a natural way for human-robot interaction. Vision based dynamic hand gesture recognition has become a hot research topic due to its various applications.

This project implements a network for hand gesture recognition. The network integrates various modules together to learn both short-term and long-term features from video inputs. A substantial aim is to minimize intensive computation, since handling the video inputs can be an exhausting and computationally expensive task.

Short-term features are learned by segmenting the video input into a fixed number of frames. Then, a frame is randomly selected and represented both, as an RGB(Red, Green, Blue colour channels) image and an optical flow snapshot. These two, i.e., RGB image and optical flow snapshot, are then fused and fed into a convolutional neural network(CNN) for the purpose of feature extraction.

Long-term features are learned by a similar process. The outputs from all the convolutional neural networks are fed into a long short term memory (LSTM) network, and a hence a final classification result is obtained.

As an application to extend the scope of the project, we intend to use the hand gestures classified to perform basic system control.