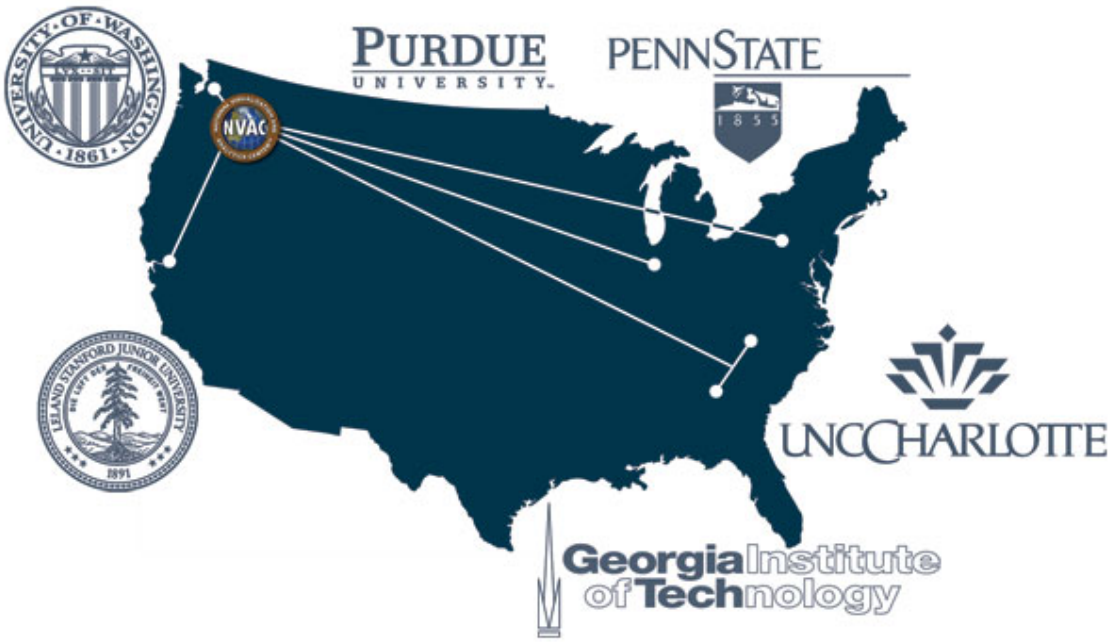
Introduction to the Regional Visualization and Analytics Centers (RVACs)



Jim Thomas

Director National Visualization and Analytics Center

Pacific Northwest National Laboratory

3/16/2007

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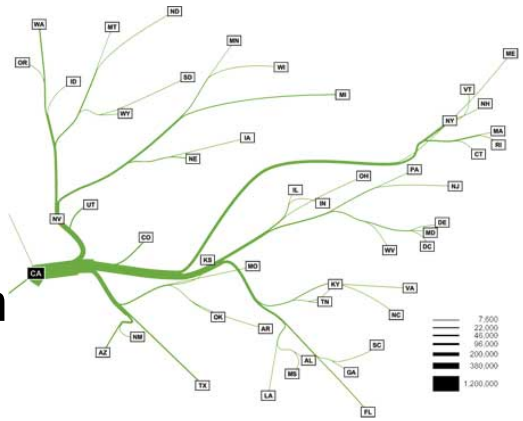
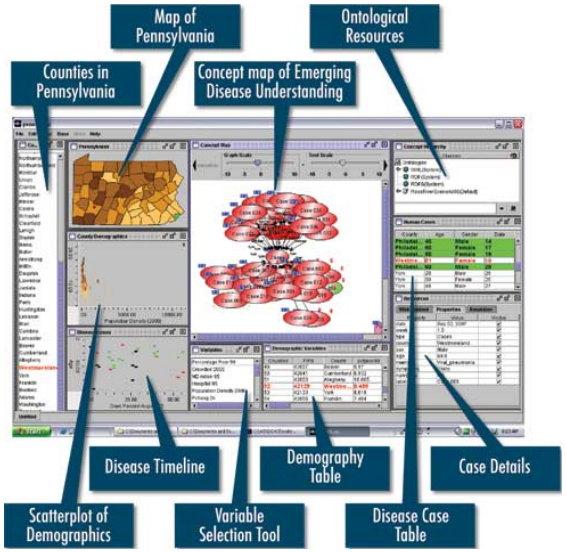
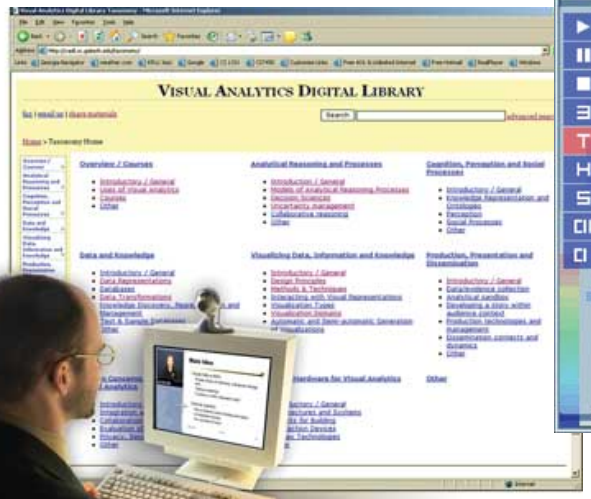
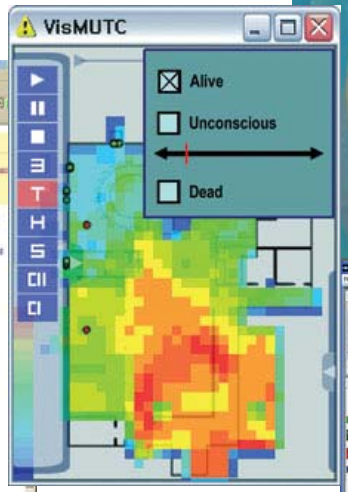
Today's Topics

