

## **Master thesis**

### **Topic: Cognitive Biases in Visual Analytics: discovering and reducing**

Now days a huge volume of information can better and faster understanding only using visualizations. But cognitive biases and misleading data visualizations become a significant issue due to misunderstanding data visualizations and their negative impact on informed decision-making.

Consequently, it is important to understand the factors that make viewers vulnerable to misleading data visualizations and to explore:

- how cognitive biases may impact viewers' understanding of relationships between data, possibly leading to error or systematic biases in analysts' interpretation of the data visualizations
- effective debiasing that can help reducing the negative effects of such visualizations.

**The goal** of this master thesis is discovering cognitive biases in a visual analytics environment and analyzing their impact on decision making process.

**The focus** is on:

1. Critical analyzing and interpret data visualizations – which information people attend to in visualizations, which knowledge someone seeks to gain from a visualization, how people use visualizations.
2. Discovering cognitive biases in a visual analytics environment - using psychological empirical techniques to better understand the cognitive implications on decision making process and how people use visualizations to reduce the cognitive load.
3. Perspectives on human bias in visual analytics and debiasing - make new guidelines for precise and effective data communication that consider a myriad of factors when working with visualizations.

This work makes a practical contribution to build and refine theories of how people work with visual information and suggest new guidelines for effective debiasing that can help reducing the negative effects of misunderstanding visualizations.

It suggests a new approach and methodology of reducing cognitive load and mental cost due debiasing and increased quality and cognitive resource efficiency in task execution.

### **Relevant topics:**

- Influence cognitive biases on interpretation of Data visualizations
- Critical analysis of existing methods for discovering cognitive biases in a visual analytics environment
- Cognitive biases in visualizations and decision making
- Perspectives on human bias in Visual Analytics

## **Introduction:**

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