

Workshop

Concepts of Data Visualization & Introduction to Tableau

Organisational details

Instructor:	Dr Tobias Keller
Dates:	January 30 & 31, 2023, 9 am – 5 pm, and February 6 & 7, 2023, 9 am – 5 pm.
Venue:	Room 315, Main building JLU, Ludwigstr. 23, 35390 Giessen
ECTS:	4
Max. participants:	12

Objectives

“One picture is worth ten thousand words” – this proverb is especially true in the case of data analysis. In research and business contexts, complex quantitative relationships are often ineffectively communicated because analysts underestimate the value of good data visualizations.

This course aims at enabling participants to effectively visualize and communicate their analytical results. Examples from practical analytical use cases and scientific insights about visual perception and design lay solid foundations of data visualization. Participants strengthen and apply their understanding of these data visualization concepts while learning hands-on how to use a professional data visualization software (Tableau).

Content and methods

The course consists of lectures to build the theoretical background as well as hands-on tutorials and exercises using Tableau. Participants will learn by examples and exercises from the instructor’s experience in research and practice.

Hands-on tutorials and exercises will make up about 60 per cent of the course time. Participants will complete those using their own computers. Please see the preparation requirements below for a list of software that needs to be installed to that end. The exercises will be based on exemplary datasets that will be provided to the participants before the course.

Structure:

1. Introduction: Data Science & Importance of Data Visualization (approximately 2-3 hours)
 - 1.1. Greeting
 - 1.2. Learning Objectives
 - 1.3. Course Logistics
 - 1.4. Readings
 - 1.5. Data Science and the Importance of Data Visualization

- 1.6. Teaser: Tableau in 5 Minutes
- 1.7. Examples from Practice
2. Foundations of Data Visualization and Introduction to Tableau (approximately 1.5 to 2 days)
 - 2.1. Information Visualization
 - 2.2. Requirements for Data Visualization
 - 2.3. Introduction to Tableau
 - 2.4. Visual Perception
 - 2.5. Some bad Examples of (Data) Visualization
 - 2.6. Effectively using Visual Attributes
 - 2.7. Some best practices
3. Visualization of Analytical Relationships & Patterns with Tableau (approximately 1.5 to 2 days)
 - 3.1. Overview of Analytical Relationships & Patterns
 - 3.2. Part-to-whole Comparisons and Rankings
 - 3.3. Geographic Mapping
 - 3.4. The Data-Ink-Ratio / Worksheet Formatting
 - 3.5. Correlations
 - 3.6. Time-series
 - 3.7. Dashboards, Analytical Interaction and Navigation
 - 3.8. Additional Topics

The approximated time we will spend on the individual chapters is indicated above. We may deviate from this schedule depending on the pace and on questions asked during the course.

Requirements to register for the course

Basic knowledge in statistics is required. This includes concepts such as levels of measurement (e.g. nominal, ordinal, etc.) and the appropriate calculations and aggregations (e.g. mean, median, mode, etc.). Knowledge about correlations and regression analysis are helpful but not required.

To gain the ECTS credit points participants have to:

- refresh their knowledge of the aforementioned statistical concepts,
- download and install the current version of the software Tableau (version \geq 2022.4), here: <https://www.tableau.com/de-de/support/releases>,
- obtain an academic license (either as PhD student or as academic researcher), here: <https://www.tableau.com/de-de/community/academic>,
- download and extract the course material and exemplary datasets that will be provided in time before the course,
- actively participate during the workshop.

Target group

Doctoral candidates or postdoctoral researchers doing empirical research or intending to work as data scientists or in business consulting.

Course language

English (German, if only German participants)

Please note: As this is an English language course proficiency in English at the C1 level of competency is required.

About the Instructor

Dr Tobias Keller has been working as data scientist at ZERO.ONE.DATA, the big data startup of Deutsche Bahn AG since 2016. He consults on and applies machine learning and statistics for artificial intelligence systems in a big data environment. Furthermore, he teaches data science at Deutsche Bahn, in the doctoral education programmes at Justus Liebig University Giessen, and in the doctoral programme and master programme at WHU – Otto Beisheim School of Management. His research interests include machine learning and artificial intelligence, finance and accounting, strategic management.

Registration

By January 20, 2023 via e-mail at info@ggs.uni-giessen.de.