

# Development of a Tool for Visual Comparison of multi-faceted Data by Juxtaposed Map Views

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A well-developed visual analytic tool is required to obtain targeted information through visualization and comparison of multi-faceted data. This thesis focuses on developing a tool for visual comparison of multi-faceted data through juxtaposed map views. Two developed prototypes have been developed and different interaction methods are incorporated. Finally, the data comparison capability of developed prototypes is evaluated through a survey.

## OBJECTIVES

- To identify and select interactions that support and enhance the visual comparison of multi-faceted data by using juxtaposed map views.
- To develop a tool that implements interactions with juxtaposed map views to support and facilitate the comparison of geolocated social media data.

## METHODOLOGY

Flickr data from 2007 to 2018 for the city of Dresden were processed and compared using the developed prototype. The data files used are the property of the Institute of Cartography (TUD).

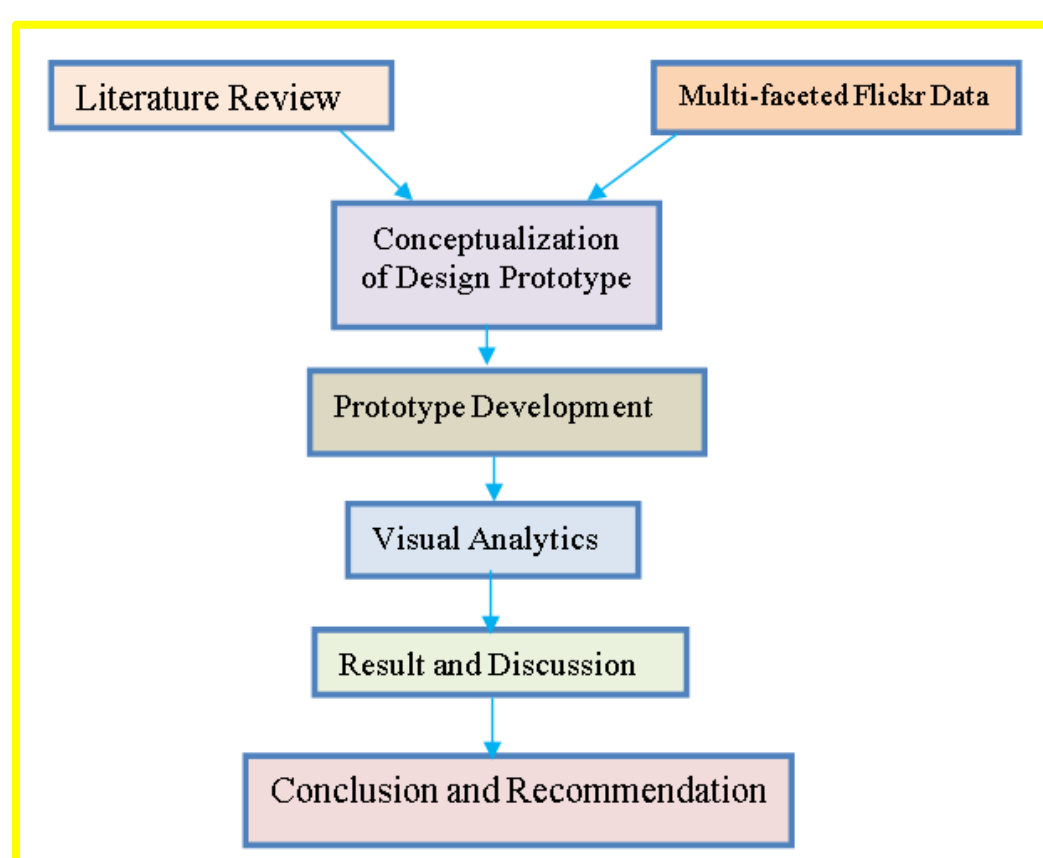


Figure 1: The workflow overview of the thesis.

