

# Improving Accessibility and Usability of Geo-referenced Statistical Data

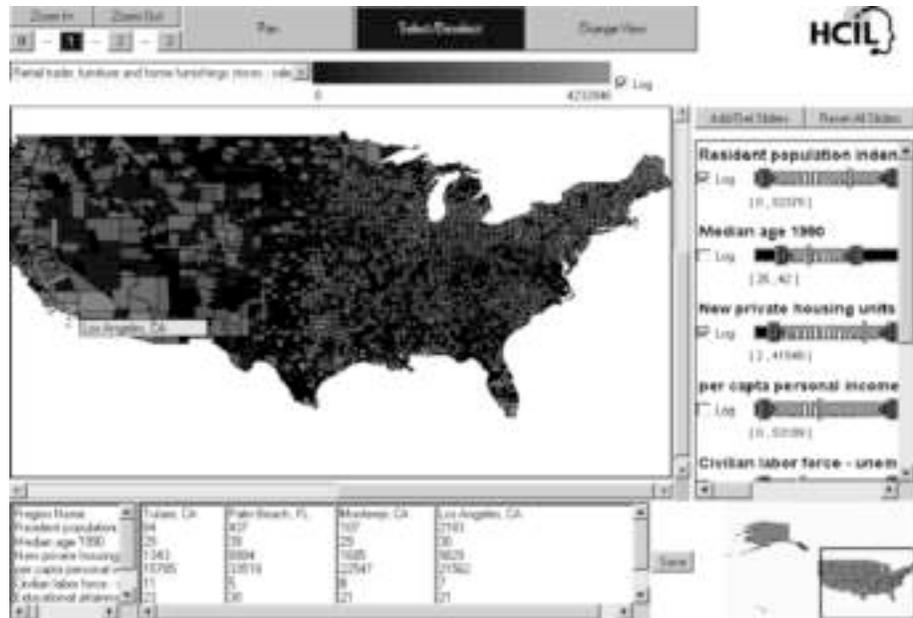
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## Abstract

We demonstrate three versions of YMap, a dynamic choropleth map tool for geo-referenced statistical data explorations. More details can be found in (Zhao et al. 2003)

First we present the Visual Basic desktop version. Users can quickly visualize the distribution of a data attribute on the choropleth map by shading the map using that attribute, brush the tightly coupled scatterplot, map, and detail window, formulate conjunctive queries and view the query results immediately on the map and scatterplot by adjusting the double-thumb sliders, or zoom and pan to observe data patterns in smaller or denser regions. (Screenshots can be found in (Zhao et al. 2003)).

Second we present the Java applet version for Web access. Web YMap uses special color-coded raster images to ship geographic shapes to the browser, which allows varieties of sub-second fine-grained interface controls as those in the desktop version, and has the features of short initial download time, near-constant performance scalability for larger numbers of geographic objects, and download-map-segment-only-when-necessary, which potentially reduces the overall data transfer over the network. As a result, Web YMap accommodates users with slow network connections and low-end machines. It also incorporates some new features such as the histogram bars coupled with the map within the sliders, and different slider and shader scales to allow more uniform filtering effect.



Third we present auditory YMap that aims at supporting blind and vision-impaired users. It presents information using synthesized spatial sound instead of via visual perceptions. Sounds of different timbres, pitches, and spatial positions are tied to the map regions, the sliders, the histograms, and the sweeping lines. The spatial sounds create the effect of a virtual US state map hung in front of the user. Users can navigate the interface using only keyboard, and explore the data set though audio perceptions.

## References

Zhao, H. Plaisant C., and Shneiderman, B., Improving Accessibility and Usability of Geo-referenced Statistical Data, *Proc. of the National Conf. on Digital Government Research*, Boston, USA, 2003