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Author: Dr. Saili Tang

China Academy of Launch Vehicle Technology (CALT), China, tangsaili@126.com

Mr. Kunyao Xu

China, xukunyue620@163.com

Mr. Jingnan Zhang

China Academy of Launch Vehicle Technology (CALT), China, zjn19820121@126.com

Dr. Wenyi CAI

China Academy of Launch Vehicle Technology(CALT), China, caiwenyi0803@hotmail.com

Mr. Meng Liu

China, mengli2005@163.com

SPACE OBJECT RECOGNITION BASED ON CONTOUR CONSTRAINT AND TEXTURE FEATURE

Abstract

As core functions of space surveillance system, accurate classification and recognition of space objects are more and more urgently needed in the fields of spatial military and surveillance, especially the number of space objects has been increasing rapidly in recent years. Space object classification is a fundamental problem in pattern recognition and computer vision. As one of bottleneck problems of this thesis, efficient feature extraction is very important to improve the recognition result. In this paper, a novel texture feature extraction and object classification method using contour constraint is proposed. Firstly, based on the finer object region, spatial detail information (SDI) can be obtained by Retinex thesis. The SDI could improve the robustness of texture feature and reduce the impact of interference information such as noise. Then, a local binary pattern based on SDI (LSDIBP) is presented to reflect the characteristics of space object texture information. Finally, in order to obtain robust classifier, multiple kernel learning based on support vector machine (MKL-SVM) is used to fusion features and accomplish the classification. Experimental results indicate that the proposed approach is more appropriate for space object recognition than others texture based method. Encouraging recognition rate could be obtained based on space object image database, and the highest recognition result could achieve 97