

Unsupervised graph autoencoder framework for anomaly detection in neurological rehabilitation using markerless motion tracking.

 2026.congresso.sif.it/talk/184

-
-
-

This work introduces a Graph Autoencoder (GAE)-based approach for anomaly detection in neurological rehabilitation, aimed at supporting quantitative assessment of motor function. Human skeletal motion, extracted via markerless tracking, is modeled as a graph to preserve biomechanical relationships between joints. In clinical contexts where labeled pathological data are scarce, a semi-supervised strategy is adopted: the model is trained on normal movement only and detects anomalies through reconstruction error. Graph-based autoencoders are particularly suited to this task, as they capture both spatial structure and temporal evolution of human motion . This enables identification of subtle deviations potentially associated with motor impairments. The proposed methodology offers a non-invasive, scalable, and interpretable tool for continuous patient monitoring, contributing to the integration of artificial intelligence in medical physics and rehabilitation sciences.