

A New ICF-based Ball Tracking System with Multi-Exposure Cameras for Virtual Sports

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Abstract—This paper proposes a new ball tracking system for virtual sports. In the proposed system, multi-exposure cameras are used to capture high-speed motion images of ball. Then, a new iterative circle-fitting algorithm based on the circular Hough transform, the OFF-cell filter, and the Hausdorff distance is adopted to track balls with unknown patterns from images. The effectiveness of the proposed ball tracking system is verified through experiments using real balls with various patterns. The usefulness of the proposed system is demonstrated by applying to a virtual sports platform in practice.

Keyword—Ball tracking, virtual sports, iterative circle fitting, circular Hough transform, OFF-cell filter, Hausdorff distance



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