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ırable Navigation System for the Blind Pe in Dynamic Environments

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This paper presents a novel wearable navigation e blind and visually impaired in unknown dynamic s. Usually, feature-based visual navigation and 3D n works very well for static environments. In this amic environment is considered, where a moving wed by a moving monocular camera with inertial ovel method based on feature points from a video proposed to not only estimate the camera motion the 3D motion of the moving object so as to infer tween the camera and the moving object. Firstly, quence is segmented into static and dynamic areas try constraints: AGOF-aided homography recovery d epipolar geometry constraint, which is the first tion of this paper. Then the motion area related ing object can be considered as if a static object by a "virtual camera", while the extracted features tic background are used for estimating the motion camera", compared with the "virtual camera". The ntribution is to solve the problem of scale ambiguity r camera tracking. The scale is firstly adjusted to ing a closed form solution with 1-point algorithm timated in metric unit with the help of inertial s. After obtaining the motions for the real and ra, the third key contribution is that the 3D moving on can be derived from these two motions, because amera's motion is actually the combined motion real camera and the moving object. As a result, can avoid collision with moving objects. Finally, we the robustness and effectiveness of our proposed a series of experimental results.

***ns*—Blind navigation, dynamic scenes, 3D recon-le ambiguity, structure from motion.**

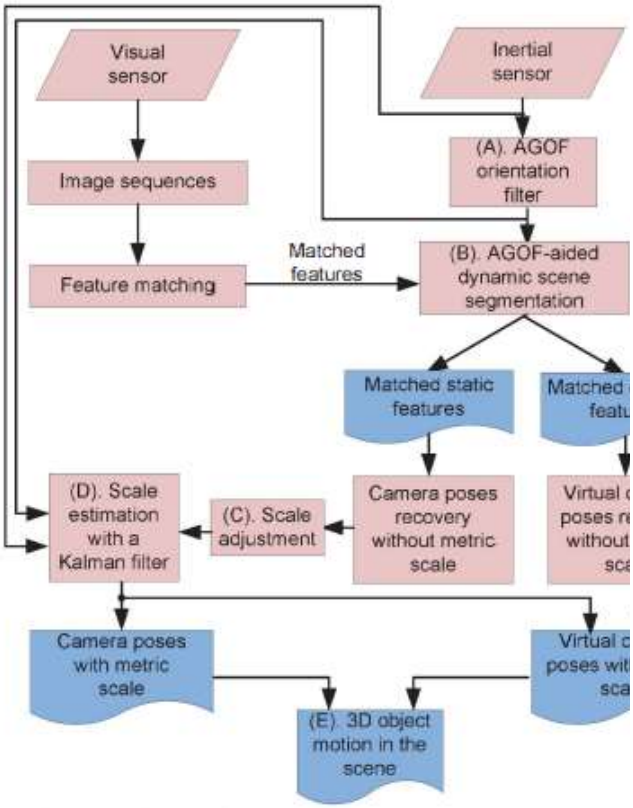

Fig. 1. The flowchart of the proposed method.

recognition, or camera ego-motion, the common are based on the principle of triangulation. Ho commonly assumed that the 3D scene is static, triangulation can only be enabled in the situation 3D object in at least two views. If the scene is dyn moving objects appear, the rules of triangulation a not satisfied, unless some constraints are further [8]. Another problem is about the depth estimation