

Particle Filter based road detection in SAR images

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Automatic or semi-automatic extraction of linear features including roads, rivers and railroads has become a more and more important research area in recent years. Linear feature extraction from synthetic aperture radar (SAR) images can be used in many applications, such as multi-sensor image registration, cartographic applications, and geomorphologic studies. A novel method using Particle Filter is proposed for detection of roads in Synthetic Aperture Radar (SAR) images. The multi-segmented poly-line model is first proposed to give a more accurate description of road curve. The road detection problem in SAR images can be adopted into a Bayesian tracking framework. The Particle Filter is employed for the tracking implementation, where local linear feature and global contextual knowledge are incorporated together into the filtering procedure. The effectiveness of the proposed method is demonstrated by the experimental detection results of a single road as well as road networks.



(a) The original SAR image



(b) The detected road

Figure 1. The result of road detection using particle filter