

Reproducibility review of: Evaluating and Comparing Airspace Structure Visualisation and Perception on Digital Aeronautical Charts

Rémy Decoupes 

2023-06-02



This report is part of the reproducibility review at the AGILE conference. For more information see <https://reproducible-agile.github.io/>. This document is published on OSF at <https://osf.io/rbgvk/>. To cite the report use

Decoupes, R. (2023, March 16). Reproducibility review of: Evaluating and Comparing Airspace Structure Visualisation and Perception on Digital Aeronautical Charts

Reviewed paper

Sarbach, A., Weber, T., Henggeler, K., Lutnyk, L., and Raubal, M.: Evaluating and Comparing Airspace Structure Visualisation and Perception on Digital Aeronautical Charts, AGILE GIScience Ser., 4, 12, <https://doi.org/10.5194/agile-giss-4-12-2023>, 2023

Summary

The purpose of the reviewed article is to evaluate and compare airspace structure visualization and perception on digital aeronautical charts. To do so, the authors propose two ways. The first one aims to define an evaluation grid on which they rely, as experts, to establish a cartographic analysis (they authors provide an access to their analysis). The second is a survey of 27 airplane pilots to collect their perceptions about different maps.

Therefore, the reproducibility review process focused on reproducing the result visualizations of both analyses (the experts and the survey). To do so, the authors shared manually constructed data files as well as code files to reproduce the figures. The provided code and data allow to **fully and easily reproduce** the three figures of the reviewed article. However, we suggest that authors guarantee long-term access to their materials by using a public data warehouse in order to obtain a DOI. We also suggest that the authors provide additional information about the origin of the data files.

Reproducibility reviewer notes

1. Installation

1.1 Download the code and the data

The authors provide a link to download data and code: <https://polybox.ethz.ch/index.php/s/x0pLRq60DnoXTvJ?path=%2F>

Inside this repository, we found:

- Two PDF files:
 - The Chart Analysis (manually conducted by the authors)
 - The Survey proposed to the 27 pilots
- A CSV file:
 - The survey results (**Survey Results.csv**)
- A folder “Figure Reproduction” with three couple of csv and python files:
 - medium.csv and medium.py: for reproducing Fig. 9
 - orientation.csv and orientation.py: for reproducing Fig. 8
 - visualisation_effectiveness.csv and visualisation_effectiveness.py: for reproducing Fig. 6

I needed explanations from the authors to understand how the three csv data files were built. After exchanges, I understand that:

- Medium.csv: comes from the survey results, **Survey Results.csv**: column J
- Orientation.csv: comes from the survey results, **Survey Results.csv**: column L
- Visualisation_effectiveness.csv: comes from the Chart Analysis (manually done by the authors). Data have been interpreted by the authors: they have rounded the numerical values according to the free comments and they have slightly weighted some categories that were more important for the analysis.

1.2 Creating the python environment

```
conda create --name agile_2023_2519
conda activate agile_2023_2519
conda install pandas
conda install matplotlib
conda install seaborn
```

2. Running the scripts

In the folder Figure Reproduction, the authors provide three scripts.

2.1 Visualization effectiveness

The script bellow reproduces the fig. 6 in the manuscript (see Figure 1.)

```
python visualisation_effectiveness.py
```

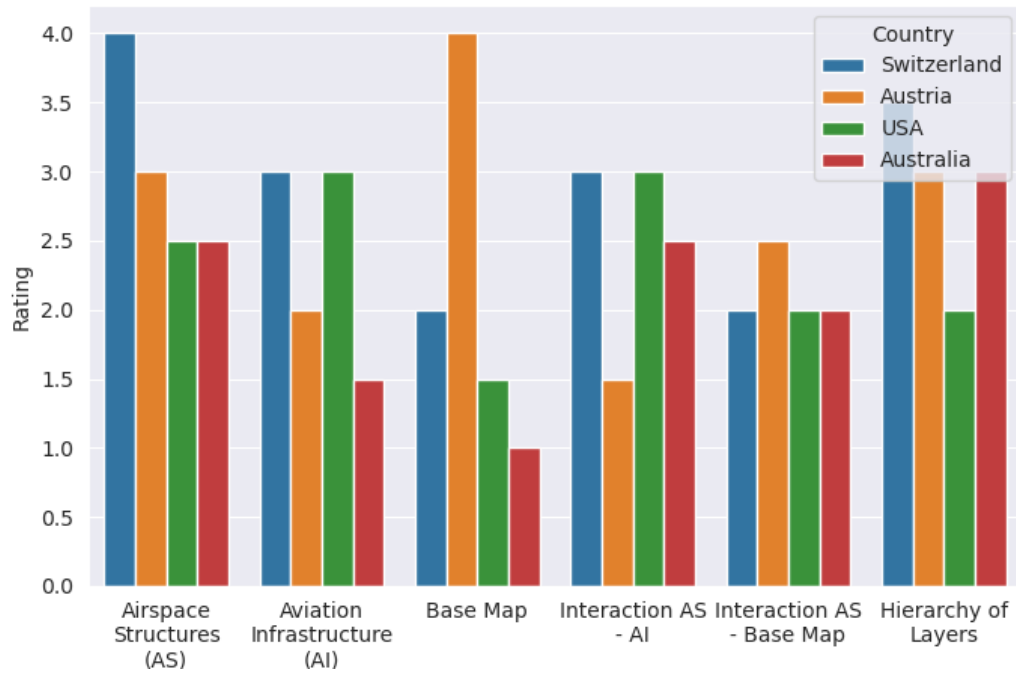


Figure 1. Visualization effectiveness corresponding to **Fig. 6** in the manuscript

