

DEVELOPMENT OF WEB-GIS APPLICATION FOR EMERGENCY ROUTE DECISION AND PLANNING USING AHP ANALYSIS AND PGROUTING ALGORITHM

Sittichai Choosumrong¹, Venkatesh Raghavan, Nicolas Bozon

¹Osaka City University

ABSTRACT

Routing calculation has an important role to play in emergency responses and decisions. For example, it can help ambulances to take one patient to the hospital as fast as possible. This paper presents the implementation of an alternative method to calculate the travel-time of the route, according to the location of an accident and the situation at the destination point. The minimum travel-time from the accident point to the nearest hospital is calculated and some others parameters are taken into account such as the availability of beds in the targeted hospital and the patient's state. The method is based on an adaptation of the pgRouting algorithm with an analytical hierarchy process (AHP) for the Emergency Route Decision and Planning (ERDP).

Moreover, as mobile phones are widely used nowadays, the need for mobile web applications rises. Thus, it should be useful for a driver if they could update the real road condition via android to give the current road condition and also the client GIS can update anytime and anywhere they goes such as a taxi driver everyday they are going to works and sometime if they met some accident or some problem they can update real time traffic road condition via android devices.

The main objective of this work is to implement ERDP system using pgRouting algorithm and AHP analysis, in order to calculate weights of the impedance elements. The routing algorithm is based on the assumption that the patient's condition and the number of available bed in each hospital are known, and that the real road network conditions are available. Using pgRouting algorithms and AHP, the difference ERDP allows us to compute scenarios and to determine the best suitable routes.