



**Science & Technology Directorate
U.S. Department of Homeland Security
Workshop on
Emergency Management: Incident, Resource, and Supply Chain Management
(EMWS09)**

November 5-6, 2009

**Center for Emergency Response Technologies, UC Irvine
University of California, Irvine,
4100 Calit2 Building, Irvine, CA 92697-2800**

Overview

Emergency management refers to activities encompassing prevention, protection, response, and recovery. Emergency response consists of multiple functions performed immediately after an event: damage assessment, response needs assessment, response prioritization, coordination and mobilization of rescue operations, resource and logistic planning, evacuation planning, situation monitoring, and timely information dissemination to citizens and organizations. Among these vital steps to recovery, the ability to identify resource needs and get those resources to victims is critical.

Resource management coordination among all federal, state, local, tribal, private sector and non-governmental personnel is guided by the National Incident Management System (NIMS). Furthermore, the plan that establishes a comprehensive all-hazards approach to enhance the ability of the United States to manage domestic incidents is based on the National Response Framework which assigns responsibilities for identifying, obtaining, and delivering resources to victims. While NIMS provides a structure for organized effective execution of emergency response functions, this can only be accomplished in an environment where all response units can effectively share information. Challenges in meeting victim needs arise from the magnitude and geographic setting of the disaster, the level of coordination required across heterogeneous government organizations as well as the number of people involved in the operation. Effectiveness of response is incident specific and a function of providing the needed support when it is required at that particular time in the incident. A several hour delay in initiating some response actions could result in dire consequences that would impede critical response operations.

One fundamental cause for high response latency is the lack of effective resource delivery systems and resource management methodologies for information sharing among all stakeholders and their respective data management applications. This latency cause is further magnified by a lack of essential integration among vital functions (i.e., information stovepipes), notably: incident management at local and national levels and, resource/service and supply chain management. The delivery of resources is locked in these stovepipes of information with each having its own stakeholders and applications, generally unconnected. There is a need to explore how advanced technologies can be effectively used to identify the next generation of resource information sharing in order to improve overall emergency management.

**Workshop General Chair
Lawrence Skelly, DHS-S&T
(lawrence.skelly@dhs.gov)**

Program Chair/Co-chair

- **Nabil R. Adam, DHS-S&T**
(nabil.adam@dhs.gov) (Chair)
- **Sharad Mehrotra, UC Irvine**
(sharad@ics.uci.edu) (Co-Chair)

Program Committee

- Vijay Atluri, Rutgers U
- Chaitanya Baru, UCSD
- Ron Cabrera, Chief, LA County Fire
- Mani Chandy, CalTech
- Soon Ae Chun, CUNY
- Larry Collins, Captain, LA County Fire
- Mark Cooper, GOHSEP, State of Louisiana
- Jerry Couretas, Lockheed Martin
- Bruce Davis, DHS-S&T
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- David Ebert, Purdue U.
- Ron Eguchi, CEO, ImageCat Inc.
- Ahmed K. Elmagarmid, Purdue U
- Ramesh Kolluru, U of Louisiana
- Lei Lei, Rutgers U
- Brock Long, EMA, State of Alabama
- Mike Macedonia, Forterra Inc.
- Paul Matheis, Newport Beach Fire Dept
- James W. Morentz, SAIC, Inc.
- Steve Sellers, California Governor's Office of Emergency Services
- Basit Shafiq, Rutgers U
- Michael B. Smith, DHS-S&T
- Steve Stein, PPNL
- Nancy Suski, LLNL
- Bhavani Thuraisingham, UT Dallas
- Kathleen Tierney, Hazards Center-UC Boulder
- Jaideep Vaidhya, Rutgers U
- Linda Vasta, DHS-S&T
- Nalini Venkatasubramanian, UC Irvine
- Marianne Winslett, UI, Urbana-Champaign
- Brent Woodworth, SAHANA Software Foundation Board

Workshop Goals and Objectives

The objective of the workshop is to provide a forum for

- i) representatives from various government agencies and commercial resource suppliers to present their strategic vision of incident management, resource management, and supply chain management as intersecting disciplines not as separate stovepipes;
- ii) researchers from academia, industry and national laboratories to assess the state-of-the-art in logistics, identify related R&D challenges, and propose solutions to address these challenges;
- iii) subject matter experts, practitioners, state and local representatives to discuss their perspectives on the current state of resource management; where should the technology and science be in 5-10 years from now; why we are not there now - What are some of the challenges that are in the way of to be there now?; and why do we need to be there? That is, what legitimate case can be made to justify the needed R&D investments?

