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Posudek školitele / Review of the PhD supervisor

Mobile-Based Sensing – Smartphone Application for Long-Term Urban Lifestyle and Mobility Sensing

PhD thesis by Ing. arch. Ladislava Fialka Sobková

Ing. arch. Ladislava Fialka Sobková's thesis deals with the question, how a bottom-up approach to mobile-based sensing may contribute to a better understanding of the dynamics in urban environments. Since a large proportion of the population carries with themselves a smartphone, this is potentially a very large sample group to get valuable information from the sensors embedded in the phones. To obtain the necessary focus in the research topic, Ing. arch. Ladislava Fialka Sobková concentrates on the issue of walking in the city. The background research concerning walking in the city, and why this is an important parameter (in particular for public health) is very systematically and comprehensively analysed in Chapter 3.

The research is divided in two main phases. The first phase deals with data acquisition through mobile phone app; the second phase with analysis of the obtained data.

For the first phase, Ing. arch. Ladislava Fialka Sobková designed the UrbanFit application. The application was developed up through wireframe stage, which is before the final programming phase. This is described in Chapter 4. The possible use of the acquired data is described in Chapter 5. The application was not further programmed, because it turned out that the acquisition of data stored at mobile phone operators is so expensive, that it fell outside any possible research budget.

For the second phase, Ing. arch. Ladislava Fialka Sobková turned to collaboration with Michal Čertický at the Faculty of Electrical Engineering, who worked on an agent-based model of multimodal mobility of Prague and the Central Bohemian Region. This model simulates the mobility behaviour of almost 90 000 simulated urban citizens in Prague. Through the use of this model, Ladislava Sobková could bypass the unavailability of data obtained through UrbanFit. A significant limitation of the simulation model is that it simulates the mobility during one day.

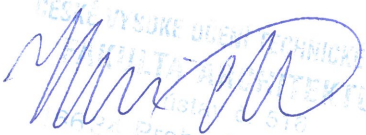
This means that trends over longer connected periods of time cannot be observed. It can be expected (although future research would need to investigate this) that longer periods of time give us more insight in the movement of people in the city.

The different dataset meant that not all parameters intended from UrbanFit could be analysed (most importantly height and weight, necessary for Body Mass Index). On the other hand, it did offer novel data not available from UrbanFit, such as marital status, income, and level of education. This is described in Chapter 6. The outcomes of the analysis made on the basis of the simulation model are described in Chapter 6.3.

To conclude, the PhD research of Ing. arch. Ladislava Fialka Sobková could not fulfil completely the goals set out in the beginning due to unavailability of data from mobile phone operators. Ladislava Sobková solved this problem by using a dataset based on multi-agent simulation. She comprehensively describes the limitations of this choice, and the results from the analysis are well-founded and based on the available data and method. In the discussion and future work, Ladislava Sobková describes the limitations very realistically and shows where next research can be done. Thus in my view, she fulfils all the requirements for a good PhD research. Ing. arch. Ladislava Fialka Sobková has very actively attended conferences where she presented her work on international level. It must be noted that in Scopus, Ing. arch. Ladislava Fialka Sobková's work has been cited 7 times by other authors.

Based on the above, I can conclude that the PhD thesis by Ing. arch. Ladislava Fialka Sobková fulfils all the requirements for a doctorate research, and I recommend her thesis to be passed for the title of PhD.

Yours faithfully,



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