Wuhan University
School of Computer Science
Semester 3, 2019-2020

Spatiotemporal Data Management and Analytics

Assignment (60%)

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In this assignment, students will be asked to form a group of 3 students to complete a research-focused task on a topic of their choice related to spatiotemporal data management and analytics.

In this course we have discussed some fundamental concepts of spatiotemporal data management and processing. There are still many challenges and open issues in this area in terms of both efficiency and effectiveness, such as high dimensional indexing and search, kNN and skyline query processing, spatiotemporal query processing and mining. Research results on these topics can be found from many recent papers published in leading conferences, such as SIGMOD, VLDB, and ICDE, or journals like TKDE and VLDBJ). You must choose *at least three research papers* published on a topic of their choice that is related to a problem in spatiotemporal data management.

Some of the example research directions are listed below. You can choose one of them or propose a topic of your own interest.

1. kNN: Classic kNN, Constraint keywords, k furthest, Reverse kNN, Continuous kNN, Aggregate kNN, …
2. Skyline: Classic Skyline, Reverse Skyline, Constraint Skyline, Top-k Skyline, Group-by Skyline, …
3. Trajectory: Similarity, Pattern Mining, Compression, Index, Privacy, Map Matching, …
4. Shortest Path Algorithm: Contraction Hierarchy, 2 Hop Labeling, Constraint Shortest Path, Time Dependent / Fastest Path, …
5. Spatial Data Management: Hadoop / Spark / …, Spatial Temporal Data Management, …

Your topic should be chosen carefully, based on discussions among team members and possibly also with the Lecturer. *[Proceedings of these conferences can be found online (using Baidu Xueshu or DBLP), and full text of most papers can be downloaded freely. Should a password be needed, you can (1) find an alternatively source which does not require password; (2) access from Library through university's site licence; and (3) talk to your Lecturer immediately after failing other options.]*

The research report is a document up to 6 pages long that includes/discusses:

1. A clear and concise explanation of the problem
2. Application scenarios for the problem
3. Related work prior to the chosen research papers
4. New solutions proposed in the papers and their relationship with each other as well as other related works
5. Methods used for evaluating the proposed solutions and experimental results
6. Potential issues still remaining for that problem

Your Report

Your report should be submitted as a single PDF file in a format similar to this document. It should be written in English. It should contain a necessary set of references (using the IEEE referencing style).

Assessment

One single score will be given to each group (i.e., all members of a group will receive the same score). However, the lecturer reserves the right to give individual members in one group different scores if issues are raised and confirmed for some non-participating members.

Report Content [40 marks]: The report will be marked as a whole package. The completeness of your work can affect the overall marks of your report. This report is expected to have a good general introduction to the problem and overall cohesion towards your topic [15 marks]; a clear, easy-to-read and self-contained technical section [25 marks] to describe the problem definition and variations as studied in your selected papers, an outline of their key ideas in your own language and their relationship;

Report Presentation [20 marks]: Presentation marks will be given at marker discretion, based on factors including but not limited to report structure, readability, clarity, and referencces.