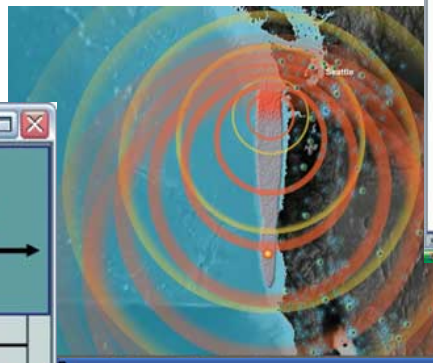
- Research Motivation
- National Visualization and Analytics Center (NVAC)
- Highlights of RVAC Research
- Collaborating with RVACs

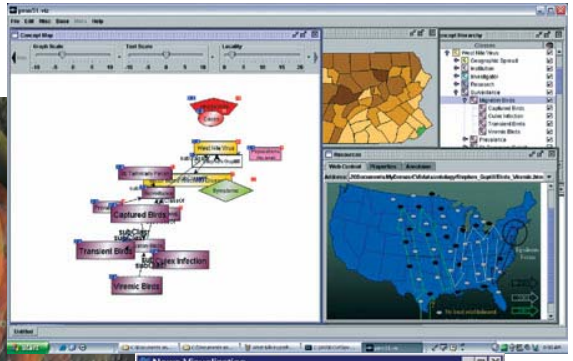












Research Motivation

- Time critical decisions with high consequence
  - Threat and risk analysis
  - Emergency preparedness and response
- Data complexities:
  - Abstract; often lack obvious physical representation
  - Massive, disparate, conflicting and dynamic
  - Diverse types: simulations, experiments, text, imagery, video, voice, web, sensor data
  - Multiple ontologies, languages, cultures, and contexts for analysis
  - Temporal and spatial information may be critical, but only implicit
  - Useful data buried in noise
  - Ambiguous, uncertain, and incomplete

Need:
Analytic capabilities that facilitate application of *human judgment* to evaluate complex data and enable action

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Visual Analytics

Visual analytics is the science of analytical reasoning facilitated by interactive visual interfaces.

People use visual analytics tools and techniques to

- Synthesize information and derive insight from massive, dynamic, ambiguous, and often conflicting data
- Detect the expected and discover the unexpected
- Provide timely, defensible, and understandable assessments
- Communicate assessment effectively for action.

"The beginning of knowledge is the discovery of something we do not understand."

~Frank Herbert
(1920 - 1986)