2.2 Medium used

The script bellow reproduces the fig. 8 in the manuscript (see Figure 2.)

```
python medium.py
```

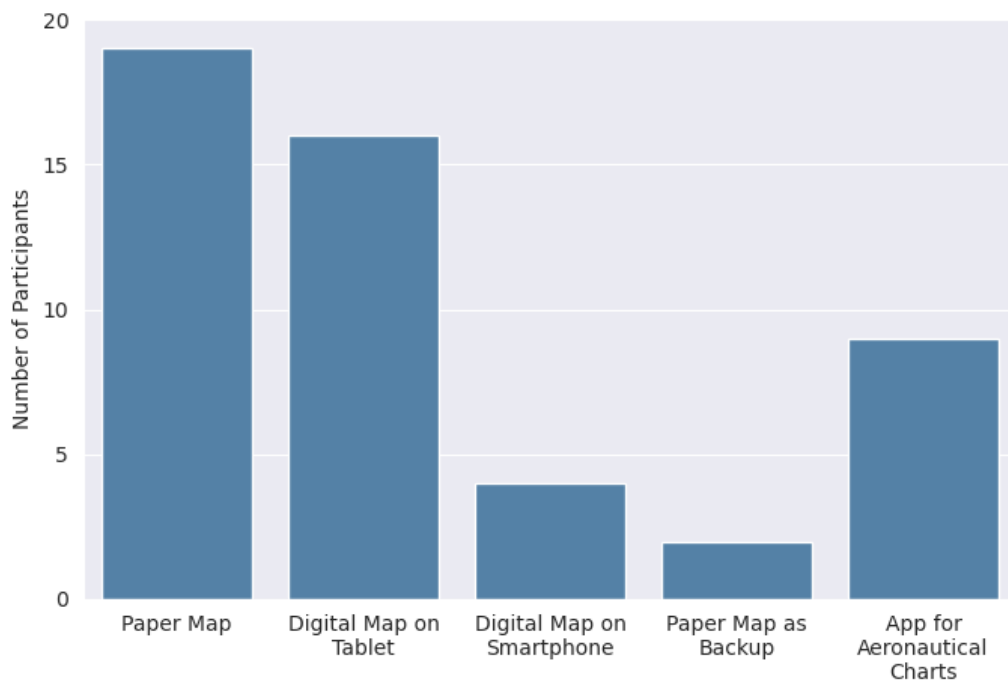


Figure 2. Medium used for viewing the aeronautical chart corresponding to **Fig. 8** in the manuscript

2.3 Features used for orientation

The script bellow reproduces the fig. 9 in the manuscript (see Figure 3.)

```
python orientation.py
```

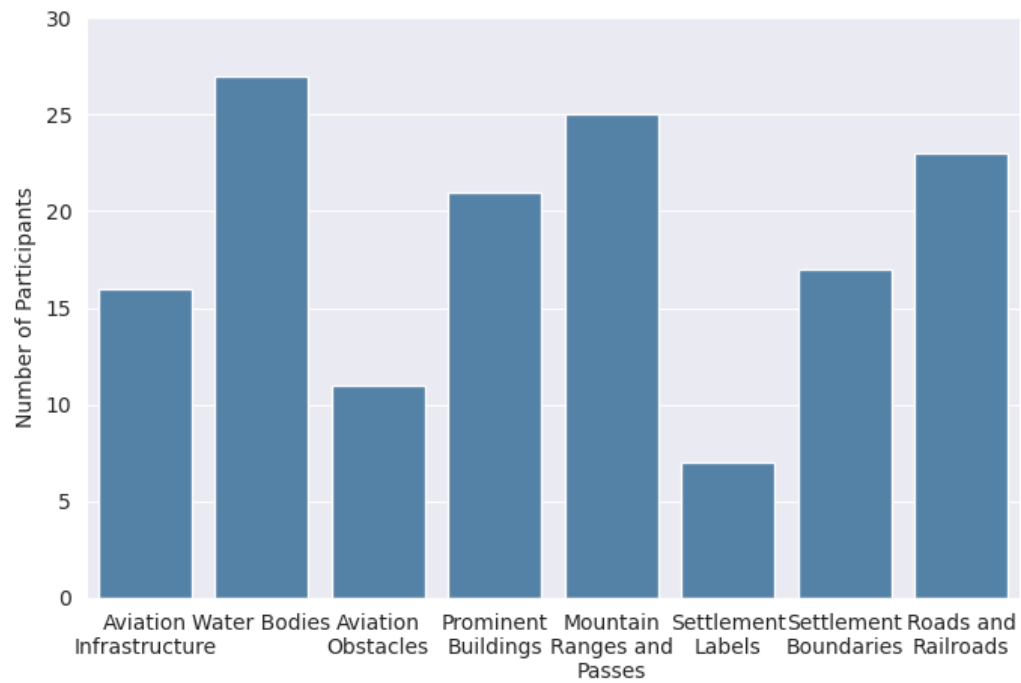


Figure 3. Features used for orientation corresponding to **Fig. 9** in the manuscript

3. Suggestions

3.1 Long-term access

I am concerned that the link provided by the authors to access the code and data does not guarantee long-term access. Indeed, the authors used their institutional data sharing platform and not a public data warehouse. **I suggested and I renew this suggestion:** the data and the codes should be uploaded in a data warehouse that assigns DOI like Zenodo for example. This way a permanent access would be guaranteed and the materials would be easily citeable.

3.2 Code and data description

It was not easy for me to understand the origin of the three csv files (medium, orientation and visualization effectiveness). I needed to exchange with the authors to understand how these files were built and how they fit in the article's approach.

This is why I also suggest that the authors upload their data and scripts to a data warehouse and add a description for each files.