ABSTRACT

Human fall movements, especially in the elderly, can be fatal and significantly impact quality of life. While fall risk assessment methods exist, many systems still rely on medical history data and cannot provide real-time predictions. This research develops a self-attention-based model called MultilabelAttention to predict human fall movements by utilizing visual data from body keypoint detection. The extracted data is then processed using the sliding window technique to form data sequences. This model employs an attention mechanism to understand the spatial and temporal relationships in fall movements. Experimental results show an accuracy of 61,0% in predicting fall movements, with an MPJPAE of 59,4599 pixel and an MPJVE of 27,116 px/frame. Adjusting the optimizer parameters and weight loss improves accuracy and the model's ability to detect movement patterns more effectively. This model provides significant contributions to the development of human movement prediction technology, particularly for more accurate fall detection.

Keywords: *fall movement prediction, human motion, self-attention, keypoint detection, sliding window*