

Fusing Real-Time Geo-Information for a Raster-based Least Cost Navigation in an SDI

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We present an SDI-based navigation approach that fuses real-time information from remote sensors and smartphone measurements for navigating through dense human crowds. Optical images acquired and transmitted by a real-time airborne camera system are used to calculate an estimation of a crowd density map. In addition, the movement speed of the visitors are gathered via a smartphone app and are directly transferred to a geo-database on a webserver. Here, the punctual speed information is converted into rasterised density information to enhance the density estimation derived from the aerial images with newer information. The combined density information is afterwards used for a least-cost navigation performed with GRASS GIS. We utilize the native GRASS GIS support of the pyWPS to integrate our navigation approach in an SDI. Two possible scenarios are presented, namely i) an emergency application and ii) a basic navigation application. A prototypic implementation of the complete system is conducted as proof of concept and allows for presenting preliminary navigation results.