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Comparing Fiducial Marker Systems Occlusion Resilience through a Robot Eye

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Abstract

© 2017 IEEE. A fiducial marker is a system of unique planar markers, that are placed in an environment and should be automatically detected with a camera through marker-specific detection procedures. Their application varies greatly, while the most popular are industrial systems, augmented reality, and robot navigation. All these applications imply that a marker system must be robust to such factors as view angles, types of occlusions, distance and light condition variations etc. Our paper compares existing ARTag, AprilTag, and CALTag systems utilizing a high fidelity camera, which is a main vision sensor of a full-size Russian humanoid robot AR-601M. Our experimental comparison verified the three marker systems reliability and detection rate in occlusions of various types and intensities and a preferable for AR-601M robot applications marker system was selected.

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Keywords

AprilTag, AR-601M, ARTag, CALTag, experimental comparison, fiducial marker, occlusion

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