Decision letter (Initial Submission)

IEEE Access - Decision on Manuscript ID Access-2022-06028

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22-Apr-2022

Dear Dr. FOUCHER:

I am writing to you in regards to manuscript # Access-2022-06028 entitled "Simulation and Classification of Spatial Disorientation in a Flight use-case using Vestibular Stimulation" which you submitted to IEEE *Access*.

Please note that IEEE *Access* has a binary peer review process. Therefore, in order to uphold quality to IEEE standards, an article is rejected even if it requires minor edits.

Your manuscript has not been recommended for publication in IEEE *Access* in its current form; however, we do encourage you to address the concerns and criticisms of the reviewers detailed at the bottom of this letter and resubmit your article once you have updated it accordingly.

Please revise your manuscript based on reviewers' feedback and resubmit; elaborate on your points and clarify with references, examples, data, etc. If you do not agree with the reviewers' views, then include your arguments in the updated manuscript. Also, note that if a reviewer suggested references, you should only add ones that will make your article better and more complete. Recommending references to specific publications is not appropriate for reviewers and you should report excessive cases to ieeeaccessEIC@ieee.org.

We highly recommend that you review the grammar one more time before resubmitting. IEEE offers a 3rd party service for language polishing, which you may utilize for a fee: https://www.aje.com/c/ieee (use the URL to claim a 10% discount).

Please be advised that authors are only permitted to resubmit their article ONCE. If the updated manuscript is determined not to have addressed all of the previous reviewers' concerns, the article may be rejected and no further resubmissions will be allowed.

When resubmitting, please submit as a new manuscript via our submission site, the IEEE Author Portal, and include the following 3 files:

1) A document containing your response to reviewers from the previous peer review. The "response to reviewers" document (template attached) should have the following regarding each comment: a) Reviewer's concern, b) your response to the concern, c) your action to remedy the concern. The document should be uploaded with your manuscript files as a "*Supplementary Material for Review*."

2) Your updated manuscript with all your individual changes highlighted, including grammatical changes (e.g. preferably with the yellow highlight tool within the pdf file). This file should be

uploaded with your manuscript files as a "*Supplementary Material for Review*."

3) A clean copy of the final manuscript (without highlighted changes) submitted as a Word or LaTeX file, and as a PDF, both submitted as the "*Main Manuscript*."

We sincerely hope you will update your manuscript and resubmit soon. Please contact me if you have any questions.

For more information on successfully publishing within IEEE *Access*, please see https://youtu.be/502WPjDhY_0

Thank you for your interest in IEEE *Access*.

Sincerely,

Dr. Aasia Khanum
Associate Editor, IEEE *Access*
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Reviewers' Comments to Author:

Reviewer: 1

Recommendation: Reject (updates required before resubmission)

Comments:
This paper presents a study to isolate, simulate and recreate realistic aspects of vestibular feedback dead-reckoning piloting task to and estimate the SD using joystick response feature.

I would appreciate authors efforts for presenting their work in this article.

* Fore mostly, I would suggest authors to consider a thorough formatting correction to improve the overall readability of the article. For instance, Second paragraph of Experimental design section is out of order in terms of its formatting. Please check.
* Consider to follow IEEE Access reference style. List all references numerically in the order they've been cited within the paper. For instance, check the citation order in line 2 of second column in page one. It seem to be not matching the style here. ([2],[3],[4],[1],[5],[6]).
* I would suggest authors to revisit figure captions and use it effectively. (long captions shall be avoided wherever applicable)
* The motion simulation system and the participants details are clearly explained and enables the reproducibility of the proposed work presented in this article.
* I would suggest authors to use larger image for Figure 3. (for better visual from readers perspective)
* The analysis section seem to be well done effort as the measured data is numerically confirmed and checked for defects.
* The response categorization and detection performance seem to provide conclusive evidence for the user experience experiment conducted in this study.
Please check equation 1. Seems like an image. Please follow the journal template to add equations.
* Authors also have provided an useful evaluation details for the classification model.
* The result section looks good.
*The conclusion section seem to be extremely lengthy. I would suggest authors consider a discussion section to highlight the findings and list out the advantages of the study made in this article. Also indicated the limitations of this study followed by conclusion.

Additional Questions:
1) Does the paper contribute to the body of knowledge?: Yes

2) Is the paper technically sound?: Partially Yes. This paper presents a study of an in flight piloting use case experiment and ML model prediction.

3) Is the subject matter presented in a comprehensive manner?: Partially Yes. Although paper is presented in a easy-to-read manner, there are some concerns with respect to presentation style (lengthy paragraphs) and format.

4) Are the references provided applicable and sufficient?: Superficially yes. However, Recent times milestone paper seems to be missing in the reference list. I would suggest authors consider latest publications on similar grounds.

5) Are there references that are not appropriate for the topic being discussed?: No

5a) If yes, then please indicate which references should be removed.:

Reviewer: 2

Recommendation: Reject (updates required before resubmission)

Comments:
This paper investigates Spatial Disorientation(SD) in a generalized manner. First, the study creates a generalized SD perception dataset using whole-body motion detection methods in a naturalistic flight context. Second, SD prediction was explored using Machine Learning(ML) techniques. The conclusion is that no significant relationship between physical disorientation and motion detection was found.

The paper targets an interesting topic. I only have one major concern and multiple minor suggestions.

Major concern:

Given only traditional ML model was applied, the conclusion "no significant relationship between physical disorientation and motion detection was found." might be true. However, what about some deep learning model? I don't think the 2-layer NN mentioned in the paper should be identified as a deep model. I think the discussion of deep learning models will be helpful. If not, deep-diving into the reason why physical disorientation and motion detection is not strongly related is necessary.

Minor suggestion:

1. Introduction is too long and hard to follow. I suggest dividing it into two parts, introduction and related work.

2. For related work, authors can talk about some other applications that use IMUs/motion detection. It is helpful for readers to understand this field. For example, [1-3] are some high-impact applications including gait monitoring, human pose estimation, and human activity recognition using IMUs.
1. An, Sizhe, et al. "Mgait: Model-based gait analysis using wearable bend and inertial sensors." ACM Transactions on Internet of Things 3.1 (2021): 1-24.
2. Von Marcard, Timo, et al. "Sparse inertial poser: Automatic 3d human pose estimation from sparse imus." Computer Graphics Forum. Vol. 36. No. 2. 2017.

3. Xiao, Fanyi, et al. "A deep learning method for complex human activity recognition using virtual wearable sensors." International Conference on Spatial Data and Intelligence. Springer, Cham, 2020..

3. Conclusion is too long and hard to follow. I suggest dividing it into two parts, discussion, and conclusion.

Additional Questions:
1) Does the paper contribute to the body of knowledge?: Yes

2) Is the paper technically sound?: Yes

3) Is the subject matter presented in a comprehensive manner?: Somewhat

4) Are the references provided applicable and sufficient?: Somewhat

5) Are there references that are not appropriate for the topic being discussed?: No

5a) If yes, then please indicate which references should be removed.:

If you have any questions, please contact article administrator: Mr. Nishant Shukla
n.shukla@ieee.org