Vectorization of Engineering Drawing Images

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ABSTRACT

There are a lot of engineering drawing images still stored as paper. It's not only a waste of space, but also hard to get the needed file. Recently, within the development of computer and optical device, we can now scan those papers and save them in the computer easily; besides, if we want to develop further in these images, the most effi-cient way is to vectorize them. In last decades, vectorization has been developed in engineer, information, and measurement. Many researches have been published; furthermore, there are some raster-to-vector applications being used now. However, different kinds of images, such as constructional、cadastral 、pipeline、topographic、hand drawing、aerial、printed document, when being vectorized, they have to be dealt with by different ways. This thesis focus on engineering drawing images composed primarily by line, and researches the most important procedures when being vectorized: binarization and thinning and line extraction. In binarization, we focus on the property of engineering drawing images, and propose Adaptive Local Threshold Scheme to convert gray-level to bi-level. The results show that the proposed scheme filters off noise and texture ef-fectively and remains the continuity of the line and intersection at the same time. In thinning and line extraction, we first use the binarized engineering drawing images, then thin and line-extract them. It can decrease images ' size when being saved in the computer, and set up points and line's connectivity and relation automatically. This thesis presents a new binarization and thinning and line extraction operation technic, which are more reliable and have better quality than before. In addition, the software based on this purpose, can be applied by automatic inspection systems、pattern recognition systems、spatial information management.

Keywords : Adaptive local thresholding ; Binary image ; Image segmentation ; Thinning ; Chain code ; Vectorization ; Arc-node Data Model ; Line extraction

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