

Peer Review Form for Scientific Articles AE2223-I

Fill in this form by typing, not by handwriting. Adjust space to need. The criteria correspond to those mentioned more elaborately on the checklist scientific articles, to be found on Blackboard. Use that checklist for a more elaborate description of the criteria.

Elements
1. Abstract Readable as stand-alone text – Informative on research and results – Clear key words
Comments: Clear and concise abstract which can be read as a standalone text. The knowledge gap and motivation for research is immediately clear, as well as a short description of the methodology used. Perhaps you could be more specific and mention the metrics used in the article so that those that are reading your article for research can quickly determine if it is relevant to them or not (although the metrics are in the key words, which is good). The abstract is missing some description of the results of your research and recommendations for further research. Since further research would involve improving on the tool developed in the article, perhaps it would be helpful to briefly touch on what limitations exist in the current version of the tool (mentioned in the discussion section). Key words are clear and correctly formatted. Small note: typo on "aircraft" in key words.
2. Introduction Background information on problem – Clear motivation for research – Research question stated clearly – Structure article discussed if necessary
Comments: Motivation for research is immediately clear; mentioning health effects also draws more concern for the issue and makes it seem like an important issue. The background information (eg. The Schiphol Landscape Design Plan) is helpful for the reader to understand the implications and scale of the issue; this example also makes the issue more concrete and clear to understand. You mention in the third paragraph that a knowledge gap exists in quantifying metrics, but also that methods for quantifying these metrics are found in references [7], [8], and [9]. This is a little confusing to me. It seems to me that the knowledge gap exists in the sense that no tool exists that can determine if the sound annoyance is great enough to warrant preventative action by the airport, simply by analyzing raw noise input data (i.e. not only determine the metric, but determine a "critical" point (or range) of annoyance levels). If methods for calculating the metrics already exist, where is the knowledge gap? Perhaps this part can be reworded. The research question is very clearly stated in the form of a purpose statement. Structure of the article is stated, but as advised in the scientific writing course, this is not completely necessary when the AIMRaD structure is used. The last paragraph of the introduction is therefore helpful, but not necessary. Data Processing Section: Very clear and informative, but reads a bit like a method section in my opinion. Perhaps you could describe in more precisely which values are measured and which are calculated (eg. Is the speed of the aircraft directly given as raw data from the optical camera, or was this calculated using position measurements?). The sampling frequency or number of measurements taken with the optical camera would also be helpful to include in my opinion (if that information is available).
3. Method Well-argued – Sufficient definition of concepts – Connection to research question

Comments:

The flow chart used to summarize the method was very helpful in my opinion; it helps to visualize the different steps and how they help reach the overall goal of the analysis. The first two paragraphs in the method section serve as a good overview of what's to come; it makes the rest of the section easier to understand.

Section A:

Each of the corrections are very well explained, but the reason for including them (and omitting others) is not quite clear. For example, why are the four corrections mentioned in the article used, and not a correction for temperature and wind gradients or surface effects? The effect of wind gradients on sound propagation seems especially important on an airport runway where aircraft wakes and vortices are likely present, along with regular atmospheric wind gradients. The same holds for temperature gradients (as it seems the equation used for AAC assumes constant temperature) and surface effects. Perhaps the impact of these effects are small compared to the ones mentioned in the article, but if so, it may be worth mentioning this to show that you considered these effects.

All equations used are referenced to in the text body, which is good.

In the GSC section, the decided value of r_0 could use a unit (1 meter I'm assuming)

Something I'm not clear on is why these data corrections must be applied. I understand that these effects distort the original sound of the aircraft, but since people live on the ground, would it not make more sense to leave these effects in so that the annoyance level can be measured as a ground observer? If these effects are taken into account, aren't you just measuring the sound of the aircraft and not how this sound would be perceived by, say, a small town close to an airport? Would it not be more useful for airports to know how "annoying" the sound is on ground level with background noise etc.? I'm sure you have the correct method but the reason for isolating these effects could perhaps be clarified.

Section B:

Figure 2 is helpful for visualization. Needs a citation in the caption. The bottom axis label also seems to be cut off in the picture.

Sharpness: perhaps make it more clear where equations 8 and 9 come from; are they also from [11]?

Psychoacoustic Annoyance: Third sentence is missing an object, perhaps it could be revised to read "The use of this metric enabled the prediction of ____".

In the third paragraph of the PA section, it seems to me like the sentence should read "Hence, assuming high values of **loudness**, sharpness is the leading term" with loudness instead of sharpness.

All around, section B is very informative and concise. Figure 3 is helpful for visualizing the leading terms for PA together with equations 13 and 14. Did you make figure 3 yourself? If not, it needs a citation in the caption.

Is there a way to define/describe "annoyance" without using tonality, sharpness etc.? The word is used quite frequently, so maybe a definition might be useful.

In the PA section, it is stated that "A more in depth sensitivity study can be found in section V." Section V is the conclusion section.

Maybe it would be a good idea to use different symbols for speed of sound and the proportionality constant (both c)

4. Results and discussion

Results presented clearly - Validity of results discussed and supported – Relation text/illustrations clear

Comments:

Nice introductory paragraph to precede the results.

I'm a bit unclear on the second sentence. To me it is vague what is meant by "ranking": are you ranking the importance of each parameter or ranking the aircrafts in terms of these parameters? Maybe both? The former sounds like what you did in the sensitivity analysis, while the latter seems like what you did in Table 1. This could perhaps be clarified more. Also I am unclear as to why a "ranking" would help "gauge the relevance of each sound parameter in sound annoyance"; is this not what the sensitivity analysis is for?

