

Nonlinear Visualization Techniques

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MITRE Sponsored Research

Problem

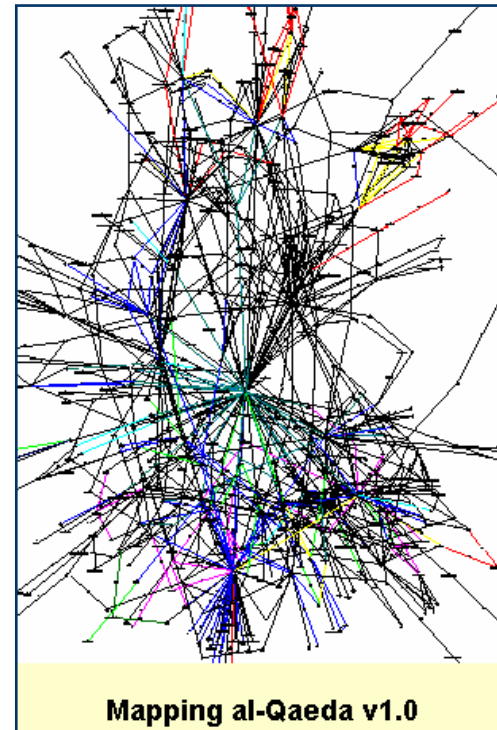
- **With traditional visualization techniques for massive datasets, the user must often choose between being either too zoomed in (such that the overall context of the data is lost) or too zoomed out (such that the details of the data are unavailable).**
- **This information management problem is seen in many domains, including intelligence analysis, imagery analysis, air defense, and combat support.**

Background

Example: Intelligence Domain

The increase in the availability of raw, multi-format data provides the user with more information, but makes it more difficult to uncover and interpret relationships and patterns hidden within the data.

The intelligence software pictured at right doesn't provide the ability to zoom in to the nodes while preserving the overall context.



Link Analysis Display

Objective

- **Assess nonlinear visualization techniques for graphical data, specifically “semantic lensing” techniques**
 - **FY04: Develop and experiment with nonlinear visualization techniques**
 - **FY05: Conduct field studies with the techniques across a variety of domains**

Activities

- **Developed linear and nonlinear magnification lenses and conducted an experiment to assess user interaction with the lenses**
- **Developed semantic zooming prototype of the MITRE organizational structure using Piccolo (UMD) and conducted an experiment to understand how semantic zooming can affect relationship recognition**
- **Integrating lenses into Analyst Notebook application**
- **Coordinating an Intel Analyst – Information Visualization TEM/SIG**

Highlight



Analysis improved by using a combination of lens types

Read our paper to learn more!

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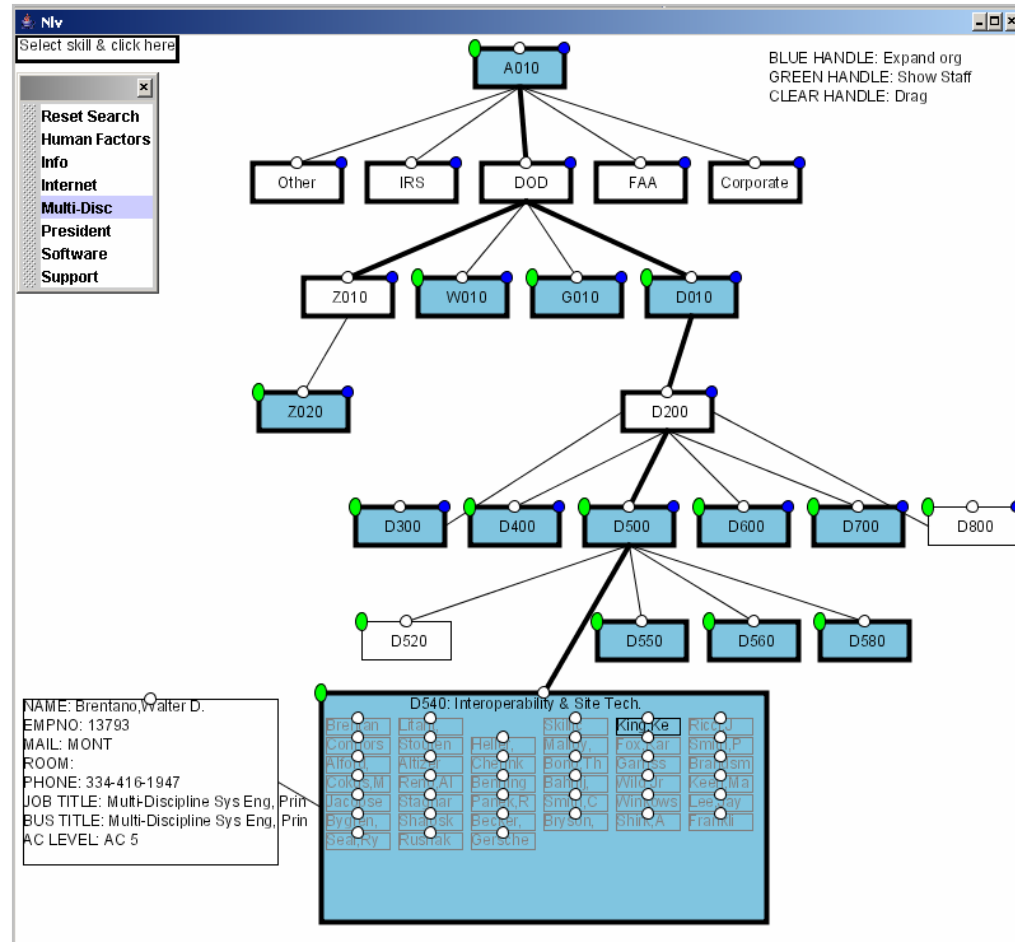
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Demonstration

Who else at MITRE has the same job title as you?