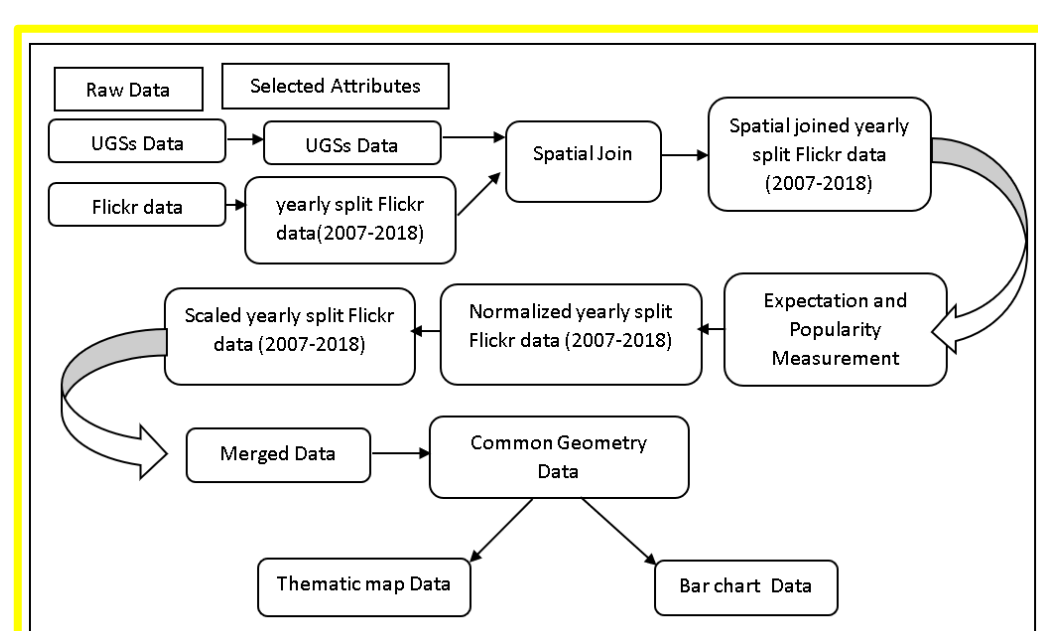


Figure 2: The sequential data processing steps followed in this study.

