Visual Analytics for Zoonotic Diseases and Syndromic Surveillance

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Foreign Animal and Zoonotic Disease and Human Health Visual Analytics

Overview

• Develop visual analytic environments to facilitate effective prediction, planning, evaluation, mitigation, response, and recovery for zoonoses and animal health issues

Areas of work

– Linked Animal Human health Visual Analytics (LAHVA)
– Disease visual analytics
– Animal disease health surveillance and investigation
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Projects

• Provide visual analytic environment for all IBOAH data (herd movements, reportable diseases, spread factors)

• Integrate FAZD data into a visual analytic environment linking multiple models (e.g., disease spread, economic impact)
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Projects

• Rift Valley Fever and other FAZD projects
  – Animal, human, and economic impact

• Comparative studies of sparse livestock data (Texas) vs. Indiana for policy studies

• Create visually effective mobile environment
Main Components

*Integrated models, collected data, simulations*

*Interactive, integrated environment with visualization, simulation, and analysis*

*Enables*

- Factor analysis (spread, economic impact, interdiction strategies)
- Hypothesis and consequence testing
Outcomes

- New biosecurity environment for preparing, surveillance, mitigation, management, response and recovery
- New integrated model and sensed data decision making environment
- Improved linked-model decision making for important and emerging biological and economic threats
- Scalable visual analytic technology from desktop to mobile device
Animal and Zoonotic Disease
Visual Analytics

**Initial results**

- Analyzed syndromic spread factors for national veterinary association to reduce production losses and disease spread
Initial results

• Analyzed public health effects from chemical spill in Fairburn, Georgia.
• Developed linked animal-human health surveillance system for more timely and accurate health monitoring and response.
• Investigated correlation of influenza symptoms in pets and humans for improved planning and response.
• Evaluated use of ProMed and VIN data sources for outbreak/event detection and monitoring.
Integrated Interactive Environment: Hypothesis Testing
Interactive Time Series Brushing and Prediction
Integrated Interactive Environment: Linked Views
Integrated Interactive Environment: Linked Views

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User selected alert

Data aggregation associated with alert
Other Applications - VALET: Visual Analytics Law Enforcement Technology
More information

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Collaborators:
• FAZD Center
• Ceratops (U. Utah)
• Indiana University School of Medicine
• Indiana Board of Animal Health
• Indiana State Department of Health
• Regenstrief Institute