SAMBA: steadied choreographies

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Given the start positions of a group of dancers, a choreographer specifies their end positions and says: "Run!" Each dancer has the choice of his/her motion. These choices influence the perceived beauty (or grace) of the overall choreography. We report experiments with an automatic approach, SAMBA, that computes a pleasing choreography. Rossignac and Vinacua focused on affine motions, which, in the plane, correspond to choreographies for three independent dancers. They proposed the inverse of the Average Relative Acceleration (ARA) as a measure of grace and their Steady Affine Morph (SAM) as the most graceful interpolating motion. Here, we extend their approach to larger groups. We start with a discretized (uniformly time-sampled) choreography, where each dancer moves with constant speed. Each SAMBA iteration steadies the choreography by tweaking the positions of dancers at all intermediate frames towards corresponding predicted positions. The prediction for the position of a dancer at a given frame is computed by using a novel combination of a distance weighted, least-squares registration between a previous and a subsequent frame and of a modified SAM interpolation. SAMBA is fully automatic, converges in a fraction of a second, and produces pleasing and interesting motions.

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