**Information Visualization**

**Mid Term**

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**1.Visual cluttering is an important topic in information visualization. Please answer the following questions:**

**1.1 What is visual cluttering? Why does it happen?**

**Ans:** Visual Clutter is when information is superimposed on more information and hence both information is not properly visible due to confusion. Visual Clutter usually happens because there is too much information to display in the same area or about the same area. For example, in geo visualization and maps, in any given area, there are rivers, plains and forests. To display all the information according to the vegetation and demographics with perfect accuracy leads to the area being overcrowded with information. This is visual clutter.

**1.2 What are the effects of visual cluttering to information visualization?**

**Ans:** Visual clutter generally leads to poor visualization results. This means, because of the clutter, the user or viewer is unable to see all the information in the visualization, thus completely destroying the actual purpose of visualizing the information. It cause more confusion and ambiguity, thus leading to misunderstanding of the information.

**1.3 Please provide an example of visual cluttering in information visualization. Please also show the way it can be conquered or controlled. This can be found by studying online or finding related papers. Provide a web link and write your description in the returned hardcopy answer.**

**Ans:** One major example is maps. There are many ways to reduce cluttering. One frequently used method is to limit the amount of information the user can see at first sight. This means that from up above or in a zoomed out perspective, the user sees very less, but as he keeps moving deeper and deeper, he starts seeing more. Another way, as discussed in this [paper](http://davis.wpi.edu/xmdv/docs/infovis04_clutter.pdf), it can also be done using dimensional re-ordering.

**1.4 What are your opinions and ideas the example in 1.3 can be further handled?**

**Ans:** I agree with the general methods used for that particular problem (maps). That is in fact the best and most efficient way to reduce clutter.

**2.Interaction is an indispensable part for a visual analytics system of big data. Please answer the following questions:**

**2.1 Why do we need interaction in visualizing information on computers?**

**Ans:** Interaction is like the question says an indispensable part of visual analytics. It is highly necessary because of two reasons:

(a) The human cognition system works better if it is using the brain not only to read, but to also interact and read.

(b) Humans are trained to learn better when interacting by default.

Hence, interactive systems always, always help us learn better, because we’re using a more attentive cognitive system and that helps us grasp concepts quickly.

**2.2 What are the tasks of these interactions:**

**Filtering/Highlighting**

**Pan & zoom**

**Focus + context**

**Labeling**

**Ans: (i)** Filtering and Highlighting helps grab the attention of the viewer to something important or worth noticing. Without this, important facts and figure would blend into normal text and would go unnoticed.

**(ii)** Pan and Zoom helps the user in understand the visualization is greater detail. For example, a map. What use would a map be if the user can’t zoom in to see the places more clearly?

**(iii)** Focus helps us tell the user or show the user the important parts of a visualization and context helps us tell them why the focused part is important.

**(iv)** Labeling is used to tell the user the names/details about parts of the visualization. Without labelling, the user would be clueless about as to what he’s looking at.

**2.3 Describe one good example system of using various interactions to address the challenge of visualizing large-scale datasets. Provide a web link and write your description in the returned hardcopy answer**

**Ans:** Take a look at this link: <https://cybermap.kaspersky.com/>. This website, built by Kaspersky tells us how many cyberattacks are happening on any country at any given moment. It is constantly updated and presents data in real time. It lets us filter by the kind of attacks (DoS, SAS, OAS etc), places attacked and also tells us which country is attacked the most.

**2.4 Please describe how the interaction example in 2.3 can be further improved in your opinion.**

**Ans:** The only feature missing that I could notice was that the visualization does not let us choose the attacks originating from a particular state or country. Of course, it shows all of them, but if I wanted to see all attacks going out of the US **only**, I would not be able to do that.