Data Processing - Readings 6

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1 Introduction

Heer and Shneiderman (2012) present a taxonomy of interactive dynamics for creating successful visual analysis tools. The taxonomy consists of three high-level categories - data and view specification, view manipulation, and analysis process and provenance - and each high-level category consists of four task types. I will briefly elaborate on three concepts covered in Lecture 9 - Interaction and relate them to the taxonomy. The three concepts are as follows: filtering, overview and detail, and brushing and linking.

2 Filtering

Analysts often want to filter on the data they are interested in, and that is where filtering comes in. Filtering allows analysts to drill down into the data and shift their focus among different data subsets.

In the taxonomy presented by Heer and Shneiderman (2012), filtering (filter) is a task type that is part of the data and view specification category. This category includes task types that allow analysts to specify the data and views of interest.

Although filtering (filter) is part of the data and view specification category, it is also related to the view manipulation category, and the selection (select) task type in particular (which is a task type that is part of the view manipulation category). The view manipulation category includes task types that allow analysts to manipulate the data and views of interest. Analysts can manipulate data of interest by selecting them, and this can be achieved by filtering the data.

3 Overview and Detail

When analysts look at a data set, they often want an overview first, and then get details (for example, to answer specific questions about the data). Thus, as

stated by Heer and Shneiderman (2012, p. 10), '*one common pattern of navigation adheres to the widely cited visual information-seeking mantra:* "Overview first, zoom and filter, then details-on-demand."'

The concept of overview and detail is related to the navigation (navigate) task type, which is a task type that is part of the view manipulation category (see the previous section). In order to assist analysts in navigating the views and data of interest, visual analysis tools often contain dynamic query widgets and pan and zoom controls.

4 Brushing and Linking

Analysts often want to view their data from different perspectives (i.e., when working with multivariate data). Therefore, visual analysis tools often support coordinated multiple views. Visual analysis tools that support coordinated multiple views, often also support brushing and linking. If a visual analysis tool supports brushing and linking, an analyst can select data points in one view by brushing them, and then the same data points will be highlighted in all of the other views. This allows analysts to interactively explore the data across views.

The concept of brushing and linking is related to the coordination (coordinate) task type, which is a task type that is part of the view manipulation category. Coordinated views allow for linked, multi-dimensional exploration.

5 Conclusion

I have briefly elaborated on the concepts of filtering, overview and detail, and brushing and linking, and I have related these concepts to the taxonomy of interactive dynamics presented by Heer and Shneiderman (2012). The concept of filtering is related to the data and view specification (high-level) category and the view manipulation (high-level) category, and the concepts of overview and detail, and brushing and linking are related to the view manipulation (high-level) category.

References

Heer, J. and Shneiderman, B. (2012). Interactive dynamics for visual analysis. *Queue*, 10(2):30:30–30:55.