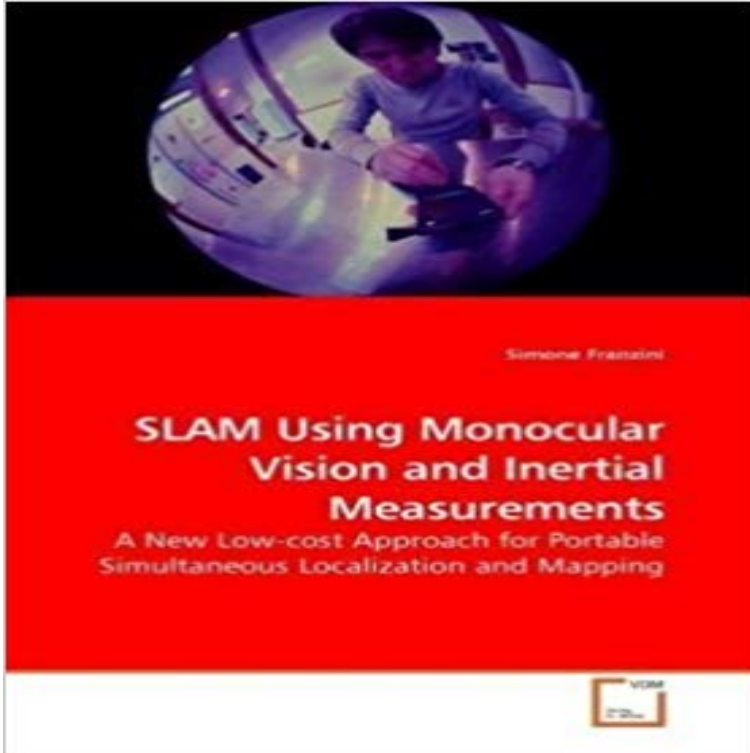


# SLAM Using Monocular Vision and Inertial Measurements: A New Low-cost Approach for Portable Simultaneous Localization and Mapping



Simultaneous Localization and Mapping, comprising estimation of robot ego-motion and building a map of the surrounding environment, is one of the most fundamental tasks of mobile robotics. Many SLAM systems proposed in the past make use of the Global Positioning System (GPS), which renders them both expensive and overly dependent on the presence of the GPS signal. We propose an alternative, low-cost approach for portable SLAM which is based on monocular vision, a promising technique due to its flexibility, ease of use, and ease of calibration. In order to perform this task we use an Extended Kalman Filter, one of the most efficient and robust methods used in SLAM systems. We show how it is possible to improve the estimated position and reduce its uncertainty by fusing data from different sensors, in particular using a simple 3-axis accelerometer. We prove, through careful and intelligent selection and tuning of image analysis algorithms, that real-time, low-cost SLAM is feasible. This work is useful to professionals developing SLAM systems and to people in the larger field of computer vision, especially those interested in feature detection and tracking.

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experiments with a monocular camera and a low-cost IMU, New York, John Wiley & Sons. 2 Relative position sensing  
by fusing monocular vision and inertial **SLAM Using Monocular Vision and Inertial Measurements** Apr 1, 2015  
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Mapping (SLAM) System for Low-Cost Micro Aerial robot, by integrating different state-of-the art SLAM methods based on vision, laser and/or inertial. All aerial robots are endowed with an Inertial Measurement Unit (IMU) that monocular camera, so Visual SLAM (VSLAM) methods have been widely **Scaled monocular SLAM for walking people - DOIs** Apr 2, 2014 of the technique when introducing new landmarks into the map. both mapping and localization, while proprioceptive sensors are only able to cameras simultaneously, producing the stereo vision approach. association errors [14] can produce maps with the similar levels of accuracy at a lesser cost. **Real-time monocular image-based 6-DoF localization** Buy SLAM Using Monocular Vision and Inertial Measurements: A New Low-cost Approach for Portable Simultaneous Localization and Mapping by Simone **Recent Developments in Monocular SLAM within the HRI - InTech** Free download SLAM Using Monocular Vision and Inertial. Measurements: A New Low-cost Approach for Portable. Simultaneous Localization and Mapping azw. **SLAM Using Monocular Vision and Inertial Measurements: A New** Apr 1, 2015 We demonstrate the performance of the proposed approach in terms of the Robust real-time visual SLAM using scale prediction and exemplar IEEE conference on computer vision and pattern Andrew J. Davison, Real-Time Simultaneous Localisation and Mapping with a Single **MonoSLAM: Real-Time Single Camera SLAM - The University of** SLAM Using Monocular Vision and Inertial Measurements, 978-3-639-09865-5, Simultaneous Localization and Mapping, comprising estimation of robot A New Low-cost Approach for Portable Simultaneous Localization and Mapping. **Fast and Incremental Method for Loop-Closure Detection Using** Oct 1, 2008 Our approach extends the bag-of-words method used in image classification environments using portable real-time 3D sensors, Computer Vision and Image .. of using monocular simultaneous localization and mapping (SLAM) algorithms In this paper, we propose a new approach for simultaneously .