Indoor Signposting and Wayfinding through an Adaptation of the Dutch cyclist Junction Network System

P5 Reflection

Antigoni Makri
Student Number: 4257847
Master: Geomatics for the Built Environment
E-mail: A.Makri@student.tudelft.nl

A new indoor wayfinding assistance system is proposed in this thesis. The starting point for the development of such a system was the observation of the deficiencies of the current indoor wayfinding systems. An already existing outdoor system, for which the main principle is that assistance is provided to the users where they actually need to choose the direction of moving, was used as a model for building an integrated system. The concept of landmark was incorporated in the new system by selecting a physical object to provide guidance after considering the visual, structural and semantic attributes that make an indoor object salient. The system's performance was tested carrying out site observations. The results reveal the potential of the system to act as a solution for the indoor wayfinding problem.

An important contribution of the proposed system in the scientific field is the proposal of the conceptual model for the automatic determination of the decision points, i.e. the functionally relevant points along a route where people are presented with a navigational choice, in indoor environments. The findings of literature indicated that there is no established framework for determining these points despite their significance in indoor navigation task. In this model a geometric space subdivision was performed for the determination of the decision points while also the semantics of the indoor space were taken into account. Therefore, it can be stated that this research encompasses concepts that can be successfully integrated in existing systems or autonomously be applied in new environments.

The topic of the research is in line with the Geomatics programme as it is concerned with spatial data and their acquisition, analysis, storage and visualization. In this research, techniques from computational geometry and computer navigation systems are combined with the physical indoor space in order to realize the generation of a comprehensive system. The knowledge acquired through various courses of the programme was applied for the purposes of the research and it was further developed. GIS software was used for georeferencing, spatial analysis, visualization and interpretation of the results. This work was also a trigger for the author to obtain new knowledge,

like in Python programming. Additionally, through this research experience was gained in how to deal with the entire process of project management.

The value of this work for the society is detected in the generation of an effective indoor wayfinding assistance system for indoor environments, that is suitable for all types of users. Wayfinding in unfamiliar environments can be a complicated task. Thus, the implementation of such a system can be beneficial in preventing people from getting lost. The high density of decision points populated with the landmark-signs can ensure that people will be able to find their destinations. Moreover, the unique enumeration, which is employed in order to provide all the information, is not only easier in the use but also it might be able to provide an indication of the relative location of the user in the indoor environment. Finally, the techniques used to determine the decision points can be combined with mobile navigation applications as the navigation network is already in place.