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SURVEY ARTICLE

Fast Road Tracking for Unmanned Ground Vehicles

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Abstract—The paper presents a method for vision based road direction detection for Unmanned Ground Vehicles (UGVs). The method relies on finding the optimal local orientation of the image followed by line detection and a soft voting scheme to determine the vanishing point. The proposed method reduces the computational complexity by using less number of Gabor filters and eliminating the sky pixels for detecting the optimal local orientation of the terrain structure, yet achieving comparable results to existing methods. The main relevance of this method is that it can identify the dominant vanishing points in bifurcating roads and also it overcomes the noisy output due to camera vibrations and poor illumination conditions. The method can be used in developing autonomous navigation system (ANS) in either structured urban environments or unstructured off-road conditions.

Keywords—Sky Line; Gabor Filter; Local Dominant Orientation; Vanishing point; Soft Voting.

Full Text: <http://www.ijcsmc.com/docs/papers/ICMIC13/ICMIC13S16.pdf>