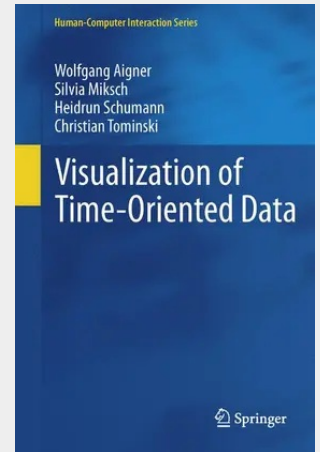


Visualization of Time-Oriented Data

Time is an exceptional dimension that is common to many application domains such as medicine, engineering, business, or science. Due to the distinct characteristics of time, appropriate visual and analytical methods are required to explore and analyze them. This book starts with an introduction to visualization and historical examples of visual representations. At its core, the book presents and discusses a systematic view of the visualization of time-oriented data along three key questions: what is being visualized (data), why something is visualized (user tasks), and how it is presented (visual representation). To support visual exploration, interaction techniques and analytical methods are required that are discussed in separate chapters. A large part of this book is devoted to a structured survey of 101 different visualization techniques as a reference for scientists conducting related research as well as for practitioners seeking information on how their time-oriented data can best be visualized.

Time is an exceptional data dimension due to its importance and unique influence. This implies that special methods are needed for dealing with time in data sets in order to take advantage of these specifics. Visual methods are a key part of this tool set allowing for presentation, analysis, and exploration of temporal data sets. Visualisation of Time-Oriented Data provides an overview of the field of visualisation techniques for time-oriented data, but even more importantly analyses the specifics and similarities of the investigated techniques in order to identify clusters for structuring and making the field manageable. It also analyses the techniques uniformly along different sets of attributes making it easy to grasp their main characteristics and support researchers as well as developers in selecting appropriate techniques for their demands. The theoretic foundations of visualization itself are also discussed, the data dimension time, tasks related to time-oriented data, possible mappings of time, various examples of early (pre-computer age) representation techniques, and a conceptual framework for visually analyzing time-oriented data.



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