Journal of Visualization and Interaction
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## Issue #16 (open): [Review] Review 3

@Rmelikyan on Jan 22, 2026 08:38: [opened]

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@Rmelikyan on Jan 22, 2026 08:38:

### Conflicts of interest

- ☒ I declare that I have no known conflicts of interest with the authors.

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### Reviewed version

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### Reviews summarized

# Overview and Paper Summary

This paper presents the development of a new, real-time on the fly, N-body 3D visualization tool which has been implemented within the open source Rebound library which is accessible to any user with a web browser. The major achievements of this work is overcoming the common obstacles of tediously developing platform by platform specific visualization routines or dependency bloat. This is done by implementing their own light-weight web-server and sharing visualization code and simulation data directly with a users web-browser which can then run the visualization code within the browser and leverage WebGL for GPU accelerated interactive visualizations in real time.

## Major Comments

No major revisions are suggested. Beyond some minor comments and line edits listed below, I believe this work is substantial, novel, and informative, and worthy of publication.

## Minor Comments

1. How do these visualization modes compare to a standard heartbeat text output in terms of performance?
2. I find that the hybrid mode, which is the stated focal point of this work, may be overshadowed by the browser mode. This may be due the browser mode simulation inset into this paper. Or that the performance values are the worst of the three, though only slightly. Or that the case for why and when the hybrid option shines for the user is not sufficiently conveyed. Upon reading this work, or reviewing the Rebound documentation pages, a user can easily imagine the value of enshrining the initial conditions of a particular simulation in a "browser mode" HTML page which they could publish to a personal website or share with their colleagues. I find, however, that the case for the hybrid mode isn't sufficiently advertised and worry that it may come across as a novelty rather than a practical advancement. I think there is more room for argument to the merits of real-time visualization as compared to standard text output.
    - I'll note, personally as a Rebound user, how pleasant it is to have such a robust visualization available with such little effort. I hope for this work to fully convey that value added to the user, and, possibly, inspire others to implement similar routines.

3. Footnote 4 suggests a performance improvement in browser mode if multithreading is supported but that there are cases where this is not a safe assumption. Is it possible to include a multithreading flag that the user can set whenever they are generating their own browser mode simulations?

## Line Edits

1. Section 3 Paragraph 6: "static website" -> "a static website" or "static websites"
2. Section 4 Paragraph 2: "Small Simulations" N should b 10^4 not 10^5
3. Section 5 Paragraph 4: "Implement a way" Link is no longer pointing to the expected example, but rather points to the Rebound home page
    - All other links where checked and appear to be pointing to correct pages.

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### Meta-Review

# Review Summary

This paper is well written and concisely shares the latest advancements in real-time visualization solutions through web-browsers. While I do not have the expertise or background to critique the technical details presented in Section 7, as a long-time user of Rebound for modeling and visualization of N-body simulations, I am eager to see this work published and am complimentary of the continued effort the author invests into their community.

## Suggested Changes

Minor point 1: If easy, amending table 1 with performance metrics for simulations without visualization enabled.

## OrcID:

https://orcid.org/0000-0003-2018-3273

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### Decision

Endorse: I am willing to endorse this paper, with at most minor copyediting.

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@hannorein on Jan 23, 2026 20:30:

@Rmelikyan Thank you very much for the review!

1. I did a few more tests and have expanded the table as requested. da3ec48
2. Line edits have been implemented. ee939f0
3. Regarding whether the hybrid more is advertised enough. I think especially the abstract already makes a strong point. I've slightly modified it. 8d63ea8
4. Regarding Footnote 4 and COOP. Right now REBOUND does not make use of multithreading within the browser but this could be implemented in the future. I'm not sure about the complexity involved in getting this working. Given that the product would not be able to run on many website (readthedocs, university hosted websites, etc), I don't think this is worth the trouble right now.

I hope this addresses all issues from the review.

@floe Let me know if you want me to do anything else and what the next steps would be!

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@floe on Jan 25, 2026 11:05:

Thank you both @Rmelikyan and @hannorein! I think this paper is now ready for official publication in JoVI, given that all review comments have been addressed - I will write a metareview early next week and then push it through our publication system at AAU.

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@Rmelikyan on Jan 26, 2026 23:33:

@hannorein I think the additions to the table really drive home the point and success of the hybrid

method. I'm glad to see this update. I've caught a new typo in the additional paragraph which you added

> The fastest simulations are if course

should be "of course"

> but still take at most twice as long to run

This reads awkwardly. I suggest "but may take up to twice as long to run" or something similar.

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@hannorein on Jan 27, 2026 00:04:

@Rmelikyan Thanks for catching that! Fixed in 9b3dc8f.