

Symposium proposal submitted for 2012 AAAS Annual Meeting  
**16-20 February, 2012, Vancouver, Canada.**

**The American Association for the Advancement of Science (AAAS).**

Conference Theme: Flattening the World: Building the 21<sup>st</sup> Century Global Knowledge Society.

Proposed symposium format: (A **180-minute symposium** with six speakers).

Title of Symposium:

**Web Surveillance: Fighting Terrorism and Infectious Diseases (Accepted)**

Session Duration: 180-Minute Symposia

**Session Description: (1500 characters, including spaces).** Traditional approaches to understanding the spread of terrorism and infectious diseases are based on 20<sup>th</sup> century communication models —such as newsletters, face-to-face meetings, and clinic reports. With the new media (e.g., the Web and online social networks), scientists can trace geographic and chronological patterns to reveal the nature of significant events such as radical concepts or epidemic outbreaks. This symposium will focus on the advancement of web surveillance methodologies developed in the fields of information management, GIScience, linguistic ontology, complex networks, and epidemiology. Innovative web search tools, intelligence ranking algorithms, space-time analysis, user-generated contents, and social networks will be highlighted in the symposium to demonstrate this new research direction. The Web, a powerful platform for collective thinking and idea exchange, provides valuable intelligence to help scientists monitoring processes ranging in diversity from the spread of diseases to the structure of terrorist networks. The information dynamics can be transformed into visual maps and information landscapes for space-time analysis. Understanding the diffusion and cluster patterns in response to terrorist movements and epidemics may significantly facilitate intervention, and eventually, prevention responses. After this symposium, we will organize a special issue of Web Surveillance in a peer-review journal to disseminate these exciting findings.

**Keywords (Five):** Web surveillance, terrorism, infectious diseases, social networks, space-time analysis.

**Disciplinary Section Consulted:** Information, Computing, and Communications (T)

**Relevance to Theme or Special Relevance to the Audience (500 characters):**

This symposium is closely tied with the focus of the 2012 theme: using the power of electronic communications and information resources (the Web) to tackle the complex problems (terrorism and infectious diseases) at a global scale. We assembled prominent web surveillance studies from multiple disciplines with the focus of scientific theories and methodology developments. These cross-cutting research activities will improve our capability of fighting epidemics and terrorism in the future.

**Session Organizer:**

Ming-Hsiang Tsou

Professor, San Diego State University, 5500 Campanile Dr., San Diego, CA 92182-4493

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**Scheduling and Time Justification:**

This symposium has been supported by the chair of AAAS Information, Computing, and Communication (T) Section. The organizer (Tsou) will give a short introduction about this symposium, introduce speakers, and highlight key research challenges of web surveillance [**5 minutes**]. The first three speakers (Chen, Carley, and Tsou) will each present their research in the web-based analysis of terrorism networks and radical concepts [**60m**]. The two discussants (Cerf and Jezierski) will comment on the three research activities and lead discussions with the audience [**20m**]. Next, three speakers (Collier, Menczer, and An) will present their research related to social

networks and infectious diseases [60m]. Discussants will comment on the second part of presentations [20m]. Tsou will moderate the final discussion about the potential collaborations among speakers, discussants, and the audience, and discuss how to organize a special issue of Web Surveillance in a peer-review journal [15m].

**Categories:**

- 1. Information Technology and Computing.**
- 2. Health and Pharmaceutical Science**
- 3. Global Perspectives and Issues.**

**Section Member Affiliation:**

**Information, Computing, and Communication (T)**  
**Geology and Geography (E)**

**Moderator**

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**Discussant (confirmed):**

Vinton G. Cerf  
Vice President and Chief Internet Evangelist, Google.

**Discussant (confirmed):**

Eduardo Jezierski  
InSTEDD. Chief Technology Officer  
(the InSTEDD <http://instedd.org/> )

**Speaker**

**Hsinchun Chen** (University of Arizona, AAAS and IEEE Fellow), **confirmed**.

<http://ai.arizona.edu/hchen/>

McClelland Professor of Management Information Systems and Director, Artificial Intelligence Lab  
Eller College of Management  
The University of Arizona

**Presentation Title: Security Informatics: The Dark Web Experience**

**Talk Description (up to 500 characters, including spaces):** The talk will begin with the review of the new discipline of "Security Informatics." I will then present the NSF/DOD/DHS funded Dark Web project, which aims to collect comprehensive and longitudinal international terrorism and extremism related multilingual and multimedia web and social media contents. The project has also developed advanced computational techniques for Dark Web spidering, content/sentiment/social network analysis, and infectious ideas and violence modeling.

