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Tesis: **"REAL TIME EMBEDDED RGB-D SLAM USING CNNS FOR DEPTH ESTIMATION AND FEATURE EXTRACTION"**

Resumen:

A robust and efficient Simultaneous Localization and Mapping (SLAM) system is essential for intelligent mobile robots to work in unknown environments. For visual SLAM algorithms, though the theoretical framework has been well established for most aspects, feature extraction and association is still empirically designed in most cases, and can be vulnerable in complex environments. Also, most of the most robust SLAM algorithms rely on special devices like a stereo camera or depth sensors, which can be expensive and give more complexity to the system, that is why monocular depth estimation is an essential task in the computer vision community. While tremendous successful methods have obtained excellent results, most of them are computationally expensive and not applicable for real-time on-device inference. This work shows that feature extraction and depth estimation using a monocular camera with deep convolutional neural networks (CNNs) can be incorporated into a modern SLAM framework. The proposed SLAM system utilizes two CNNs, one to detect keypoints in each image frame, and to give not only keypoint descriptors, but also a global descriptor of the whole image and the second one to make depth estimations from a single image frame, all using only a monocular camera.