The results of the workshop will help DHS-S&T formulate near and long term investment decisions as well as research strategies, plans and objectives for next generation emergency management and response.

Classification

The workshop will be conducted as **Unclassified**.

Workshop Structure and Format

Format for the workshop:

- Keynote Speakers
- Panels, position papers, and posters presentations. The presentations and panels will be discussing background useful for the breakout sessions
- Breakout sessions and reports

Submission Requirements

Presentations at the workshop will be by invitation. If interested, please submit 3-page position paper (excluding references). Papers not selected for presentations at the workshop will be considered for a poster session.

The major themes of the workshop will focus on technologies that enhance:

1. Information Sharing among incident management, resource management, supply chain management applications
2. Resource Data Analytics for the purpose of more quickly assessing requirements
3. Interoperability among existing systems and how to achieve it
4. Standards, existing and emerging, and what can be borrowed from the commercial business sector which moves goods everyday

Sub-topics areas include:

- Infrastructure vulnerability; resilience to attacks and disruptions
- Multimodal transportation as a key component of supply chain
- Trust and privacy issues in organizational information sharing
- State-of-the-art incident logistics tools for data collection and sharing (such as barcode and RFID)
- Protocols and frameworks for scalable and reliable logistics information exchange
- Resource situational awareness and decision support technologies



Homeland Security

- Information integration challenges for dynamic virtual supply chain organizations that form in crises
- On-site, rapidly deployable multi-networks for reliable asset management data collection
- Agent-based coordination technologies; Multi-agent systems; Computational tools for distributed planning, scheduling, and control
- Virtual environments to support collaboration, planning, and operations
- Social networking for Incident Management team building and situational awareness

Paper Submission

Submission site: <http://www.easychair.org/conferences/?conf=emws09>

Important Dates

- **October 12, 2009** Extended Deadline for Position paper submission: **October 19th**
- **October 23, 2009**- Author notification
- **November 5-6, 2009**- Workshop

Registration

Workshop attendance is open subject to space availability, with **October 26 as the cut-off date**. Workshop registration is free. For registration detail and for an up-to-date copy of this workshop write up, please visit:

<https://www.enstg.com/signup/passthru.cfm?ConferenceCode=WOR77476>

Workshop Venue

This workshop is scheduled for November 5-6, 2009 at the Center for Emergency Technologies (CERT www.cert.ics.uci.edu) at the University of California, Irvine within the Calit2 building. Funded by National Science Foundation and the Department of Homeland Security, CERT has a relatively long history of exploring the application of advanced information technologies for crisis response in close partnerships with the first responder community.

Hotel Accommodation

<http://www.hiltonirvinehotel.com/>

Hilton Irvine/Orange County Airport
18800 MacArthur Blvd., Irvine, California 92612
Tel: 1-949-833-9999 Fax: 1-949-833-3317.

The hotel offers a block of rooms at the discounted rate of \$109.00 per night, with October 20, 2009 as the cut off date.

Travel

To get here from the John Wayne airport [SNA]: At the exit, turn right on to MacArthur Blvd. Follow for about two lights, then turn left on Campus Dr. Take Campus Dr. SE for about 2-3 miles. Turn right when you get to East Peltason/Berkeley. Stop and buy a visitors parking permit (\$8.00), then drive along East Peltason Drive (past 1 signal and 3 stop signs) until you reach the Anteater Parking Structure. Turn right into the parking structure.

To get here from LAX: Take Century Blvd. to the 405 South. Follow 405 south for ~45 miles until you get to the Culver exit. Exit Culver, turn right (SW) towards the UCI campus. When you get to Campus Drive, turn right. Follow Campus Drive to the second stoplight, then turn left on to East Peltason Drive/Berkeley. Stop and buy a visitors parking permit (\$8.00), then drive along East Peltason Drive (past 1 signal and 3 stop signs) until you reach the Anteater Parking Structure. Turn right into the parking structure.

Parking Permits: You will need to purchase a parking permit on campus. A one day general parking permit is \$8. For more information, please reference the UCI parking page:

<http://www.parking.uci.edu/>



AGENDA

**Workshop on Emergency Management: Incident, Resource, and Supply Chain Management (EMWS09)
Thursday November 5th, 2009**

