INCIDENT AND TRAFFIC-BOTTLENECK DETECTION ALGORITHM IN HIGH-RESOLUTION REMOTE SENSING IMAGERY

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ABSTRACT: One of the most important methods to solve traffic congestion is to detect the incident state of a roadway. This paper describes the development of a method for road traffic monitoring aimed at the acquisition and analysis of remote sensing imagery. We propose a strategy for road extraction, vehicle detection and incident detection from remote sensing imagery using techniques based on neural networks, Radon transform for angle detection and traffic-flow measurements. Traffic-bottleneck detection is another method that is proposed for recognizing incidents in both offline and real-time mode. Traffic flows and incidents are extracted from aerial images of bottleneck zones. The results show that the proposed approach has a reasonable detection performance compared to other methods. The best performance of the learning system was a detection rate of 87% and a false alarm rate of less than 18% on 45 aerial images of roadways. The performance of the traffic-bottleneck detection method had a detection rate of 87.5%.

Key words: aerial image analysis; incident detection; Radon transform; traffic bottleneck detection; traffic controlling; vehicle detection.

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