PhD Lecture

In partial fulfillment of the terms for obtaining the PhD degree, Ilkcan Keles will give a lecture on the following subject:

**Spatial Keyword Querying: Ranking Evaluation and Efficient Query Processing**

**on Monday 28th of May 2018, 13:00, in room 0.2.13 at Selma Lagerlöfs Vej 300**

**Abstract:**
Due to the widespread adoption of mobile devices with positioning capabilities, notably smartphones, users increasingly search for geographically nearby information on search engines. Further, an analysis of user behavior finds that users not only search for local content, but also take action with respect to search results. In step with these developments, the research community has proposed various kinds of spatial keyword queries that return ranked lists of relevant points of interest. These proposals generally come with advanced query processing techniques, the goal being to make it possible for users to find relevant information quickly. Most of the proposals employ a simple ranking function that takes only textual relevance and spatial proximity into account. While these proposals study the query processing efficiency, they are generally weak when it comes to evaluation of the result rankings. We believe that ranking evaluation for spatial keyword queries is important since it is directly related to the user satisfaction.

The thesis addresses several challenges related to ranking evaluation for spatial keyword queries. The first challenge we address is forming ground-truth rankings for spatial keyword queries that reflect user preferences. The main idea is that the more similar an output ranking is to the ground-truth ranking, the better the output ranking is. The thesis proposes methods based on crowdsourcing and vehicle trajectories to address this challenge. These methods make it possible for researchers to propose novel ranking functions and to assess the performance of these functions. As such, the thesis makes a step towards more advanced and complex ranking functions that correspond better to user preferences. The contributions of the thesis can also be used to evaluate hypotheses regarding different keywords and geographical regions. Along these lines, it might be possible to employ different ranking functions for different queries in the same system. The thesis also addresses the problem of detecting the visited points of interest in a GPS dataset and proposes algorithms to tackle this problem. These visits offer insight into which points of interest are of interest to drivers and offer a means of ranking for points of interest.

The thesis also formalizes a so-called k-TMSTC query that targets users looking for groups of points of interest instead of single points of interest. Two algorithms based on density-based clustering are proposed to process this query.

Members of the assessment committee are Associate Professor Christian Thomsen, Aalborg University, Associate Professor Maria Luisa Damiani, University of Milan, and Associate Professor Vladimir I. Zadorozhny, University of Pittsburgh. Professor Christian S. Jensen and Associate Professor Simonas Saltenis are Ilkcan Keles’s supervisors. Moderator Associate Professor Kristian Torp.

All interested parties are welcome. After the defense the department will be hosting a small reception in cluster 3.