An Efficient and Reliable Coarse-to-fine Approach for Asphalt Pavement Crack Detection

This research paper presented an exceptionally effective pavement crack detection system which is efficient and reliable. There are four prominent features, such as a new explanation of the cracks focused on the pixels with identical grey-level. The adaptive threshold approach for image segmentation considers the geographic variation, atmospheric conditions, geometric characteristics of cracks, a new concept termed Region of Belief (ROB), and crack detection, which begins with a ROB seed, a novel region growing algorithms proposed. For image segmentation, an enhanced adaptive thresholding algorithm is presented. In order to promote identification, a new design Region of Belief (ROB) has been implemented. A novel region growing algorithm was suggested for the identification of defects.

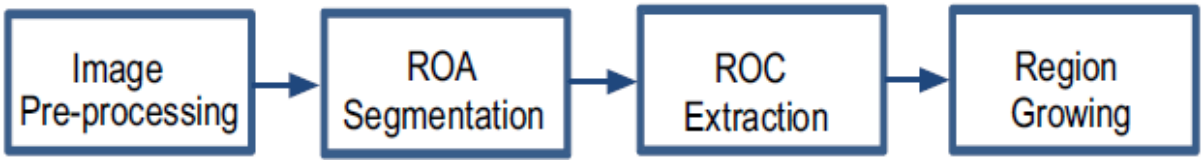

Figure 1. The overall pavement crack detection system

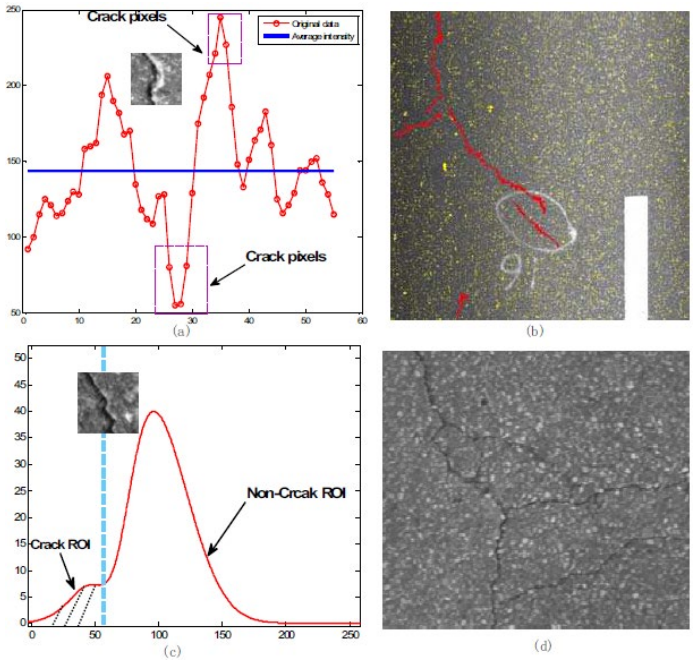

Figure 2. Crack features

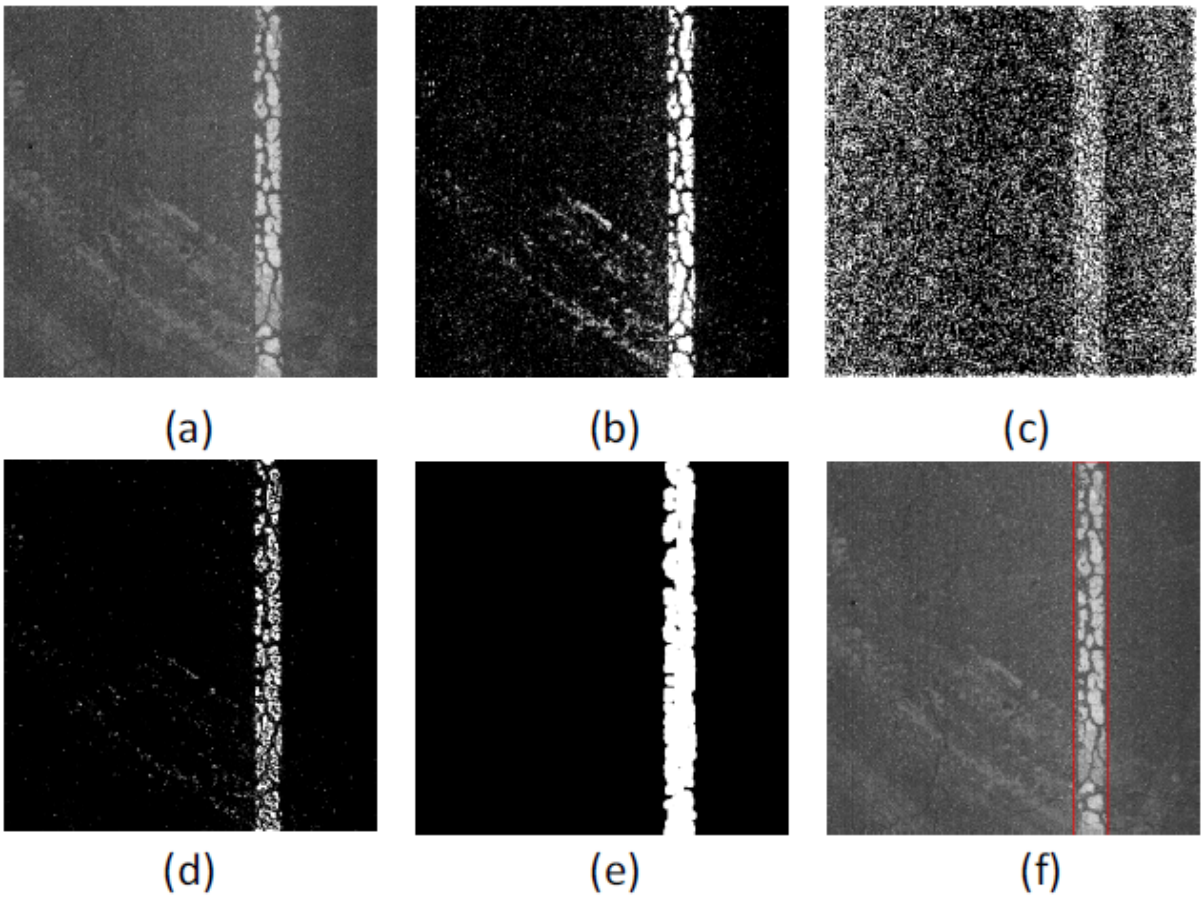

Figure 3. Illustration of process of lane and sign markings removal. (a) the original pavement image, (b) bin map, (c) variance map, (d)fused binary image, (e) further result from morphological processing, (f) final result

The CrackTree and VCrack algorithm were used in this paper. These algorithms detect cracks on the path. However, in the aimed project, it is needed to segment all damages of roads. After analysis, many improvements were needed for the real goal.

References:

[1] D. Zhang, Q. Li, Y. Chen, M. Cao, L. He, and B. Zhang, "An efficient and reliable coarse-to-fine approach for asphalt pavement crack detection," Image and Vision Computing, vol. 57, pp. 130–146, Jan. 2017, doi: 10.1016/j.imavis.2016.11.018.