

A Reinforcement Learning Approach for Evaluation of Real-Time Disaster Relief Demand and Network Condition

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Abstract : Relief demand and transportation links availability is the essential information that is needed for every natural disaster operation. This information is not in hand once a disaster strikes. Relief demand and network condition has been evaluated based on prediction method in related works. Nevertheless, prediction seems to be over or under estimated due to uncertainties and may lead to a failure operation. Therefore, in this paper a stochastic programming model is proposed to evaluate real-time relief demand and network condition at the onset of a natural disaster. To address the time sensitivity of the emergency response, the proposed model uses reinforcement learning for optimization of the total relief assessment time. The proposed model is tested on a real size network problem. The simulation results indicate that the proposed model performs well in the case of collecting real-time information.

Keywords : disaster management, real-time demand, reinforcement learning, relief demand

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