

# Abstract

Human Action Recognition is very significant in the field of computer vision as it allows the machines (computers) to recognize what humans are doing and can take necessary actions in response. Although Human Action Recognition involves a lot of challenges, it has gained huge importance over the years and these algorithms are already employed in various fields such as Human Computer Interaction, Smart Homes, security, transportation, medication management and education. Because of its positive impact these techniques have been deployed for video processing for human action analysis in many more fields. However, the existing algorithms based on videos needs to improve for it to be employed reliably for applications such as assistive robotics and augmented reality gaming. Here, we are trying to achieve the same for a specific set of actions such as Jog on the spot; Jump forward; Jump high; Jump sideways. This work is focussed on researching various algorithmic approaches with machine learning models to not only recognise these actions but also calculate the results of these actions based on specific criteria. The criteria for Jump High and Jump Forward is the distance jumped; for Jump Sideways and Jog is the number of Jumps or Jogs respectively. This is addressed by two approaches. The first approach focusses on deriving joint based features of the human for each frame in the videos and training classification algorithms on all the frames and calculating the results as per criteria. The second approach focusses on directly running deep convolutional neural networks with and without transfer learning on all frames of the videos and classify them as per their labels and calculate the results based on the criteria. The video dataset used for this experiment is collected as part of a research conducted for studying the learning capabilities of children at different ages. The experimental results shows that the first approach is more accurate, more efficient and less complex.