Dear Dr. Shuai Ma,

I have received 3 reviews, included below along with a message from the handling Associate Editor, of your paper entitled "Error Bounded Line Simplification Algorithms for Trajectory Compression: An Experimental Evaluation," which you submitted for publication in the ACM Transactions on Database Systems. We've decided on a minor revision. Since the requested changes are very minor, I'll ask you to please revise the manuscript and resubmit within 2 weeks, by March 21 (if you can't make that let me know). Dr Seeger will look over the revision and if it looks OK, there is no need to go to the reviewers again, so we can hopefully get the result very quickly.

To revise your manuscript, log into https://mc.manuscriptcentral.com/tods 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.

You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using colored text.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Center.

When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

I thank you for selecting TODS to publish the results of your work.

Sincerely,

Chris Jermaine

Editor-in-Chief, ACM TODS

----

# Associate Editor's Comments to Author:

Associate Editor: Seeger, Bernhard

Comments to the Author:

Thanks a lot for the revised version that the reviewers really appreciated. Only reviewer 3 added a few minor points and I would like to ask you addressing them in a (minor) revised version. I think this could be done within two weeks. If not, please get in contact with me for an extension of the deadline.

Reviewer(s)' Comments to Author:

## Referee: 1

**Recommendation**: Accept

**Comments**:

The authors have well addressed my concerns. I have no more questions and recommend acceptance.

Additional Questions:

Relevance to Databases: High

Significance of Contribution: High

Readability and Organization: High

Fusion of Theory and Practice: Adequate

Length (Relative to the useful contents of the paper): Just Right

Please help ACM create a more efficient time-to-publication process: Using your best judgment, what amount of copy editing do you think this paper needs?: Light

Most ACM journal papers are researcher-oriented. Is this paper of potential interest to developers and engineers?: Maybe

## Referee: 2

**Recommendation**: Accept

**Comments**: The authors have successfully addressed my concerns. Thanks for putting efforts to make all the changes.

Additional Questions:

Relevance to Databases: High

Significance of Contribution: Marginal

Readability and Organization: High

Fusion of Theory and Practice: Adequate

Length (Relative to the useful contents of the paper): Just Right

Please help ACM create a more efficient time-to-publication process: Using your best judgment, what amount of copy editing do you think this paper needs?: Light

Most ACM journal papers are researcher-oriented. Is this paper of potential interest to developers and engineers?: Maybe

## Referee: 3

**Recommendation**: Needs Minor Revision

**Comments**:

The authors deserve commendation for the improvements in the revised version.

Since it is getting to the "near-final stage", this reviewer would like to point out a few issues that the authors should address, in order to strengthen the final/camera ready version. None of them is overly complicated - however, the authors are strongly advised to take them into consideration and carefully address them.

1. To clarify the terminology (and history): throughout the paper, the authors are using the terms "simplification" and "compression" intechangeably. This is often the case in the existing literature too - however, it does not do justice to the history. Namely: (a) to begin with, simplification is quite older than computational geometry (and computer science per se') because it traces its origins in the cartography, a few centuiries before inventing the computers; (b) in its original sense, simplification is but one aspect of the problem called "data generalization" in cartography. Namely, often times in practice one would deliberately change the outcomes of a compression/simplification because certain properties (e.g., visibility of objects on the compressed map which, due to a compression ratio and available area would vanish) need to be preserved. Thus, in addition to compressing the spatial (and spatio-temporal) data, there are operators such as "smoothing", "aggregation", etc. - please see [R1] below. Also, the authors may want to check the tutorial on data compression at MDM 2016 [R2]. As an example: one of the main reasons for popularity of the Douglas-Peucker algorithm (despite its higher complexity) is that it generates ouputs which are "visually appealing...".

The authors may want to mention a couple of sentences along these lines in the Introduction, just for the sake of clarifying the scope and context of the work for the readers.

2. Again, for historical "fairness" - often times, the methodologies cited in [10] and [48] in the paper, are jointly referred to as "Ramer-Douglas-Peucker" (part of the reason being that [48] came about the same time as [10], but the authors of [10] were not aware and independently developed an extremely similar idea which, although published (officially) later, became more widely popular). The authors mention both works (and list them in the table) - so they may as well say a few words about this issue.

3. p.6, l.27: Firstly, the definition should be "Point" (not "Points"). Secondly (and more importantly) - the authors state: "...at longitude x and latitude y at time t . Note that these data points can be viewed as points in the x-y-t 3D Euclidean space." This requires a bit of a discussion. To begin with, (latitude, longitude) (augmented with "altitude" in practice) are the most frequent format of recording the point/location data, due to the popular technology. However: (1) to begin with, geo-spatial data is defined by standards (e.g., World Geodetic System 84 (WGS84) coordinates), and the popular GPS-based values are part/consequence of it (e.g., they can be geocentric vs. geodetic); (2) In reality, there is no such thing as Euclidean ones, however, many applications do use them. But, the catch is that when transforming data from (latitude, longitude) to Eucledian (x, y) - there is always an error due to the, so called, map projection (see [R3] below).

Hence, for consistency, the authors are advised to change the definition so that:

(a) it says: "... in a suitable coordinate system."

(b) provide a couple of sentences of a discussion on coordinate system and practice/use.

4. An important recent reference should be included. Namely, while some of the cited works have considered the issue of uncertainty, the work in [R4] is actually focusing on the problem of compressing uncertain trajectories. Thus, in the opinion of this reviewer, for completeness sake, the authors should discuss this context (if nowhere else, then in the "Conclusion", identifying that this is beyond the scope of their current paper.

5. The authors are cautined to read/edit the manuscript very carefully. There are (not too many, but still) typos that need to be corrected. But a couple of examples:

- in multiple places: "Analyses" -> "Analysis"

- p.6, l.36: The sentence "Note that here ..." is unfinished/incomplete.

- may want to avoid starting a sentence with "And..."

**References:**

[R1] Robert Weibel. Generalization of spatial data: Principles and selected algorithms. In Algorithmic Foundations of Geographic Information Systems. LNCS Springer Verlag, 1997.

[R2] Goce Trajcevski. Compression of Spatio-temporal Data - Advanced Seminar. IEEE MDM 2016

(slides available at: http://mdmconferences.org/mdm2016/proadvsem.html)

[R3] Hargitai, Henrik; Wang, Jue; Stooke, Philip J.; Karachevtseva, Irina; Kereszturi, Akos; Gede, Mátyás (2017), "Map Projections in Planetary Cartography", Lecture Notes in Geoinformation and Cartography, Springer International Publishing

[R4] Tianyi Li, Ruikai Huang, Lu Chen, Christian S. Jensen, Torben Bach Pedersen:

Compression of Uncertain Trajectories in Road Networks. PVLDB, 2020

Additional Questions:

Relevance to Databases: High

Significance of Contribution: High

Readability and Organization: High

Fusion of Theory and Practice: Adequate

Length (Relative to the useful contents of the paper): Just Right

Please help ACM create a more efficient time-to-publication process: Using your best judgment, what amount of copy editing do you think this paper needs?: Light

Most ACM journal papers are researcher-oriented. Is this paper of potential interest to developers and engineers?: Yes

----