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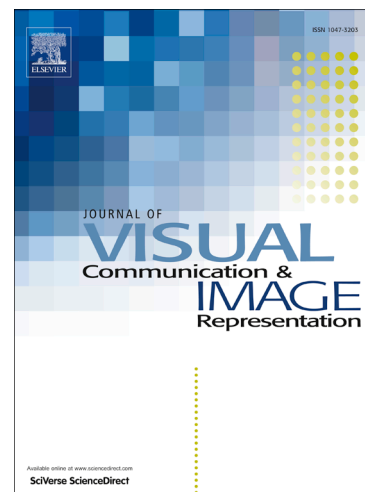
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Wide-angle and long-range real time pose estimation: a comparison between monocular and stereo vision systems

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Abstract

In this work, a comparison of the performances of a stereo and a monocular vision system for the 3D pose estimation of a planar target in very challenging conditions is presented. In particular, the systems have been designed to detect in real time a target moving with a maximum speed of 1 m/s, in a range of distances from 0.5 to 4 m from the cameras, with an accuracy of less than 1 cm (referred to the estimation of the real world coordinates) and with a field of view of 80 degrees. A theoretical evaluation and experimental results to assess the performance of the proposed systems are presented. Our analysis demonstrates the good accuracy in terms of target position estimation of the presented approaches not only for close range applications, but also for mid-to-long range ones.

Keywords: Vision systems; visual tracking; target detection; monocular vision system; stereo vision systems; pose estimation.

1. Introduction

Due to the more and more efficient algorithms and to the rapid progress of hardware processing capability, real time computer vision systems are becoming

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