Universität Stuttgart

Institut für Visualisierung und Interaktive Systeme

Assignment 3

Information Visualization & Visual Analytics (WS 2019/20)

Due: Monday, 11.11.2019, 11:59 AM **Presentation:** Wednesday, 13.11.2019

Please solve the assignment in **groups of up to three (3) students**. Choose one student who submits your solution in ILIAS as PDF (for theoretical submissions) or ZIP (for practical submissions Impl) as group submission. Make sure that you create your team before uploading the solution. **Important:** The submitted files must follow the naming scheme `yourlastname1_yourlastname2_yourlastname3` with respective file extension, of course.

Task 1 Lie Factor *[Points: 6]*

Task 1.1 (3 points) Compute for the following visualization the lie factor for both the first and second data item (doors) in relation to the third item, as defined in the lecture. Provide every step of your calculation. Hints: All doors have the same aspect ratio. The lines and numbers in red depict the respective lengths in pixels for your convenience and are not part of the actual diagram.

Production of tropical hardwood parquet in 2008 (1000m²)

Task 1.2 (3 points) The following image shows a side-by-side comparison of two similar versions of the previous diagram. Compare the two visualizations regarding their average lie factor. Do you think the factor is the same for both variants, or is one (which?) higher? Explain your reasoning.

Production of tropical hardwood parquet in 2008 (1000m²)

Production of tropical hardwood parquet in 2008 (1000m²)

Task 2 Gestalt Principles *[Points: 8]*

Below, four examples of company logos are given. For each, quickly describe which of the gestalt principles are responsible for the predominant effect in the respective case and why/where/how.

As an example: In the logo of "Federal Express": FedEx, the effect of the viewer perceiving an arrow between "E" and "x" could be explained by the law of closure (tendency to perceive the arrow as a closed contour) leading to a bi-stable articulation of figure and ground.

(a) The logo of Coca Cola

(b) The logo of International Business Machines

(c) The logo of Sun Microsystems

(d) The logo of Unilever

Task 3 Pre-Attentive Processing *[Points: 10]*

In the lecture you heard about pre-attentive processing that describes the fact that we are able to process certain visual properties subconsciously and instantly. Have a look at the following scenarios and imagine that you want to implement a system using visualization that supports solving the task. State and explain for each scenario whether you could exploit pre-attentive processing to improve the performance of the task at hand and if this is the case, how you would achieve this *exactly*. You can also provide sketches to make your point.

1. A text document is shown on screen and you want to search for a word.
2. The windows of your smart home report whether they are open or closed. On leaving the premises you want to check whether all windows are closed.
3. You have a static (heat-)map of Germany that visualizes the average income per region. You want to write a report about the economical well-being of the population in each state.
4. You monitor a dynamic dashboard displaying the current temperature of each machine in your factory and you have to quickly intervene if a machine gets too hot.
5. You get the results of a blood test from one of your patients and you have to check whether the patient needs further medical assistance.