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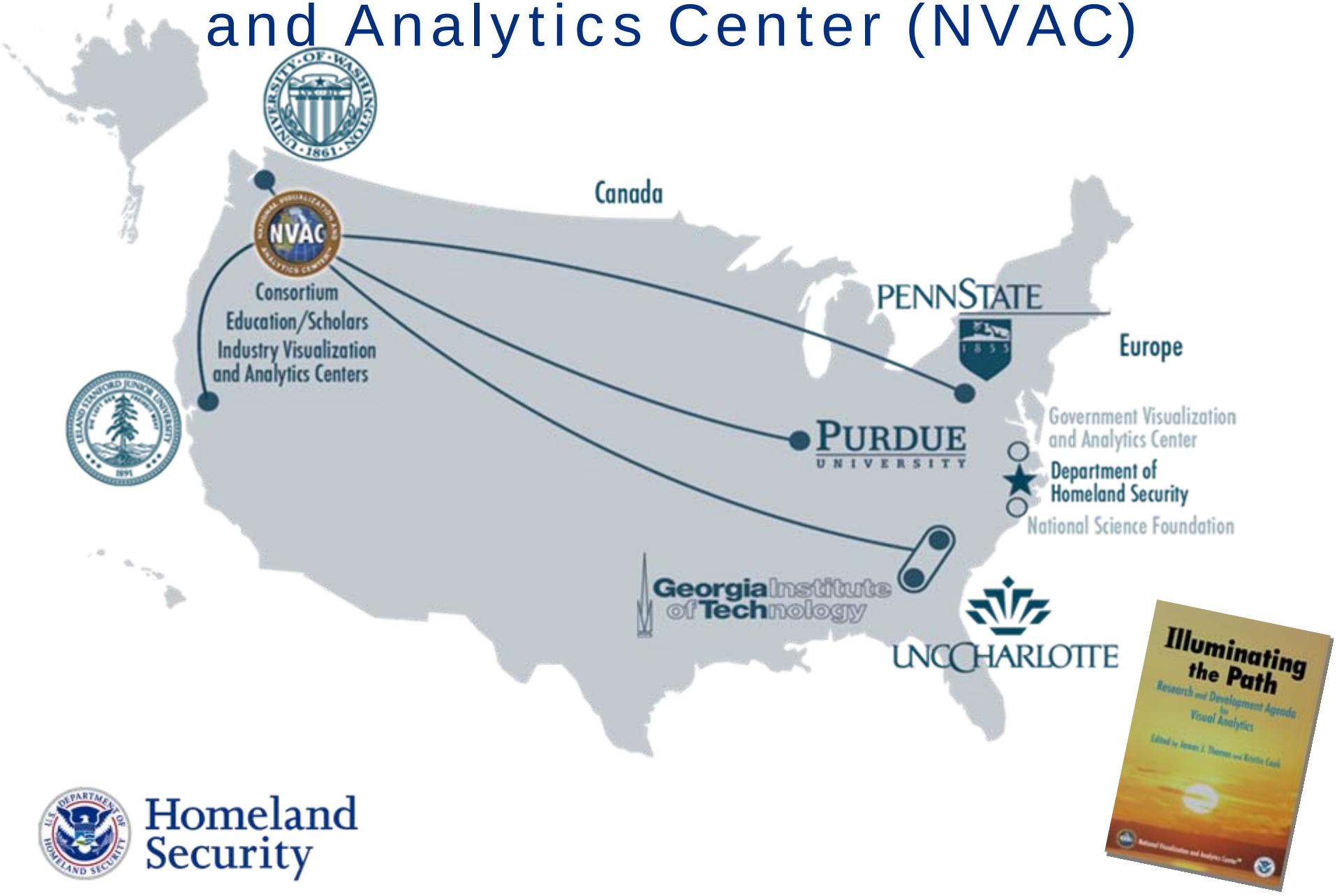
National Visualization and Analytics Center (NVAC)



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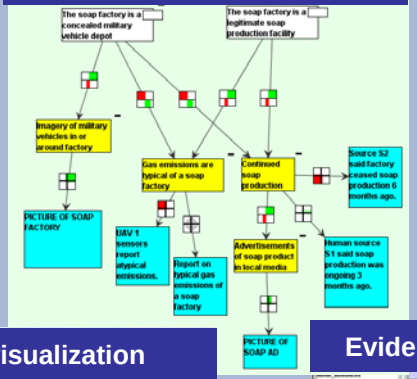
NVAC Research Highlights

