Defense Announcement

Metrics on crowd control with overhead video and vocal commands

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This paper presents an agent-tracking framework for semistructured, crowded video. This framework is used to investigate how large numbers of people respond to vocal commands with local feedback and an overhead camera video. We analyze a video showing an overhead view of more than 200 people, each holding an umbrella equipped with red, blue, and green LED lights. The crowd's motion under the vocal command formed a variety of patterns. We use K-means clustering to seperate umbrella from each other. Kalman filtering is used to estimate how each umbrella moves and track their motion path. In particular, we present results on: (1) Automatic segmentation and clsaaification of each umbrella. (2) Analysis of response time to a vocal command. (3) Measuring the accuracy of movement. (4) Calculating the learning rate of human swarm. (5) Documenting the position memory.

Keywords - K-means clustering, vision tracking, crowd control