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Person identification across actions from biological motion.

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A significant amount of past research has studied person identification from point light displays of walking humans, investigating parameters such as viewing angle and the differential contributions of structural and kinematic information. However, little is known about the ability of human observers to generalize identity across different activities. In this study we use a same/different paradigm to compare observers' ability to identify point light displays within and across activities. We drew from a database of 100 motion-captured humans, each of which encompassed both walking and running activities. Subjects were shown successive paired stimuli and had to indicate whether the stimuli represented the same or different person. In either case, the two displays were at slightly different viewpoints. Two independent factors were examined: stimulus pairing (walker/walker, runner/runner, walker/runner) and information content (structural only, kinematic only, full information). For all information contents for stimulus pairing of matching activities (walker/walker, runner/runner) subjects performed significantly better than chance ($t(5)=2.71$, p0.05). The main effect of Pairing was significant ($F(2, 30)=35.7$, p[[lt]]0.001), with the walker/runner pairing being the most difficult. Information was not a significant factor. However, there was a significant interaction between Pairing and Information ($F(4, 30)=4.03$, p[[lt]]0.01) that manifested in performance on the runner/runner task in particular being better for full information than for structural or kinematic only. Results are discussed in light of a principal components-based linear model that estimates a runner time series from a given walker time series by equating principal component coordinates.