7:30 – 8:00 am	Registration / Breakfast (Calit2 Atrium)														
8:00 – 8:10 am	Workshop Kickoff Nabil Adam , DHS S&T (Calit2 Auditorium)														
8:10 – 8:20 am	Sharad Mehrotra , UC, Irvine: Welcome Address (Calit2 Auditorium)														
8:20 – 8:30 am	Sue Bryant , UC, Irvine, Vice Chancellor (Calit2 Auditorium)														
8:30- 8:45 am	Lawrence Skelly , DHS S&T (Calit2 Auditorium)														
8:45 – 9:45 am	UICDS Demo (Chip Mahoney , SAIC) (Calit2 Auditorium)														
9:45 – 9:55 am	Coffee break														
9:55 - 10:55 am	<p>Panel: Government Perspective on Emergency Management Chair: Lawrence Skelly (DHS S&T) Panel Members: Larry Collins (LA County), Mark Cooper (Governor’s Office, State of Louisiana), Charles Hagan (Logistics Office, State of Florida), Shawn Matz (Logistics Branch Chief, FEMA) (Calit2 Auditorium)</p>														
11:00 – 12:00 pm	<p>Panel: Industrial Perspective on Response Technologies Chair: Ron Eguchi (ImageCat Inc.) Panel Members: Chip Mahoney (SAIC), Dale Svenson (Boeing), Scott Gregory (ESRI), John Ellenberger (SAP Research), Shawn Smith (Emergency Visions) (Calit2 Auditorium)</p>														
12:00 -12:45 pm	Lunch (Calit2 Atrium)														
12:45 – 2:00 pm	<p>Position Papers</p> <table border="1"> <tr> <td>Session 1</td> <td>Session 2</td> <td>Session 3</td> </tr> <tr> <td>Calit2 Auditorium</td> <td>Calit2 3008</td> <td>Calit2 4301</td> </tr> </table>			Session 1	Session 2	Session 3	Calit2 Auditorium	Calit2 3008	Calit2 4301						
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2:00 – 3:00 pm	<p>Panel: Virtual Worlds and Homeland Security Chair: Mike Macedonia (Forterra Inc.) Panel Members: Michael Pack (U Maryland), Ron Tarr (U of Central Florida), Randy Hill (USC), Walt Scacchi (UCI) (Calit2 Auditorium)</p>														
3:00 – 3:15 pm	Coffee break														
3:15– 4:40 pm	<p>Breakout Sessions</p> <table border="1"> <thead> <tr> <th>Session 1</th> <th>Session 2</th> <th>Session 3</th> </tr> </thead> <tbody> <tr> <td>Incident Level Response</td> <td>Regional Response</td> <td>Community Response</td> </tr> <tr> <td>Chair: Brent Woodworth Co-Chairs: Ellen Sogolow, Rufus Edwards</td> <td>Chair: Ellis Stanley Co-Chairs: Chuck Hagan, Carter Butts</td> <td>Chair: Bruce Davis Co-Chairs: Nalini Venkatasubramanian, Nancy Suski</td> </tr> <tr> <td>Calit2 Auditorium</td> <td>Calit2 3008</td> <td>Calit2 4301</td> </tr> </tbody> </table>			Session 1	Session 2	Session 3	Incident Level Response	Regional Response	Community Response	Chair: Brent Woodworth Co-Chairs: Ellen Sogolow, Rufus Edwards	Chair: Ellis Stanley Co-Chairs: Chuck Hagan, Carter Butts	Chair: Bruce Davis Co-Chairs: Nalini Venkatasubramanian, Nancy Suski	Calit2 Auditorium	Calit2 3008	Calit2 4301
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4:45 – 5:30 pm	Breakout Reports (Calit2 Auditorium)														
5:30 – 7:00 pm	Reception / Poster Session (Calit2 Atrium)														



