Paper 3 Review Name: Chia Yuan Chuang

Visualization in Transportation: Challenges and Opportunities for Everyone

Michael L. Pack, University of Maryland, College Park

This paper presents a visualization tool for visualizing transportation system, especially in car incidents. It shows timeline chart, 4D real-time system, cluster explorer chart, interactive spiral graph, ArcChart, and virtual incident management game.

Figure 1. Temporal, spatial, and categorical data commingle on the incident timeline. With this tool, users are more likely to notice critical information and can more quickly comprehend all the events involved in an accident.

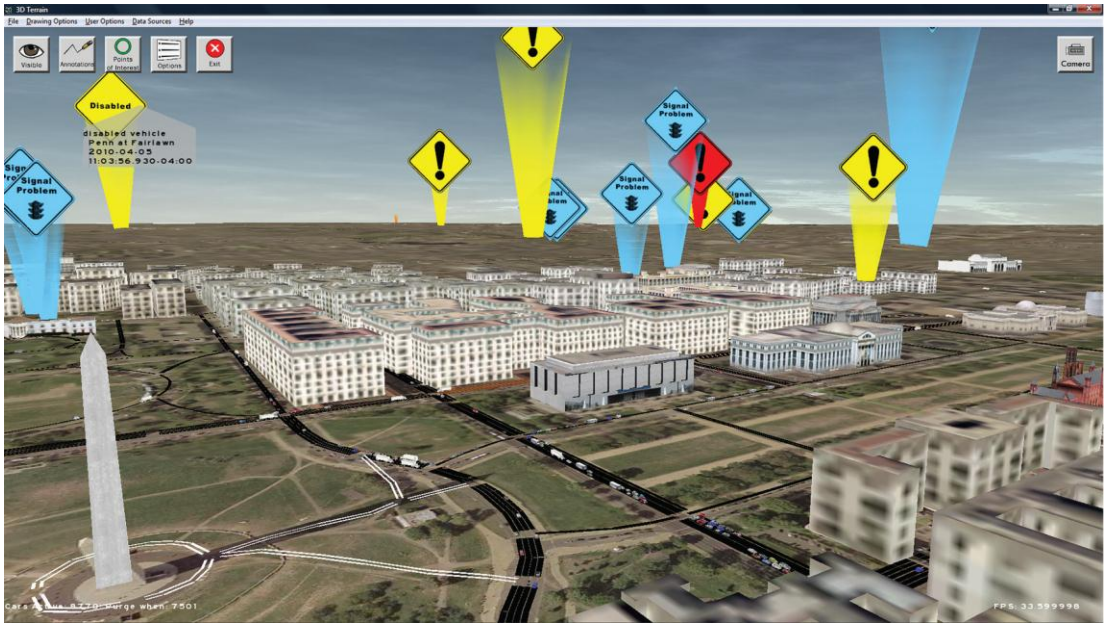


Figure 2. Screenshot of a 4D –realtime visualization system displaying traffic conditions on wide scale. The system interacts with traffic database to show animations of traffic, incident, and weather data.

