

Development of Pedestrian Navigation System Using Short-Term Rainfall Prediction on Smartphone

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Nowcasting is good for short-term weather prediction because its description of the current state of the atmosphere and the prediction of how the atmosphere will evolve during the next several hour (Clifford Mass, 2012).

With advanced features such as high-speed Internet connection device, Global Positioning System (GPS), high-resolution screen, and good computational capabilities, nowadays smartphone can be one of solution for distributing real-time weather information in almost any location. This system is expected able to help students planning their trip from campus to train station by providing specific rainfall prediction, in order to avoid getting rain in the middle of their trip, and can take part in disseminating weather information.

In this study, we would like to combine short-term rainfall prediction from Furuno X-Band Doppler Radar that located at Kobe University and smartphone's advanced features, together with apple's API services to produce a specific rainfall prediction. This system will check rainfall prediction for the next 30 minutes, turn-by-turn based on walking route from departure place to user-selected train station. Final output of this system is giving user advice whether start the trip now or wait for certain minus to avoid rainfall.

Currently, this system is developed using XCode Swift Framework and running only on Apple devices. At the beginning system will identify user's location/departure location by utilizing GPS features on smartphone, then using apple's API system smartphone gets full address of departure location through reverse geo-location method. Process continued by requesting nearby station from departure location, user select one of station as their destination location. Using departure and destination data, system generates walking route and combine route information with short-term rainfall prediction data to check minute-by-minute rainfall along user's walking route.

Current result is that system able to combine two kind of information: user location, map, route direction with rainfall prediction data and giving advise to user best time to start their trip. The next development plan is allowing user to stop in the middle of their trip for example convenience store or bus stop.

Keywords: navigation system, short-term prediction, smartphone