**Human Behaviour Recognition Based on Multiscale Convolutional Neural Network**

**Abstract:**

The key problem in human behaviour recognition is how to build a spatiotemporal feature extraction and classification network. Aiming at the problem that the existing channel attention mechanism directly pools the global average information of each channel and ignores its local spatial information, this paper proposes two improved channel attention modules, namely the space-time (ST) interaction module of matrix operation and the depth separable convolution module, combined with the research of human behaviour recognition. Combined with the superior performance of convolutional neural network (CNN) in image and video processing, a multi-scale convolutional neural network method for human behaviour recognition is proposed. Firstly, the behavior video is segmented, and low rank learning is performed on each video segment to extract the corresponding Low rank behavior information, and then these Low rank behavior information are connected on the time axis to obtain the Low rank behavior information of the whole video, so as to effectively capture the behavior information in the video, avoiding tedious extraction steps and various assumptions. The ability of neural network to model human behavior can be transferred and reused in networks with different structures. According to the different characteristics of data features at different network levels, two effective feature difference measurement functions are introduced to reduce the difference between features extracted from different network structures. Experiments on several public datasets show that the proposed method has a good classification effect. The experimental results show that the method has a good accuracy in human behavior recognition. It is proved that the proposed model not only improves the recognition accuracy, but also effectively reduces the computational complexity of output weights and improves the compactness of the model structure.

**Existing System**

However, due to the complexity of human behavior itself, and human behavior is easily disturbed by complex background, occlusion, light and other environmental factors, most of the current feature extraction methods are cumbersome and prone to error transmission, Moreover, it is difficult to effectively model the relatively slow or static behavior. In addition, the convolutional neural network with a single scale can not fully describe the human behavior characteristics from multiple angles, which is not conducive to the final behavior recognition.

**Disadvantages**

1.Less accuracy.

**PROPOSED SYSTEM**

In propose work author applying 3DCNN algorithm for human behaviour prediction as all existing algorithms were directly employing global average information of each channel (taking all channels of images as single data) which ignores spatial and depth information from image features which leads to inaccurate recognition. If model has accurate information or each shape from the image then it can predict accurately. So in propose work author employed two different module such as space-time (ST) interaction moduleof matrix operation and the depth separable convolution module, combined with the research of human behaviour recognition. Combined with the superior performance of convolutional neural network (CNN)in image and video processing, a multi-scale convolutional neural network method for human behaviour recognition is proposed. Combination of spatial and depth separable module is known as Multiscale Convolution Neural Network (MCNN or MDN). Propose model is experimented on UCI HAR dataset which captured human activity using Smart Phone. Propose model giving best accuracy compare to existing CNN2D or LSTM.

In propose algorithm author has reduced training complexity by implementing MCNN model using CNN3D architecture which is lighter in training and can reduce complexity. Propose model MCNN CNN3D required 3300 training parameters and existing CNN2D required 9000 parameters.

We have compared both existing CNN2D and propose MCNN (CNN3D) in terms of training complexity and accuracy and in both model propose work accuracy is high and complexity is less.

**Advantages**

1. High Accuracy

**Extension Concept**

To further enhance accuracy we have combined 3 algorithms together called CNN + GRU + Bidirectional with less number of training parameters which help in further reducing model complexity with 1000 parameters and its accuracy is high compare to propose and existing algorithms. Extension hybrid optimizing training features with 3 different CNN + GRU + Bidirectional which helps in obtaining more optimized features which in turn give better accuracy.

**HARDWARE REQUIREMENTS:**

# Processor - Intel i3(min)

* Speed - 1.1 GHz
* RAM - 4GB(min)
* Hard Disk - 500 GB

**SOFTWARE REQUIREMENTS:**

* Operating System - Windows10(min)
* Programming Language - Python with Jupiter notebook