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Study on Heterogeneous Roles in Coordinated Behavior of a Triad Using Force-based Models

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Abstract

Humans interact based on others' roles to achieve a group goal. A previous study indicated that the adjusting role is related to high task performance in the coordinated behavior of a triad. The action may handle others' or its misses resiliently and maintain an overall balance; however, the previous results alone can not explain the adjustment process in the crucial role. This study formulated the three heterogeneous roles in the coordinated drawing task using equations of motion, where a triad operate reels to change thread tensions and move a pen connected to the three threads to draw an equilateral triangle. The simulation results showed that, for drawing at least three sides, the adjusting role may use the degree of pen deviation on each side that is influenced by other operators to change the tension. Our findings contribute to understanding of complex and dynamically planned coordination through supplementing the experimental results.