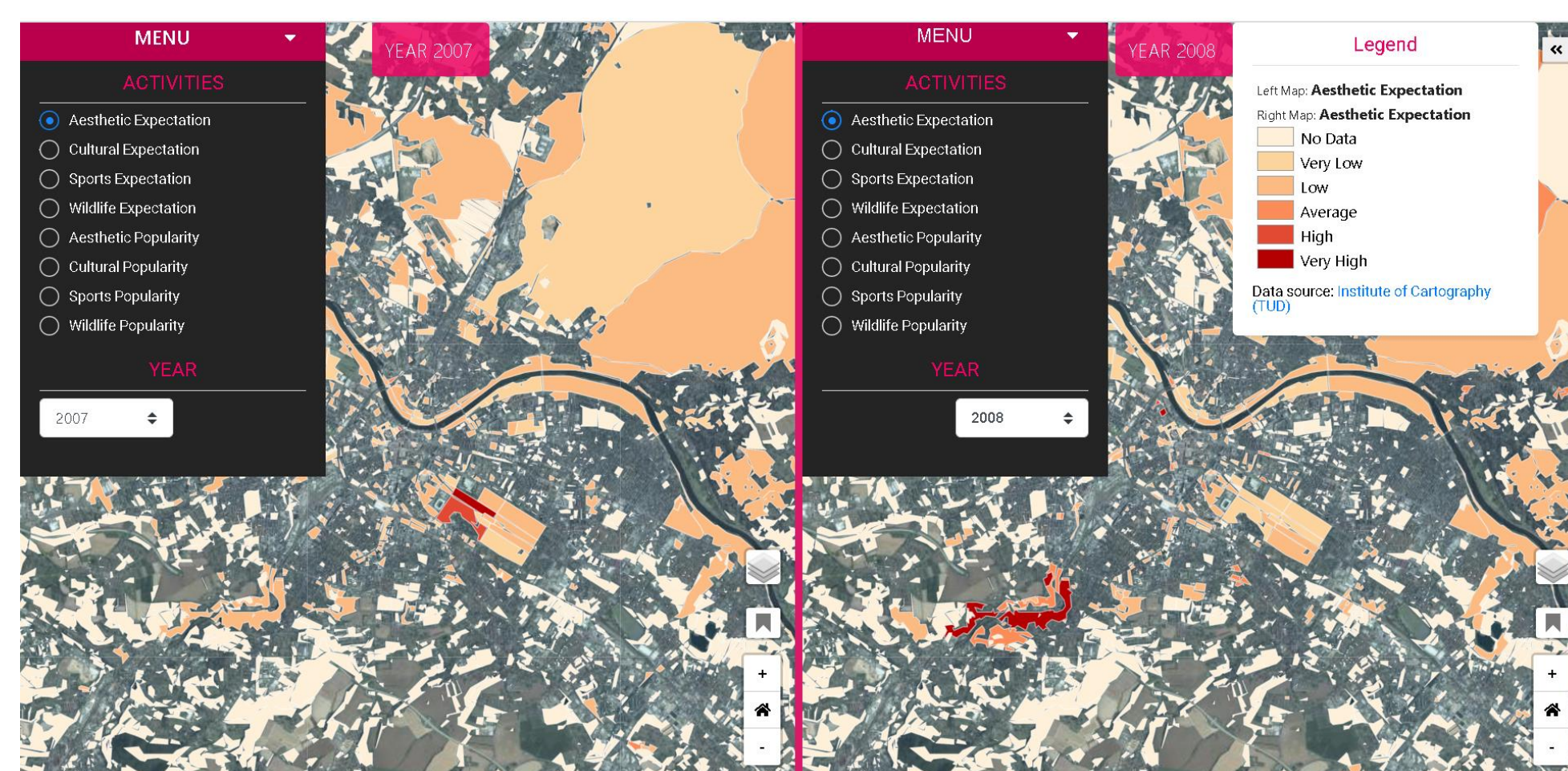


Figure 3: A designed preview of unlinked map views

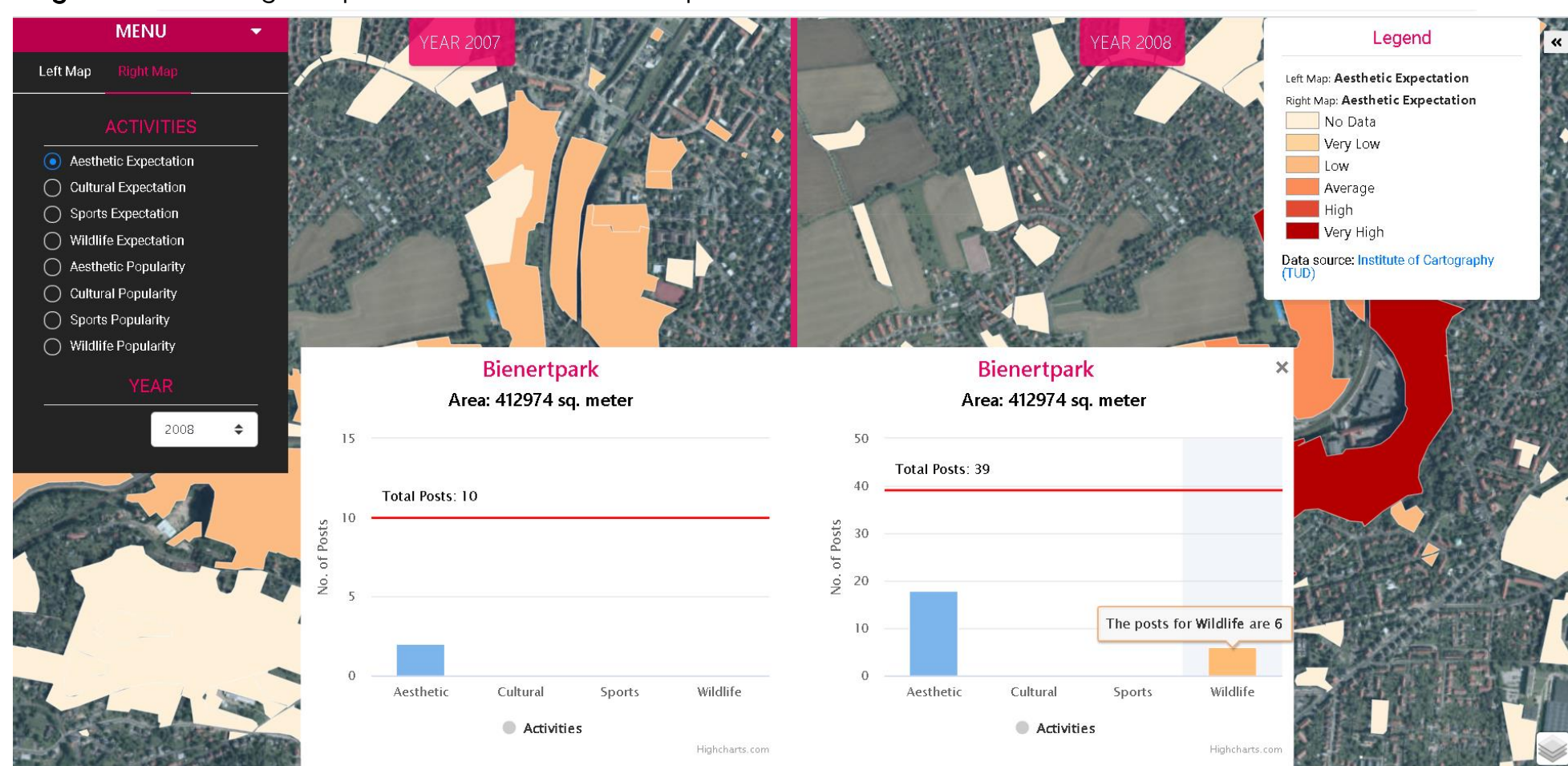


Figure 4: A designed preview of linked map views with linked bar charts

## INTERACTION METHODS

Three taxonomies with several tasks were designed to incorporate the interaction methods.

- Background Map (Locating)**
  - zooming, panning, scrolling, re-centring
- Foreground Visualization(Comparison)**
  - clicking, scrolling, panning, zooming,
  - collapsing and expanding, mouse hover, brushing as conditioning
- Temporal Component of the Data (Associating)**
  - brushing as conditioning
  - mouse hover, clicking, linking the views

## PROTOTYPE SUMMARY

There are separate selection menus in unlinked map views. On the other hand, the linked map views contain one menu on the left map. The background map, foreground data and bar charts are linked in the linked map views.

## OVERALL USER EXPERIENCE

A survey was conducted based on 12 tasks related to the spatial, temporal and thematic facets of the data set. The tasks were designed to relate with the case study titled "Monitoring the urban green spaces (UGSs) utilization pattern changes among the visitors." The total number of clicks shows how the developed prototypes' overall comparative capability to solve a task. Although, for each task, the linked map views showed faster performance than the unlinked map views.

## CONCLUSION

The developed prototypes can compare the three facets of the dataset used. Linked map views could compare data faster than unlinked map views. In addition, identified interaction methods played a significant role for both views. Therefore, the developed prototypes are presented as a powerful and functional means for comparing Flickr data in the scientific domain. The developed prototypes can be usefully applied by urban landscape planners and in other cities.

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## KEYWORDS

Information visualization, juxtaposition, visual analytics

## LINK TO PROTOTYPE

<https://geomonir.github.io/LinkedMapView/>

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