Dataprocessing
Reading 5 - Mounir Hader

1. Ware argues that human perception involves 2.5 dimensions. Given this assertion, when might a 3D visualization be useful and why?
The *0.5-dimension* refers to the *away* dimension. According to Ware, image-plane (*up-down* and *sideways* dimensions) sampling through movements of the eye is much more efficient than depth sampling by walking, and thus it provides much more cognitive efficiency. A 3D-visualization provides much more depth-information and thus increases cognitive efficiency in depth sampling (there is less need to "walk around" the object to acquire information).

2. In Chapter 6, Ware presents some implications of pattern recognition and visual working memory on design. Provide an example that harnesses some of these principles (perhaps an advertisement, visualization, or interface) and discuss how the design takes these principles into account. Please include a screenshot, photo, or website URL.
See figure 1. The figure makes it possible to explain how pattern recognition works. Our visual working memory has a capacity of 1-3 objects, depending on complexity. The objects that are most relevant for pattern recognition in this figure are the blood trail, the suitcase with person and the "environment" which is clearly an airport, based on the check-in desks. The number one question that enters one person's mind is what causes the blood trail. When seeing the WWF logo and the message it becomes clear what the scene is about. The figure thus provides a familiar setting, with objects that are easily recognized by the brain. By introducing the blood, which is unfamiliar for the user in this setting, they make a statement and send the reader a message.

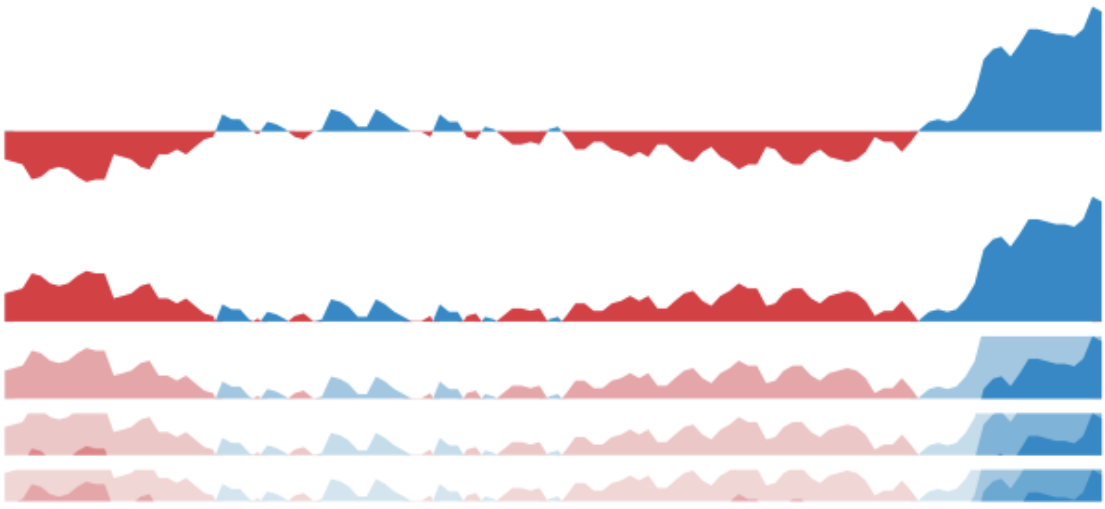
Figure 1: WWF advertisement. (From http://adsoftheworld.com/media/print/wwf_blood)

3. According to Bostock et. al., what are the primary advantages of D3? Based on your reading of the article, please provide an example of a type of visualization that would be easier and better implemented in D3 as opposed to HTML5, JSON, and Javascript. Please list the pros and cons of choosing D3 over pure HTML5, JSON and Javascript.

First of all, it allows for data visualization in the browser. It can manipulate every part of a web page's DOM structure and thus works perfectly well together with CSS, SVG and HTML. D3 provides much faster performance, especially with explicit transformations. This is one of the reasons that a visualization with D3 will load faster after page load than in any other framework. This difference will be more visible when outputting more powerful, interactive visualizations with big datasets.

4. Of the visualization figures presented in Heer et. al., which do you find the most difficult to comprehend? Does the complexity of the figure interfere with the goal of visualization as described in the article? Include a screenshot of the figure you have chosen in your response and use principles that you have learned so far (i.e., from design, perception, and cognition) to justify your choice.

I found the horizon graph visualization the most difficult to comprehend. Although this type of visualization makes it possible to use only a quarter of the space while keeping all data, it makes it much harder to read and interpret the data. The "stacking" of figure parts on top of each other to get the total data is very anti-intuitive and makes it very difficult to give insight in the data.



5. Play around with the interactive graphs included in the Heer article. You need to open this page in a browser that runs Java. Focus on Figure 1A. To what extent do interactivity and transitions, elements that D3 optimizes, add to the clarity and message of the visualization? With the element of interactivity in mind, redesign and sketch the contents of figure 1A with one of the other visualization types described in the Heer article. Include a picture of a sketch of your idea, and describe how it supports comprehension and data exploration.

The interactivity and transitions that are visible in the interactive graph of 1A make it possible to display a much larger dataset. It is therefor possible to compare different months with each other and makes it possible to see multiple data sets in one graph.