

AGILE PhD School Report: Key Takeaways

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Abstract

A good way of documenting the research is by depositing the related information in an online repository.

1 Visualization

1.1 Gif vs. interactive animation

- Gif (short animation) is straightforward and self-explaining. It quickly **drags users' attention** and motivates them to engage with the data exploration.
- Gif is convenient because the data processing and comparison was already done and the results are visually communicated to easily understand the dataset behavior and grasp the main information **without having to interact with the dataset.**
- Interactive animation **requires users' action** to interact with the dataset, which makes it more time consuming.

Conclusion: use gif to drag users' (or readers') attention, and interactivity to enable user to do further data exploration.

E.g., this gif *Alaska Ice Melting* visually shows historical ice level changes without adding too much information on it.: https://github.com/agilephdschool2019/mzahtila_agile_phd_school/blob/master/alaska_ice_melt.gif

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1.2 Visualization design

- Hints: Use predefined color palletes to shorten your work. Try to get inspiration from really nice designs.
- GIS software is convenient for quick understanding of spatial spread of geo-located data.

2 Reproducibility

- A good way of documenting the research is by depositing the related information in an online repository.
- Well structured and maintained repositories ensure high reproducibility. (Reproducible papers are cited more often.)
- The reproducibility-related information should include properly described research methods, citing (or providing) data used, describing the implemented procedures, software and its settings - up to a reasonable extent (neither too basic nor too detailed).
- The related citing in the paper should state: *release version, Url, and DOI.*
- My Github repository: <https://github.com/mzahtila>
- Always include license statement!

3 Science Communication

- Results are the most important part of the paper.
- Try writing the abstract first: This helps in creating the structure of the paper, and defining what it will tell.
- Always imagine how would others interpret or perceive my research (article, presentation) - It might be different from my own ideas.

- Consider the article (and research) as a story: Define the story elements in advance.
- Consider Brown's 8 questions.

3.1 Telling a story with the article (applied to my current research)

1. Plot: supporting decision making by visual perception of numbers.
2. Main character: social media data, or even more specific, social media data in numbers.
3. Research gap: (1) visual analytics tools mostly do not approach visual comparison of data as a separate user task, but indirectly (2) scientific visualizations are often very complex, and require training for using and understanding them.
4. Solution: approach visualization of numbers that relate to a specific location in a novel way, which can be intuitively understood, and compared.
5. Results: should imply intuitive perception of statistics, which can be challenging in tabular representations.

3.2 Structuring the paper/research according to Brown's 8 questions:

1. Frank Ostermann (social media, academic), Manuel Lima (visualization, professional, *Visual Complexity*), Michael Lee Gleicher (visualization, academic, *Task-Driven Comparison of Topic Models*)
2. I have thought of ways of how to visually represent geotagged numbers as gifs, namely from social media posts, in order to use them as additional explanatory element on a map. **I will consider the usefulness of GIS approach for processing the data and generating the first visualization ideas.**
3. Gifs, or short animations, are straightforward and self-explaining animations that quickly drag users' attention and motivate them to engage with the data exploration.
4. I tried GIS approach because **GIS tools do not require coding for data processing**, and it is a quick way to visually show the distribution of data and play around with different visualizations.
5. In theory, the research method used should bring a novelty of communicating statistical data.
6. In practice the visualization should support experts and citizens in decision making.

7. The key benefits are quick understanding of targeted information of complex datasets that help in the decision making process.
8. One of the next steps would be to **implement ideas developed in GIS as interactive tools** and do usability tests to make conclusions on the results.