CS PhD Seminar Series

Sep 23rd | 14:30-15:00 | Room 214

Closing the Gaps: Three Statistical Approaches to Motion Capture Data Imputation

Motion capture (MoCap) is a powerful tool across biomechanics, animation, and robotics, but missing data due to marker occlusions remains a common challenge. This talk explores three statistical approaches for reconstructing occluded markers: Gaussian Process Regression (GPR), the Synthetic Control Method (SCM), and a Matrix Completion (MC) algorithm. Unlike conventional gap-filling methods, these techniques exploit relationships among multiple body markers rather than relying on a single trajectory. Their performance is evaluated on a dataset of human motion, using a rigorous cross-validation framework and standard error metrics. The comparison highlights not only differences in reconstruction accuracy but also in computational efficiency, offering insights into when each method may be most suitable for MoCap applications.

Speaker: **Gabriele Romano**

Gabriele Romano is a Computer Engineer and first-year PhD student in Computer Science at the University of Genoa. He received his Bachelor's Degree in Industrial and Information Engineering from Politecnico di Milano (2021) and his Master's Degree in Computer Engineering from the University of Genoa (2023). His Master's thesis focused on developing a machine learning approach to identify the perceived origin of movement in Motion Capture data and comparing it with an existing approach based on a cooperative game theory. His current research investigates the automatic analysis of human movement through Motion Capture, with a focus on movement qualities such as impulsiveness, using Machine Learning and statistical techniques.