Support for free-form reasoning, collaboration, and mobile analysis

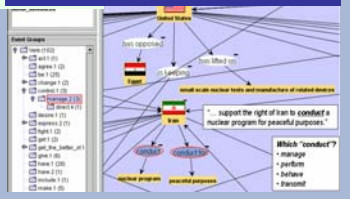
Hypothesis creation & validation

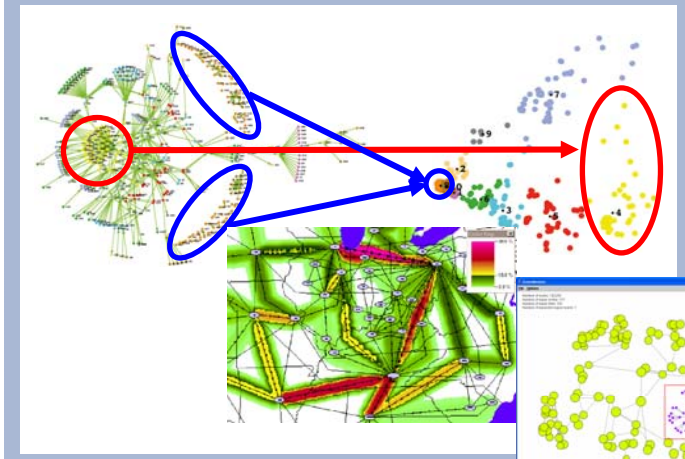


Development and evaluation of alternative scenarios

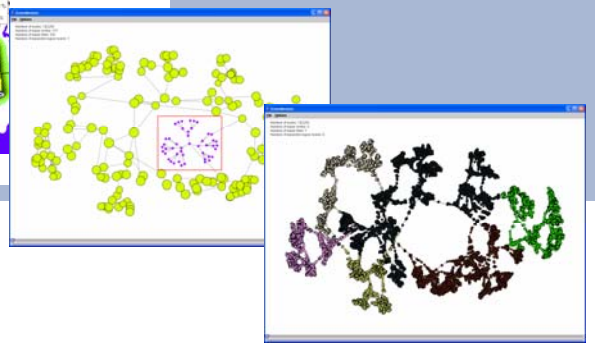
visualization

Evidence marshaling





Visualization and analysis of massive graphs



Real-time situational assessment

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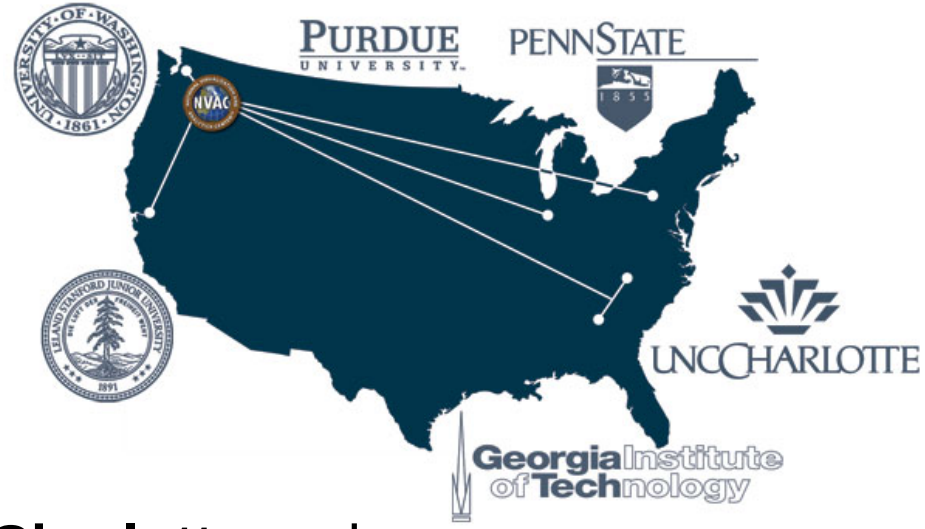
VAC Consortium: A Partnership Among Industry, Academia, and Government

RVAC Teams

- **Purdue University** with Indiana University School of Medicine (David Ebert)
- **Penn State University** with Drexel University et. al. (Alan MacEachren)



- **University of North Carolina Charlotte** and Georgia Tech (Bill Ribarsky and John Stasko)
- **University of Washington** et. al. (Tom Furness)
- **Stanford University** (Pat Hanrahan)

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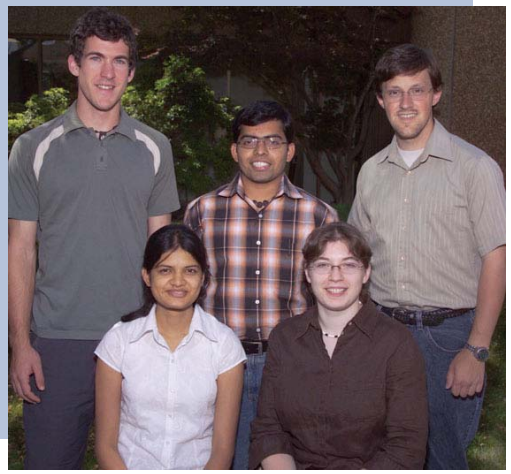
Education

- RVAC interns
- Interns and scholars
- Visual analytics curriculum and digital library
- Analyst internships
- IEEE VAST conference and graduate colloquium

Watch and Warn Training Class



2006 Interns

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Collaborating with the RVACs

- May 14-16: VAC Consortium Meeting + RVACs technical exchange
- Joint project opportunities
- Points of Contact:

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Stanford	Pat Hanrahan	hanrahan@cs.stanford.edu	(650) 723-8530

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Questions?