Contextualizing Hotspots A Visual Analytics Approach

Presented by: Ross Maciejewski Purdue University Regional Visual Analytics Center





Evaluation, Impact and Benefits

Visual Analytics for Syndromic Surveillance

- Syndromic surveillance is the detection of adverse health events focusing on pre-diagnoisis information to improve response time
- Integrated temporal, geospatial, multi-source, multi-scale analytic capability
- Systemic biological pandemic, syndromic, chem/bio/nuclear surveillance, management, and response

Discussion Topics

The visual representation of temporal data How to display multivariate spatiotemporal data (value patterns vs. spatial patterns)

Hotspot – Data Aggregation and Privacy Preservation

Hotspot

- An area in which an unexpectedly large amount of syndromes are occurring in space and time
- How to display geospatial data?
 - Individual locations give away private information
 - Aggregation by geographic boundary
 - Color as a function of percent syndromic?





Kernel Density Estimation

Problems with current methods:

- In rural regions, patient visits are sparsely distributed
- In urban regions, patient visits are closely grouped
- Density estimation model needs to handle both

Solution:

• Use a nearest neighbor approximation model to model urban and rural areas with different kernel window sizes

Kernel Density Estimation



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