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Interactive Visual Analysis of Process Data



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Abstract:

Data gathered from processes, or process data, contains many different aspects that a visualization system should also convey. Aspects such as, temporal coherence, spatial connectivity, streaming data, and the need for in-situ visualizations, which all come with their independent challenges. Additionally, as sensors get more affordable, and the benefits of measurements get clearer we are faced with a deluge of data, of which sizes are rapidly growing. With all the aspects that should be supported and the vast increase in the amount of data, the traditional techniques of dashboards showing the recent data becomes insufficient for practical use. In this thesis we investigate how to extend the traditional process visualization techniques by bringing the streaming process data into an interactive visual analysis setting. The augmentation of process visualization with interactivity enables the users to go beyond the mere observation, pose questions about observed phenomena and delve into the data to mine for the answers. Furthermore, this thesis investigates how to utilize frequency based, as opposed to item based, techniques to show such large amounts of data. By utilizing kernel density estimates (KDE) we show how the display of streaming data benefit by the non-parametric automatic aggregation to interpret incoming data put in context to historic data.