Where do these people work within MITRE?

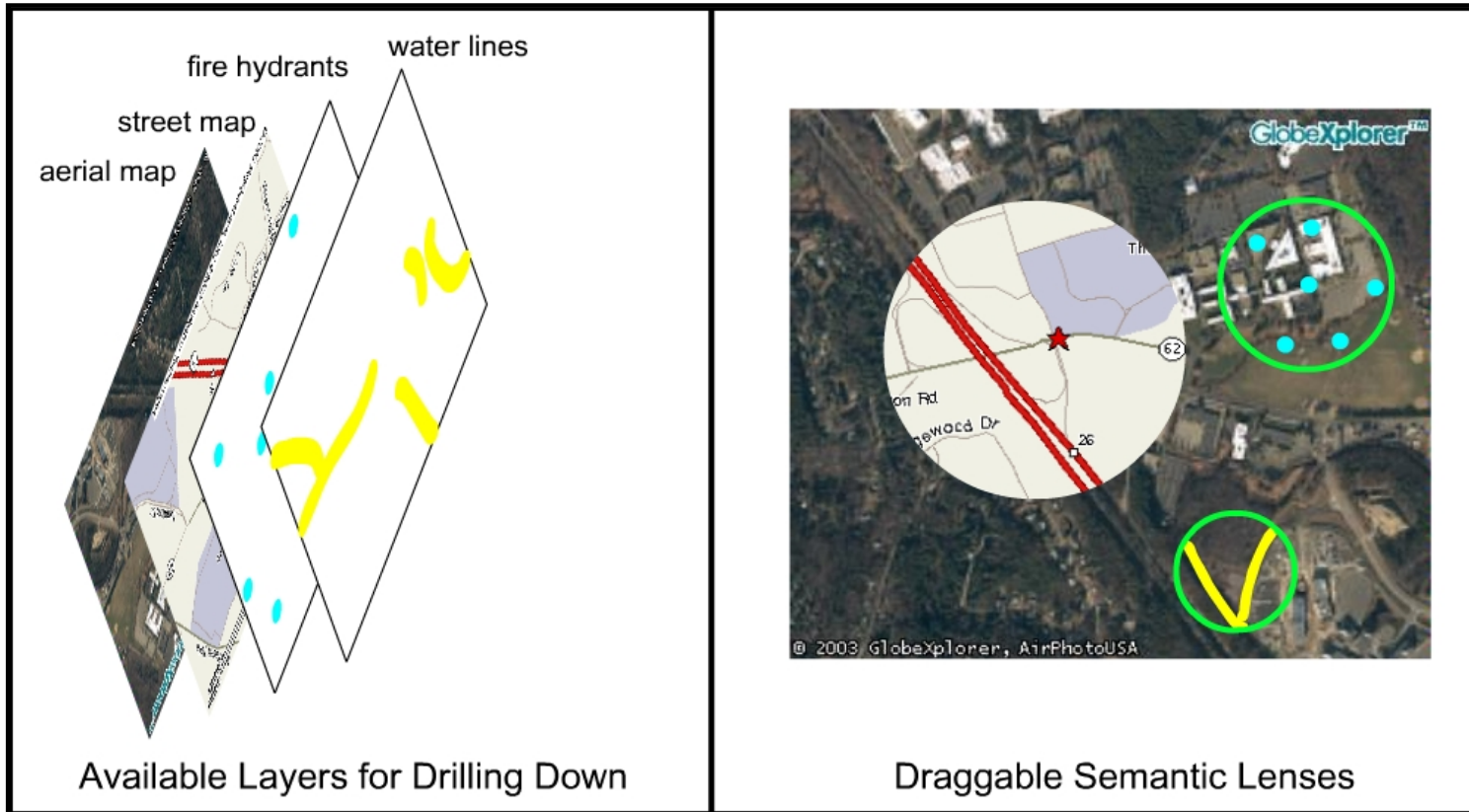
Find out using the NLVis prototype!



Impacts

- **Enabling MITRE's sponsors to make faster and better-informed decisions**
 - Reducing time required to change between foci (detail/overview)
 - Altering presentation of data so that patterns and relationships can more easily be recognized within the data
- **Developing new visualization techniques, conducting experiments, and disseminating results to the information visualization community**
 - Submitting papers to key conferences (e.g., CHI, AVI, CSCW, DIS, InfoVis, UPA, VDA, etc.)

Future Plans



Develop and experiment with semantic lenses

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