**Speaker**

**Kathleen M. Carley** (Carnegie Mellon University), confirmed

<http://www.casos.cs.cmu.edu/bios/carley/carley.html>

Kathleen M. Carley  
Professor, Institute for Software Research  
ISR, SCS, Carnegie Mellon University - 5130 Wean

**Presentation Title: Social Dynamics: Change in Web-Mediated Geographically Embedded Social Networks**

**Talk Description (up to 500 characters, including spaces):** Techniques that support rapid movement from data-collection to network analysis to simulation are needed to study both terrorism and disease spread. Such techniques are described and results provided. First, rapid network analytic techniques are used to pull

information from the web and classify it into meta-networks connecting who, what, where, why, how and when. Then, agent-based models are used to forecast change in the underlying groups when information is communicated through social media.

#### **Speaker**

**Ming-Hsiang Tsou** (San Diego State University), organizer. confirmed.

<http://geography.sdsu.edu/People/Pages/tsou/index.html>

Professor

Geography Department, San Diego State University  
5500 Campanile Dr., San Diego, CA 92182-4493

**Presentation Title: Mapping Ideas from Cyberspace to Realspace with Geospatial Fingerprints.**

**Talk Description (up to 500 characters, including spaces):** We developed a Spatial Web Automatic Reasoning and Mapping System (SWARMS) for visualizing the spread of concepts, ideas, and events in cyberspace ([mappingideas.sdsu.edu](http://mappingideas.sdsu.edu)). The resulting maps, integrated with GIS and web search engines, can provide visual information landscapes for identifying spatial clusters and unique patterns of submitted ideas or keywords. These dynamic information landscapes can reveal unique "geospatial fingerprints" associated with the contexts of different keywords.

**Nigel Collier** (National Institute of Informatics, Japan). confirmed

<http://sites.google.com/site/nhcollier/>

Associate Professor

The National Institute of Informatics (Japan).

**Presentation Title: Text mining in action: early alerting of disease outbreaks from online media**

**Talk Description:** Accurate and timely detection of infectious disease outbreaks is necessary to help support risk assessment and ultimately to save lives and livelihoods. The BioCaster and DIZIE projects exploit high throughput biomedical fact extraction from news media and user generated content in Twitter to detect norm violations in near real time. Challenges include: (1) bridging the gap between laymen's and expert's terminology, (2) interpreting evidence across documents, (3) providing realistic benchmarks.

**Filippo Menczer** (Indiana University). confirmed

<http://cnets.indiana.edu/people/filippo-menczer>

Associate Professor

School of Informatics and Computing  
Indiana University, Bloomington

**Presentation Title: Tracking the diffusion of ideas in social media**

**Talk Description:** Online social media are replacing personal social interaction and redefining the diffusion of information. Microblogs have become battle grounds for public relations, marketing, and politics. [Truthy.indiana.edu](http://truthy.indiana.edu) is a new Twitter-based research tool that combines social network analysis, text mining, and crowdsourcing to uncover misinformation and deceptive tactics. The real-time analysis of meme diffusion will have applications in the preservation of open debate and monitoring of radical ideas.

**Li An** (San Diego State University), and Sarah Wandersee. Confirmed.

<http://www-rohan.sdsu.edu/~lian/>

Associate Professor

Geography Department, San Diego State University

**Presentation Title: How do ideas spread over the Internet? Evidence from space-time analysis**

**Talk Description (up to 500 characters, including spaces):** An's talk aims to reveal patterns and potential driving forces behind the online diffusion of ideas. We first extend a few traditional metrics to measure spatial patterns at discrete times and space-time trajectories (e.g., LISA time paths). Second, we use the "hazard" concept to depict and quantify the risk of an area being dominated or substantially influenced by certain ideas. Survival analysis will be used to explore what factors may affect the spread of ideas over space and time.