An Efficient Algorithm for Raster-to-Vector Data Conversion

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Abstract

Data conversion from raster to vector (R2V) is a key function in Geographic Information Systems (GIS) and remote sensing (RS) image processing for integrating GIS and RS data. The R2V module is available in commercial RS software packages, but there is still room to improve the computation efficiency. This paper presents an efficient R2V algorithm that processes large images and automatically builds GIS topology while scanning image lines one by one. The new algorithm, termed Two-Arm Chains Edge Tracing (TACET), has several significant advantages. First, it converts all types of area objects of RS classification in only one processing cycle. Secondly, it constructs complete area topological relationship by recording the shared edge between two polygons only once. Finally, it is scalable when processing large images. The program based on the algorithm is faster in processing large RS images with comparison to commercial software such as ENVI.