Investigating The Performance Of Joint-based Human Action Recognition Models in Children

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This project seeks to perform Human Action Recognition on video datasets of children for a given set of actions, namely - Hop Left, Hop Right, Gallop and Skip. The objective is to automatically recognise if a certain defined set of fixed criteria match the actions performed by the children in the videos. For this purpose, individual joint locations were detected and used to create a heuristic based approach to label the videos frame-by-frame. The labelled joint coordinates data was used to train different models to predict the labels of frames as a supervised classification problem; and observe what heuristic performs the best for a particular action by evaluating their performance in terms of frame-by-frame classification accuracy and pre-collected human based analysis of the data. It was observed that the models trained based on this approach perform the best for the Hop Left/Right action, followed by Skip. The project also discusses the challenges of working with raw video data and what approaches can be used to solve some of them - based on existing literature in the area of Human Action Recognition and new approaches to fit the dataset.