Applying Spatial-temporal Population Distribution to Disaster Reduction in Urban Area

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Abstract

After natural disasters, such as earthquakes, happen, the first priority is to save lives. At that moment, the level of impact for people affected by disasters depends on time and location. Specifically, it is obvious that disasters have strong effects on people living in urban areas with high population density since disasters could lead to serious building damage. Therefore, it is very important to provide detailed information including population and distribution to develop a disaster prevention plan which considers factors such as time, location, and environment. This study developed the method to estimate the dynamic population in Taiwanese urban populations in different times and locations. Furthermore, this method with a geographic information system (GIS) could show the spatial population distribution on a meshed GIS map. In terms of disaster reduction, this study demonstrated the evaluation of casualties after earthquake disasters by using this method. Based on the information of dynamic populations inside buildings, the assessment of building damage, and information from the Taiwan earthquake loss estimation system, this method could rapidly show the temporal distribution of casualties after earthquake disasters. With this method, the efficiency of disaster reduction could also be increased by applying spatial-temporal population information to a disaster prevention plan, or to resource allocation during disaster response.

Keywords: population distribution, mesh analysis, disaster reduction

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