Abstract

Due to rapid urban development, the Geographic Information System (GIS) database needs to be updated with timely and accurate road network information. This paper presents an approach to design a module for image pre-treatment of roads (or roads seeds) and help to decide the most suitable emergency transportation route in disastrous area. Also, in such situation, the quality of the image may degrade during capture or transmission as the entire process becomes prone to noise and instability. Therefore for any kind of information processing or decision making image pre-treatment is a significant part. This paper presents a Multistage Hybrid Median filtering (MHMF) technique to significantly improve noise reduction performance of satellite/aerial road images while preserving the integrity of edge and detail information. Further, the images are divided into subparts and they are processed using the proposed MHMF. Then the two filtered sub-images are combined and we can improve overall performance even further. To support the above claim, a case study has been carried out on two recent natural disasters happened in India along with other benchmark problems and the studies show the effectiveness of the proposed system in real environment.

References
Multistage Sub-Image Filtering Technique with Improved De-noising Feature for Road Detection in Disaster Management


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Index Terms

Computer Science
Image Processing

Keywords

Image Preprocessing    Sub-image    Median Filter    Road Detection    GIS    Objective
Image Quality Metrics

Signal to Noise Ratio

Image Quality Index.