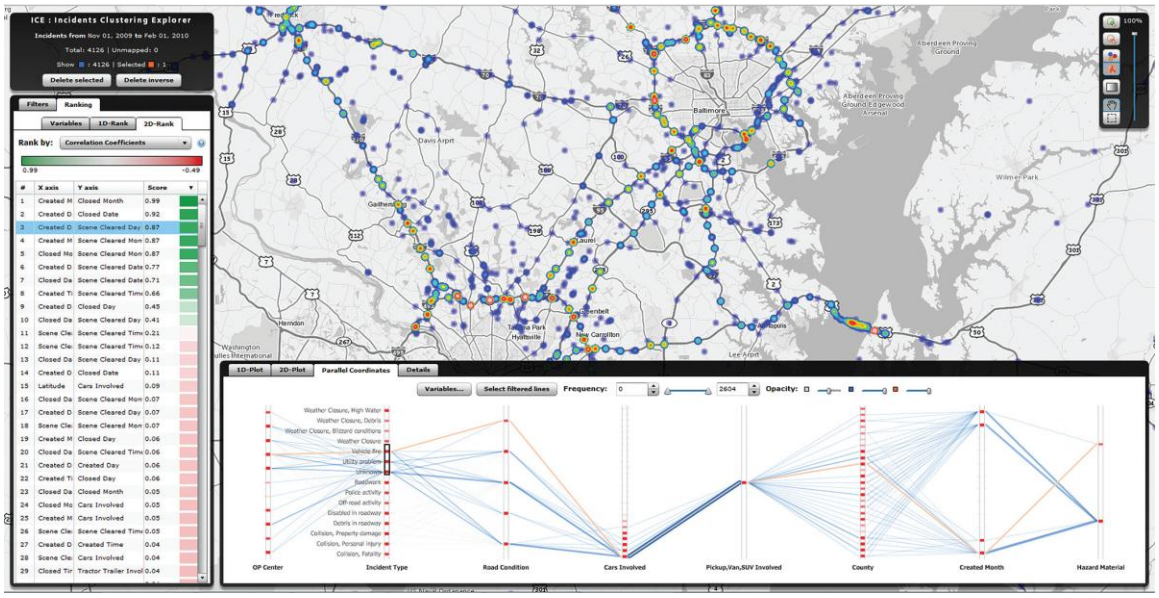
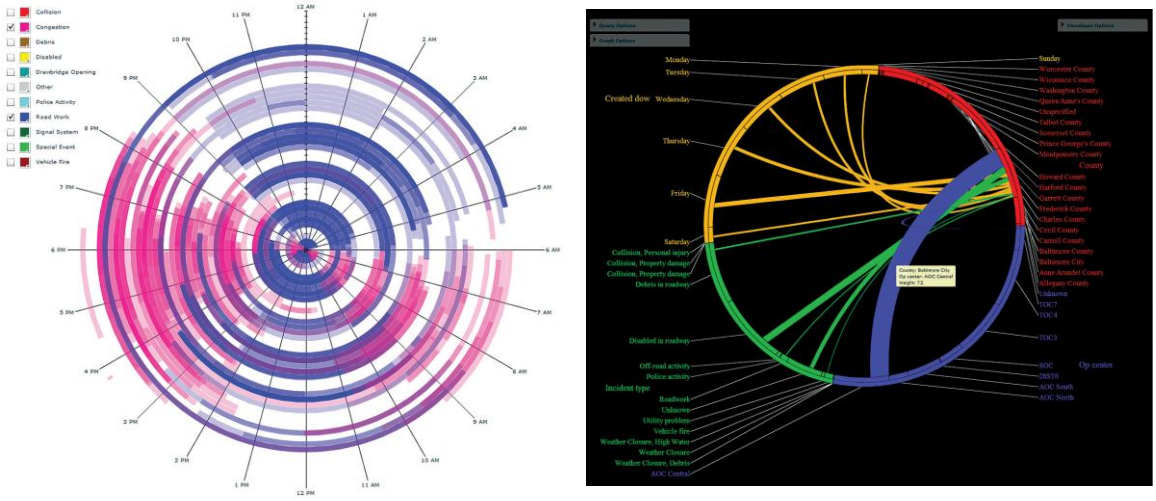


Figure 3. A screenshot of the Incident Cluster Explorer (ICE). ICE lets users analyze data related to Virginia, Washington, D.C., and Maryland accident reports.



(a) (b)

Figure 4. (a)The interactive spiral graph lets users explore temporal patterns in transportation events. The graph can contain days', weeks', or years' worth of construction, accident, or other transportation event data. (b) The ArcChart circular dependency graph. This graph can show links between categorical, temporal, and spatial variables.

The five research examples are created by CATT lab researchers. The demo of this paper could be found here: http://www.cattlab.umd.edu/demo/.

The author claims there are several challenges of data and information visualization in transportation: (1) the curse of high dimensionality; (2) handling categorical variables; (3) 3D visualizations (When are they appropriate or inappropriate, and how do we optimize them for speed and portability?); (4) visualization of massive data sets; (5) collaborative visualization; (6) misrepresentation of data and concepts; (7) trend visualization and analysis; (8) temporal visualization of changing geospatial data sets. The author also claims that more appropriate visual analytic tools should be designed for exploring the data, extracting meaningful knowledge and representing results by software engineers, especially for computer graphic community.

URL:

http://ieeexplore.ieee.org.ezproxy1.lib.asu.edu/stamp/stamp.jsp?tp=&arnumber=5492972

Citation:

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