User Interaction on Various Levels of Data Displays

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Abstract: The development of interactive statistical graphics in the 1980's switched graphics from a result presenting device to an analytic tool. But, there is a huge confusion and disagreement about the definitions and meaning of interactivity, even within the statistical graphics community. Swayne & Klinke (1999) reported the results of a questionnaire that had been launched within the community about the use of interactive statistical graphics and they have expressed surprise about the different understandings of this term. In this talk the basic principles of user interaction and the linked paradigm will be discussed.

By separating data displays into four levels - frame, type, model, and sample population - it is possible to describe the different plot-data relationships. According to the graph levels that are affected by an interaction a classification of user interactions is given. The main focus will be on internal and external linking structures that are used to propagate user interaction requests. Internal linking is necessary to pass messages from the visible display level to the invisible levels. Different linking schemes arise depending on the kinds of relationships between the graph levels. The external linking structure controls the exchange of information between two or more displays. The display levels can be used to classify and describe the possible scenarios.