Major Revision Decision Re: TKDE-2022-06-0887

"Transactions on Knowledge and Data Engineering" <onbehalfof@manuscriptcentral.com>

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抄　送: a.kullu@ieee.org

时　间: 2022-11-4 1:33:00

附　件:

RE: TKDE-2022-06-0887, "Temporal Graph Cube"
Manuscript Type: Regular

03-Nov-2022

Dear Dr. Wang,

We have completed the review process of the above referenced paper that was submitted to the IEEE Transactions on Knowledge and Data Engineering for possible publication and recommend that your paper undergo a Major Revision.

Your reviews are enclosed. We would suggest that you revise your paper according to the reviewers' comments and resubmit the paper for a second round of reviews. If you wish to revise the paper, please do so before 01-Feb-2023.

To revise your manuscript, log into https://mc.manuscriptcentral.com/tkde-cs and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

If you do not intend to submit a revised version of your paper, please let us know so that we can formally close your file.

Please be mindful when making your revisions that you still need to maintain the size limitations for papers submitted to TKDE. TKDE manuscript types and submission length guidelines (including the main text, the abstract, index terms, illustrations, references and bios) are found at,

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Please note that double column will translate more readily into the final publication format. Our peer review double column templates can be found at,

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Text in any color other than black is not acceptable. Your revised paper must include the following:

-abstract
-index terms
-author affiliation information
-main text
-references
-figure captions
-table titles
-brief biography of each author
(biographies are not required for concise papers or comments papers)

I will send your revised manuscript and your revision summary to the Associate Editor and reviewers for comments.

Should you realize that you forgot to include a file before submission, please email it to me at a.kullu@ieee.org. Please do not hesitate in contacting me should you have any questions about our process or are experiencing technical difficulties.

Thank you for your contribution to TKDE, and we look forward to receiving your revised manuscript.

Sincerely,

Amit Kullu on behalf of Lei Chen, EIC
IEEE Transactions on Knowledge and Data Engineering
a.kullu@ieee.org

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Editor Comments

Associate Editor

Comments to the Author:
We have now received three comments from three experts. In general, they found that your submission is very interesting and has sufficient new contributions. However, the reviewers have also raised several concerns on insufficient experimental study, missing related work and unclear presentation of your manuscript. Given these feedbacks, I recommend that this paper goes through a major revision.

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Reviewer: 1

Recommendation: Author Should Prepare A Minor Revision

Comments:
In this paper, authors provide a model for OLAP queries on temporal multidimensional networks. Extending the static graph techniques, they first design the model of temporal graph cube. Then they provide a segment-tree based index, which can accelerate the OLAP queries. And the effectiveness of the index has been proofed in the paper, which is also verified in the experiments. Besides, the author can improve the manuscript in the following ways:
1. The expression of motivation is not clearly. Does the limitation of static graph cube is it cannot support range queries or it only can support latest data?
2. Authors should improve their writing. Especially the punctuation makes the definitions hard to be understood.
3. Authors provide similarity of snapshots and two ratios in the Sec. 5. All of them are calculated based on the edges' number. Why do you use similarity but not two ratios to proof the effectiveness?
4. In the experiments, authors should add an experiment of comparison with existing methods to evaluate the efficiency of their model.
5. The study of related works is insufficient, and some of the results and limitations of existing works are not discussed.
6. The second parameter of MergeSnapshotExtre on Line 11, Algorithm 5 should be (u', v', t, a)?

Additional Questions:
1. Please explain how this manuscript advances this field of research and/or contributes something new to the literature.: In this paper, authors provide a model for OLAP queries on temporal multidimensional networks. Extending the static graph techniques, they design the model of Temporal Graph Cube to support any range queries. Then they provide a segment-tree based index, which can accelerate the OLAP queries. And the effectiveness of the index has been proofed in the paper, which is also verified in the experiments.

2. Is the manuscript technically sound? Please explain your answer under Public Comments below.: Yes

1. Which category describes this manuscript?: Research/Technology

2. How relevant is this manuscript to the readers of this periodical? Please explain your rating under Public Comments below.: Very Relevant

1. Are the title, abstract, and keywords appropriate? Please explain under Public Comments below.: Yes

2. Does the manuscript contain sufficient and appropriate references? Please explain under Public Comments below.: Important references are missing; more references are needed

3. Does the introduction state the objectives of the manuscript in terms that encourage the reader to read on? Please explain your answer under Public Comments below.: Yes

4. How would you rate the organization of the manuscript? Is it focused? Is the length appropriate for the topic? Please explain under Public Comments below.: Could be improved

5. Please rate the readability of the manuscript. Explain your rating under Public Comments below.: Readable - but requires some effort to understand

6. Should the supplemental material be included? (Click on the Supplementary Files icon to view files): Does not apply, no supplementary files included

7. If yes to 6, should it be accepted:

Please rate the manuscript. Please explain your answer.: Excellent

Reviewer: 2

Recommendation: Author Should Prepare A Major Revision For A Second Review

Comments:
D1: The management of snapshots should be described with more details. According to Def. 2, the snapshot is defined with a single timestamps. It looks like that when an edge forms at timestamp t, it never disappears. How do we maintain an edge with time range from t1 to t2? Otherwise, the limitation or applicability of the proposed method should be discussed.

