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A Computer Vision System that Ensure the Autonomous Navigation of Blind People

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In this paper we introduce a real-time obstacle amework designed to alert the visually impaired f their presence and to assist humans to navigate loor and outdoor environments, by handling a levice. Static and dynamic objects are detected points selected based on an image grid and the multiscale Lucas-Kanade algorithm. Next, we bject classification methodology. We incorporate ram of Oriented Gradients) descriptor into the of Visual Words) retrieval framework and how this combination may be used for obstacle in video streams. The experimental results various challenging scenes demonstrate that our ffective in image sequence with important camera cluding noise and low resolution data and achieves , while being computational efficient.

– object classification, Histogram of Oriented G) and Bag of Visual Words (BoVW).

I. INTRODUCTION

ally impaired/blind person context, the white nts the most evolved tool used for obstacle

II. RELATED WORK

Nowadays, most of the commercial software providing mobility assistance are based on Globa System (GPS). However, these solutions are reliable due to the low accuracy, signal loss and to work in indoor environments [4]. Moreov cannot determine the type of obstacle (e.g. a car even a static obstacle) in the near surrounding of

Computer vision approaches referred as ET Travel Aids) constitute a promising alternative above problems. In the technical literature ther methods introduce in order to help the loca navigation of visually impaired/blind people.

One of the first papers was presented by Wal that proposed a fusion of sensor modalities (*e.g.* pedometer, 3-axis gyroscope and 2D laser sca indoor localization. By means of visual SLAM [6], [7] it is possible to build an incremental environment, providing simultaneously temporal spatial orientation of the user. In [8] a stereo vis introduce that estimates a 3D map of vicinity degree of freedom egomotion algorithm. The re