AGENDA

**Workshop on Emergency Management: Incident, Resource, and Supply Chain Management (EMWS09)
Friday November 6th, 2009**

7:30-8:00 am	Breakfast (Calit2 Atrium)		
8:00-8:15 am	Welcome Back Nabil Adam , DHS-Science and Technology Directorate (Calit2 Auditorium)		
8:15 – 9:30 am	Panel: Emerging Cloud Computing Infrastructure and its Role for Emergency Management Chair: Mike Carey (UCI) Panel Members: Mike Olsen (Cloudera), Raghu Ramakrishnan (Yahoo), Gus Hunt (CTO, CIA), Todd Papaioannou (Teradata) (Calit2 Auditorium)		
9:30 – 10:45 am	Panel: Sensors and Emergency Management: What has been Achieved, Potential, and Related Challenges Chair: Mani Chandy (CalTech) Panel Members: Ron Cabrera (LA Fire), Andrei Shkel (UCI/DARPA), Bruce H. Varner , (Fire Chief, Santa Rosa) (Calit2 Auditorium)		
10:45 – 11:00 am	Coffee Break		
11:00 – 12:15 pm	Panel: New Issues and Challenges in Emergency Management of Pharmaceutical/Healthcare Supply Chain Chains Chair: Lei Lei (Rutgers) Panel Members: Beth E. Ford (IFF), Ron Guido (J&J), Michael Pinedo (NYU), Max Shen (UC, Berkeley), Michael Trocchia (Novartis) (Calit2 Auditorium)		
12:15 -12:50 pm	Lunch (Calit2 Atrium)		
12:50 – 1:20 pm	Position Papers		
	Session 1 Calit2 Auditorium	Session 2 Calit2 1322	Session 3 Calit2 4301
1:20 – 1:30 pm	Break		
1:30 – 2:45 pm	Breakout Sessions		
	Session 1	Session 2	Session 3
	Incident Level Response Chair: Brent Woodworth Co-Chairs: Ellen Sogolow, Rufus Edwards Calit2 Auditorium	Regional Response Chair: Ellis Stanley Co-Chairs: Chuck Hagan, Carter Butts Calit2 1322	Community Response Chair: Bruce Davis Co-Chairs: Nalini Venkatasubramanian, Nancy Suski Calit2 4301
2:45 – 3:45 pm	Breakout Reports (Calit2 Auditorium)		
3:45 – 4:00 pm	Closing Remarks Nabil Adam , DHS-Science and Technology Directorate (Calit2 Auditorium)		
4:00 pm	Adjourn		



**Workshop on Emergency Management: Incident, Resource, and Supply Chain Management
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 Paper Sessions
 Thursday, November 5th**

Paper Session 1	Calit2 Auditorium	05 NOV 09
Software-Defined Ultra-wideband Radio Communications: A New RF Technology for Emergency Response Applications Authors: Faranak Nekoogar and Farid Dowla		
Public-Private Partnerships: Key Drivers of Disaster Supply Chains Authors: Ramesh Kolluru and Mark Smith		
Distributed Information Sharing for Disaster Response and Recovery: www.VirtualDisasterViewer.com Authors: John Bevington, Beverley Adams, Enrica Verrucci, Paul Amyx, Charles Huyck and Ronald Eguchi		
Agent-based Evacuation Modeling: Simulating the Los Angeles International Airport Authors: Jason Tsai, Emma Bowring, Shira Epstein, Natalie Fridman, Prakhar Garg, Gal Kaminka, Andrew Ogden, Milind Tambe and Matthew Taylor		
Paper Session 2	Calit2 3008	05 NOV 09
Emergency Incident Management Author: Paul Matheis		
Speech-Based Situational Awareness for Crisis Response Authors: Dmitri Kalashnikov, Dilek Hakkani-Tür, Gokhan Tur and Nalini Venkatasubramanian		
A Policy Driven Meta-Alert System for Crisis Communications Author: Nalini Venkatasubramanian		
Design and Optimization of Agent-Based Emergency Supply Chains Authors: Ozlem Ergun, Pinar Keskinocak and Julie Swann		
Paper Session 3	Calit2 4301	05 NOV 09
Challenges in Evacuation Route Planning for Incident Management Author: Shashi Shekhar		
Technologies for Emergency Response Logistics Author: Shawn Smith		
Design of a Temporal Geosocial Semantic Web for Emergency Management Operations Authors: Bhavani Thuraisingham, Latifur Khan, and Murat Kantarcioglu		
Rapid Information Integration for Emergency Response Author: Naveen Ashish		



**Workshop on Emergency Management: Incident, Resource, and Supply Chain Management
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**Paper Sessions
Friday, November 6th**

Paper Session 1	Calit2 Auditorium	06 NOV 09
Information Management as the Key to Emergency Management Author: Paul Scerri		
New Challenges to Emergency Management of Pharmaceutical/Healthcare Supply Chain Disruptions Authors: S. Graves, L. Lei, B. Melamed, M. Pinedo, L. Qi, Z.J. Shen and X. Xu		

Paper Session 2	Calit2 1322	06 NOV 09
Multiagent Systems to Support Coordinated Emergency Management Author: Edmund Durfee		
Integrated Resource and Logistics Management through Secure Information Sharing for Effective Emergency Response Authors: Vijay Atluri, Soon Ae Chun, John Ellenberger, Basit Shafiq and Jaideep Vaidya		

Paper Session 3	Calit2 4301	06 NOV 09
When Disaster Strikes: Lessons from NGOs and Industry Emergency Supply Chains Authors: Ozlem Ergun, Pinar Keskinocak and Julie Swann		
Intelligent Agents and UICDS Authors: Clare Grasso, Tim Finin, Michael Grasso, Yelena Yesha and Anupam Joshi		