Explorable Scrollytelling Project Report

Motivation

In recent years, online publications have been increasingly making use of interactive data visualisations ([The New York Times, 2018] and [The Pudding, 2018] for example), and they also play a large role in communication of academic research results, among other areas. However, this increased reliance on data visualisations is not without challenges: "In mass media, data visualization literacy is also limited. Readers need guidance and clarity. A crucial effort and attention is to gradually deliver an even slightly above the average visualization in terms of complexity.", states [Corbeil et al., 2019], a case study of using data visualisation for an election news story. Indeed, it is essential that readers are able to interpret the visualisations correctly, and this is all the more made important due to the proliferation of dishonest data visualisations that are designed to mislead, as exemplified by "A History Of Dishonest Fox Charts" article ([Media Matters, 2012]).

Unfortunately, there is currently a lack of resources for teaching specific data visualisation concepts, especially in an interactive and engaging way. If these resources existed, they could be a teaching support for teachers and online publications, and enable their users to strengthen their understanding of visualisation techniques. This was the motivation behind our Our DIP Project, "Explorable Scrollytelling" [Plankyte, 2020], in which we explored one form that these interactive resources could take, and reflected on their content, narrative flow, and overall platform. Concretely, we used [Wang et al., 2020]'s visualisation cheatsheets as a basis to design and prototype a webpage that enhanced the explanation of boxplots with interactivity and animations, as well as conceptualising an authoring tool that could host these webpages and provide users with sharing and editing capabilities. In this dissertation, we are wish to build upon the existing work, in order to develop a more concrete concept for data visualisation explainer webpages.

Project goals

During the DIP Project, we realised that the webpages (and as a result, their components) need to be adaptable to the context of use (data, domain language, scenario, level, purpose), which most likely would require the creation of an authoring tool to facilitate editing these webpages. To ease the development of a potential authoring tool, the components would need to be modular and consistent across webpages, so that they could be generalised into a component library. Having this modularity in components would also improve the structure of the webpages. As a result, different component types have to be explored in terms of possible uses, features such as interactivity, usefulness in teaching, and generalisability, in order to define a set of flexible components for implementation.

Consequently, our aims are as follows:

- Through the literature review, to define a design space for our project, and define which aspects we will explore in order to be more focused in our work by restricting the scope of our investigations
- To iterate on the design of components, by exploring different types of interactivity, animations, and evaluating the educational usefulness of components. This is achieved through iterative user feedback sessions, which are paired with the implementation of new features into the boxplot visualisation page developed in the DIP Project, as well as the

storyboarding of visualisation pages for new visualisation types. This results in a high-level design pattern collection, which summarises the various techniques used for efficient teaching of data visualisations.
- Through the improvement and refactoring of the prototype and its components, to investigate the generalisability of components across different visualisations, and to conceptualise the code structure and features of a JavaScript library for interactive components.

Together, these project goals can be summarised under the following research question: **"What is a set of interactive components for an explorable scrollytelling website that are editable, multi-purpose and generalisable, as well as effective for teaching?"**

Summary of work

The following is a summary of the outcomes of the project:

- A design space for explorable scrollytelling (done)
- An improved boxplot website, with new features informed by user testing (in-progress)
- Storyboards of webpages and their interactive elements and transitions for new visualisation types (in-progress)
- User testing results regarding usefulness of components for learning (to-do)
- An overview of the components and design patterns that emerged from the prototyping and storyboarding (to-do)
- A concept for a JS framework that facilitates use and editing of components (in-progress)

References

[Corbeil et al., 2019] Corbeil, J.-P., Daudens, F., and Hurtut, T. (2019). Data Visualization+ Scrollytelling for Election News Stories: Challenges and Perspectives.

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[Wang et al., 2020] Wang, Z., Sundin, L., Murray-Rust, D., and Bach, B. (2020). Cheat Sheets for Data Visualization Techniques. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, pages 1–13.