Human Action Recognition
A Novel Approach to Count Repetitive Actions

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Gross Motor Action Recognition in children is a nuanced field of research with many complexities. While general human action recognition has been well researched with a plethora of off-the-shelf solutions for pose and activity detection, there has been comparatively much less research aimed towards child action recognition. Such a system aimed towards children has a large number of applications in assessing growth of children. Identifying and measuring such activities can be used as an indicator of gross motor skills development in children. Gross motor skills are closely related to cognitive development and thus such a system can be used to determine the onset of growth issues in children. By detecting and identifying such issues at an early stage, it becomes possible to take corrective actions accordingly. This project aims to create a system to identify and count 4 repetitive actions of squatting, jogging on a spot, walking on a line and running and coming to a stop on an in-house dataset of children. The project proposes a single-frame classification approach for action recognition in children. By breaking down videos into frames and assigning individual labels for each frame specifying an intermediate state for each action, a new and more interpretable approach to action recognition is proposed that does not rely on complex black-box neural networks. The efficiency of the proposed model was evaluated and possible improvements and drawbacks are identified. This dissertation also highlights the key issues that were faced while working with data pertaining to children.