Regarding Table 1, it should be referenced to somewhere in the text body. Also, why does aircraft 8 have no tonality value? This should be explained somewhere. The ranking of metrics seems out of context to me: are these the same aircraft type just at different flyovers or completely different altogether? It seems pointless to rank these aircraft by loudness, sharpness, and tonality given only a classification number. If you have some sort of distinct difference between the aircraft (engine position, size etc.), then this ranking could show an interesting relationship, but I cannot derive much information from this table given that the aircraft are just arbitrary. Either way, it may be easier to read if each column had values in descending order so that the order of ranking is more obvious. I guess the purpose of this research was to make a tool to calculate metrics for flyover noises, which is shown in the table, but how is it possible to validate these results? After all, the most annoying aircraft does not have the highest ranking in all metrics.

Why is the Tonality value for aircraft 4 so small compared to all others?

Also in Table 1, no overall annoyance level is present for each aircraft. I understand PA could not be computed without values for F and R, but your purpose statement states that the program should "return a level of annoyance."

It seems like a better idea to put the results of the sensitivity analysis in this results section; it is one of your results after all. It seems strange to reference to the appendix for crucial information (typically appendices contain supplementary material).

Some grammar mistakes and informal language is present, in my opinion. Words like "a lot" and "bigger" sound informal (to me at least).

3rd paragraph: a sentence starts with "and."

4th paragraph: perhaps consider changing "isn't" to "is not."

5th paragraph: relative —> relatively.

In the third paragraph, the strange results are presented in an almost positive way. In my opinion, this part should be reworded to sound more explicitly like a limitation of the method (these limitations must be presented in this section after all).

Overall, the results could perhaps be presented more clearly and the validity and importance of these results could be discussed in more detail.

5. Conclusions

Link to research question – Follow from previous material – Recommendations further research

Comments:

Links back to research question well (but still unsure if the program actually rates the overall annoyance level or not...).

Good summary of method of analysis.

A summary of Table 1 is given, but perhaps more can be discussed on the implications of these results.

Also, how was it determined that aircraft 2 was the most annoying without values for F and R? Was it just adding up the loudness, sharpness, and tonality values? Lowest sum of rankings? It seems to me that aircraft 3 would be the most annoying...

Good recommendations are given; it touches on some of the comments made in the results feedback. I especially like the last sentence.

Section does follow logically from previous material.

Perhaps discuss to what extent the research question has been answered or how these results can help solve the issues presented in the introduction.

Acknowledgements are good.

Reference use**6. Use of sources**

Correct references – Good use of literal quotes – Good use of paraphrasing

Comments:

No literal quotes so no comments about those.

All paraphrasing looks good and are referenced correctly

Source of figures need to be included in the caption (eg. In figure 2, assuming you didn't make it)

7. Bibliography

References meet requirements – Correspondence references in text and bibliography

Comments:

Reference page looks good and in the correct order. Sources look reputable and recent.

All sources are referenced to in the text, except for [15] which is referenced to in the bibliography.

Content**8. Data analysis / research sufficiency**

Your opinion on the data analysis and research sufficiency

Comments:

The metrics chosen are relevant and the methods of calculation are well supported by literature. These metrics were able to be calculated from raw noise data, which was the goal of the tool. The final results, however, don't tell much of a story in my opinion. Ranking the aircraft by each metric seems pointless to me unless there are defined differences between them. The table seems more like proof that the tool works instead of showing a trend. In this way, the research does not seem sufficient to me and will definitely require further research. The purpose of the tool seems to be not only measuring these metrics, but also define a threshold after which the annoyance level is too large and should be mitigated by the airport. The research presented takes the first step in this, but one cannot interpret the results properly yet.

On the same note, the conclusions presented (in the conclusion section) does not seem to have much meaning outside of this specific experiment. Aircraft 3 has the largest loudness and tonality value but what does this mean for airports? What about that specific aircraft causes this?

Overall, the analysis method is good, but the research results do not seem very sufficient to me without further studies being conducted. The results do, however, match the purpose statement of the paper (minus returning an overall annoyance level).

9. Argumentation

Your opinion on the academic value of the argumentation – Critical review of literature

Comments:

It is a bit strange to comment on argumentation since there was not a hypothesis to confirm/deny or a question to answer. The purpose was more to create a tool for sound analysis, which was done. This result therefore does not require much argumentation.

One aspect of argumentation that is missing is how it was determined which aircraft was the most annoying overall (in the conclusion).

Literature is used in the method (using $c = 0.11$). Perhaps you could be more critical of this value. Do other models exist for sharpness and tonality? If so, maybe explain why these ones are used specifically.

Structure**10. Paragraphs**

Well-constructed – One topic – Clear topic sentences – Clear paragraph structure

Comments:

Clear, well constructed overall structure (AIMRaD).

Paragraph structure is very clear with the use of sub-headers.

Sections have an introductory paragraph that acts as a topic sentence for the section.

Paragraphs are of a good length.

Style**11. Style and language use**

Correctness – Objectiveness – Clarity – Attractiveness

Comments:

Overall good grammar, with the exception of some errors.

Wording is objective.

Some sentences could use some more precise language (avoid some ambiguous wording)

Sentences are not too complicated or long.

Illustrations and layout

12. Tables and figures

Functionality - Number and caption – Reference in text – Reference to source – Legend/
explanation

Comments:

All figures are functional and aid in understanding the text.

All figures contain numbers and captions.

Some figures require citations in the caption.

All figures are referenced to in the text, except for Table 1.

Figure 2 could perhaps use a more descriptive caption.

Some issues may arise if figure 2 is printed in black and white.

13. Format

Font – Headings – Page lay-out – Adherence to template

Comments:

Font style and size is functional.

Headers and sub-headers are very helpful and easily recognizable.

Page layout is attractive and adheres to the template given.

I am unsure whether we can include "American Institute of Aeronautics and Astronautics" in the footer...