



Human Action Imitation

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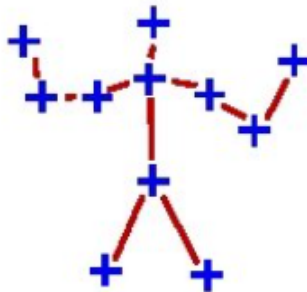
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Human action imitation is a computer vision problem that tries to estimate human body joints location and decide how they are connected to each other. Human action imitation is a way of retrieving videos emerged from Content Based Video Retrieval (CBVR). It is a growing area of research in the field of computer vision nowadays. Human action imitation has gained popularity because of its wide applicability in automatic retrieval of videos of particular action using visual features. The most common stages for action recognition includes: object and human segmentation, feature extraction, activity detection and classification. Human action imitation has a strong theoretical significance and wide application prospect in the field of video surveillance, human-computer interaction, virtual reality, etc.

- Human action imitation plays a significant role in human-to-human interaction and interpersonal relations. Because it provides information about the identity of a person, their personality, and psychological state, it is difficult to extract. The human ability to recognize another person's activities is one of the main subjects of study of the scientific areas of computer vision and machine learning.
- Among various classification techniques two main questions arise: “What action?” (i.e., the recognition problem) and “Where in the video?” (i.e., the localization problem). When attempting to recognize human activities, one must determine the kinetic states of a person, so that the computer can efficiently recognize this activity. Human activities, such as “walking” and “running,” arise very naturally in daily life and are relatively easy to recognize.

Problem Statement

- Human Action Imitation or HAI for short, is the problem of predicting what a person is doing based on a trace of their movement by imitating their actions.



Literature Survey

Year	Name of the Author	Journal	Outcome
2020	D. C. Luvizon, D. Picard and H. Tabia	Multi-Task Deep Learning for Real-Time 3D Human Pose Estimation and Action Recognition	In this work, we presented a new approach for human pose estimation and action recognition using multi-task deep learning. The proposed method for 3D pose provides highly precise estimations with low resolution feature maps and departs from requiring the expensive volumetric heat maps by predicting specialized depth maps per body joints
2018	M. Liu and J. Yuan	Recognizing Human Actions as the Evolution of Pose Estimation Maps	With recent advances of human pose estimation, instead of relying on the inaccurate human poses estimated from videos, we observe that pose estimation maps, the byproduct of pose estimation, preserve richer cues of human body to benefit action recognition.
2018	F. Sajjad, A. F. Ahmed and M. A. Ahmed	A Study on the Learning Based Human Pose Recognition	In learning based human pose recognition. This paper listed the available sensors used for human pose recognition. They described the feature extraction and classification techniques used in literature. They also listed the publicly available datasets that are used in research for human pose recognition.

Literature Survey

2017	V. Belagiannis and A. Zisserman	Recurrent Human Pose Estimation	This paper proposed a ConvNet model for predicting 2D human body poses in an image. The model regresses a heatmap representation for each body keypoint, and is able to learn and represent both the part appearances and the context of the part configuration.
2017	C. J. Dhamsania and T. V. Ratanpara	A survey on Human action recognition from videos	This paper comprehensively discusses the methods and limitations in the field of human action recognition. Trajectory based approach, hierarchical approach, semantic descriptor based approach, spatio-temporal interest point based approaches are used widely for human action recognition. Thus the human action recognition methods conclude that the progress in the field of action recognition is encouraging.

References

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- <https://ieeexplore.ieee.org/document/8701267>
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- <https://arxiv.org/abs/2110.04119>
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Thank You