

RoughMaps

A Generic Platform to support Symbolic Map Use in Indoor Environments

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ABSTRACT

An important criterion for many mobile applications today is the ability to support personalised and context-aware information delivery. User positioning and the use of maps are essential for this purpose. The RoughMaps platform has been designed to accommodate the use of symbolic maps, which are often not-to-scale, non-linear, highly abstract in nature, and which often contain only the most salient and most relevant features of a map based on the immediate needs of a given user.

This paper describes the design, implementation, and validation of a platform for managing contextually relevant symbolic maps for indoor positioning. The RoughMaps platform allows untrained users to upload and administer symbolic building maps and related map meta-data for the purpose of indoor positioning. An associated API allows mobile application developers to retrieve map data for client-side use in their personalised and context-aware mobile applications.

In addition to introducing the RoughMaps platform, this work summarises our evaluation of the platform by way of a cognitive walkthrough of the interfaces used to upload maps and meta-data to the server, and by way of a simple client-side smartphone application that integrates dead-reckoning and QR positioning techniques to validate the platform's API for accessing and retrieving symbolic map data.

Results from the cognitive walkthroughs show that the platform can be successfully used to enter details about buildings, symbolic indoor maps, and positioning locations, but that it is important for the interfaces to guide and inform novice users in this process. The walkthrough also shows that the client application can be successfully used to navigate the environment, which validates the platform's API.

This is to our knowledge one of the first platforms that focuses on both the use of symbolic maps and the reuse of existing infrastructure for the purpose of supporting indoor positioning on mobile devices.

KEYWORDS: Indoor positioning, symbolic maps, client-side personalization.