D2: Following D1, in current experimental datasets, DBLP and IMDB, all edges with single timestamps. I suggest adding experiments with datasets which contain edges with time ranges.

D3: The effectiveness of partial materialization is not verified in experiments.

Additional Questions:
1. Please explain how this manuscript advances this field of research and/or contributes something new to the literature.: In this paper, the authors extended graph cube into temporal graph cube by introducing timestamps on each edge. To efficient support temporal cuboid query and temporal crossboid query, they proposed a segment-tree based indexing technique. The experimental results clearly show the effectiveness of the proposed method.

2. Is the manuscript technically sound? Please explain your answer under Public Comments below.: Yes

1. Which category describes this manuscript?: Research/Technology

2. How relevant is this manuscript to the readers of this periodical? Please explain your rating under Public Comments below.: Very Relevant

1. Are the title, abstract, and keywords appropriate? Please explain under Public Comments below.: Yes

2. Does the manuscript contain sufficient and appropriate references? Please explain under Public Comments below.: References are sufficient and appropriate

3. Does the introduction state the objectives of the manuscript in terms that encourage the reader to read on? Please explain your answer under Public Comments below.: Yes

4. How would you rate the organization of the manuscript? Is it focused? Is the length appropriate for the topic? Please explain under Public Comments below.: Satisfactory

5. Please rate the readability of the manuscript. Explain your rating under Public Comments below.: Easy to read

6. Should the supplemental material be included? (Click on the Supplementary Files icon to view files): Does not apply, no supplementary files included

7. If yes to 6, should it be accepted:

Please rate the manuscript. Please explain your answer.: Good

Reviewer: 3

Recommendation: Author Should Prepare A Minor Revision

Comments:

In general, this paper is a good submission, which propose a novel and important concept, temporal graph cube. It has a potential to influence the future research on graph. The segment tree index on answer the queries of temporal graph cube is suitable and effective. I only have two suggestion on improving the paper:
1. The experimental study only tests the proposed methods in this paper. I know the temporal graph cube is a novel problem studied in this paper, thus there is no existing algorithms/methods can direct handle it. However, is it possible to adapt some existing methods on graph summarizing, or static graph cube methods to handle the temporal graph cube problem as some baselines? Through comparing with modified existing methods can better show the advantages of the proposed methods.
2. some minor language issues should be addressed.
E.g., In line 52, left column, page 2. "a index" -> "an index"

Additional Questions:
1. Please explain how this manuscript advances this field of research and/or contributes something new to the literature.: This paper proposes a very novel concept, temporal graph cube, which can support OLAP queries on temporal multidimensional networks. The paper proposes methods that can summarize information of network in any time range of interest. To improve the efficiency, the authors also provide a segment-tree structure to speed up the olap queries. Through experiment on two large real datasets, the efficiency and effectiveness of the proposed temporal graph cube and the segment-tree index are supported.

2. Is the manuscript technically sound? Please explain your answer under Public Comments below.: Appears to be - but didn't check completely

1. Which category describes this manuscript?: Practice / Application / Case Study / Experience Report

2. How relevant is this manuscript to the readers of this periodical? Please explain your rating under Public Comments below.: Very Relevant

1. Are the title, abstract, and keywords appropriate? Please explain under Public Comments below.: Yes

2. Does the manuscript contain sufficient and appropriate references? Please explain under Public Comments below.: References are sufficient and appropriate

3. Does the introduction state the objectives of the manuscript in terms that encourage the reader to read on? Please explain your answer under Public Comments below.: Yes

4. How would you rate the organization of the manuscript? Is it focused? Is the length appropriate for the topic? Please explain under Public Comments below.: Satisfactory

5. Please rate the readability of the manuscript. Explain your rating under Public Comments below.: Easy to read

6. Should the supplemental material be included? (Click on the Supplementary Files icon to view files): Does not apply, no supplementary files included

7. If yes to 6, should it be accepted:

Please rate the manuscript. Please explain your answer.: Excellent