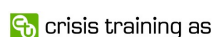


BRIDGE Newsletter

ISSUE 3 — DECEMBER 2012

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Editorial



Dear Reader!

The proof of the pudding is in the eating, they say. I am happy to say that the chefs of

the BRIDGE project have been busy cooking since our last newsletter, and that the fire fighters and end-users participating to our first demonstration were quite happy with consuming the results. However, before going into the details, let me recapitulate the past: in the first newsletter we introduced the conceptually simple concept of interoperability, but yet so hard to achieve. In the second newsletter we introduced the concepts we developed to show the value of interoperability in real life scenarios. Only one thing remained: the demonstration. Would our technology work?

End of September 2012 we gathered for a week deep inside a Swiss mountain to find out. During that week we staged an exercise for the local fire fighters

simulating a car explosion in a tunnel setting ablaze a set of other cars and a truck with toxic chemicals at the tunnel entrance. People were trapped in the cars, and a plume of potentially toxic gas filled the valley below threatening the local villages of Heidiland, and possibly drifting off to Zürich.

Would the BRIDGE ad-hoc network be able to relay information from the chaotic scene inside a mountain with no telecom infrastructure to the master table of the commanders? Would our resource manager know where the tagged people and resources were? Would our bracelets used to tag the victims be able to transmit vital information about the victims' condition to the health services right from the moment a victim was discovered until she could be safely evacuated? Would our blast simulator be able to predict the damages on the exploded car, and would the risk analyser be able to combine chemical and meteorological information to



Tunnel fire exercise at VSH, Flums, Switzerland, 20 Sept. 2012.
Photo courtesy: Max Wietek, VSH.

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advise to site commanders about evacuation? And could our training tools log information that would be valuable for the future training of the fire brigade?

This newsletter covers the first BRIDGE demonstration and the experiences gathered. In addition it provides links to our animation video showing the overall scenario BRIDGE addresses with a special emphasis on the simulation of critical infrastructure. Finally, we are very proud of our research results, and summaries of the most recent ones can be found towards the end of this newsletter. The full BRIDGE team remains at your disposal should you have any comments, questions and suggestions on any of the material presented in this newsletter. In the meantime we have started planning for our next demonstrations to be covered in depth in our next newsletters, so stay tuned to BRIDGE!

Geir Horn, SINTEF
Project Coordinator

First BRIDGE Demonstration: Interoperability

The goal of BRIDGE is to increase safety of citizens by developing technical and organisational solutions that significantly improve crisis and emergency management. The key to this is to ensure interoperability, harmonization and cooperation among stakeholders on the technical and organisational level.

scale emergency scenario involving a chemical disaster at a virtual facility called "ExploChemco". This will be an integrated exercise presenting the final results of the BRIDGE project.

The first BRIDGE demonstration was conducted in the controlled tunnel environment of the VSH Hagerbach

explosion in a two way road tunnel, which triggered accidents, fire and smoke, damaged and burned cars, trapped and injured persons, failed communication, as well as a damaged chemical lorry leaking a toxic substance outside the tunnel. The practical demonstration intended to show how fire fighters could potentially include the following BRIDGE concept cases in their work under realistic conditions of an emergency in a busy road tunnel:

- MESH;
- HelpBeacons;
- eTriage;
- Resource Manager;
- Master;
- Risk Analyser;
- LocalCloud;
- Information Aggregator;
- Training System.

These concept cases were developed in the first phase of the project based on the domain analysis and user needs formulated in participatory design workshops, field observations, End-User Advisory Board meetings and other internal workshops.

The demonstration was divided into the so-called cold run and hot run. The main purpose of the cold run was to show in detail how the BRIDGE concept



Demo team, headed by Thomas Kulbe, VSH (left), awaiting the start of the exercise. Photo courtesy: Max Wietek.

BRIDGE is aiming to demonstrate tangible results created during the different project phases and the demonstration work will show the integration of all parts of the solutions. A demonstration is also seen as a marketing tool in order to bring innovation closer to the market, which is very important for the developer as well as for the end-user. This research community – end-user interaction is part of the demonstration work, leading to a high degree of impact of the created solutions.

BRIDGE will perform a total of four demonstrators that are based on specific scenarios. Each demonstrator has a different focus, but all four are of consecutively increasing complexity. Demonstrator 1 deals with single components that have to show interoperability under harsh conditions. Demonstrator 2 is a table-top demonstration of a large-scale emergency addressing visualization and interaction. Demonstrator 3 focuses on multi-agency collaboration (technology) that will be shown in a real world setting. Finally, Demonstrator 4 is based on a large-

Test Gallery in Flums, Switzerland, on 20 September 2012. The objective was to demonstrate network infrastructure and interoperability among various BRIDGE concept cases developed during the first 18 months of the project. The demonstration was embedded in a firefighting exercise involving a car



Local fire engines at the entrance to the VSH Hagerbach Test Gallery. Photo courtesy: Max Wietek.

cases were integrated as a system of systems with the aim to optimize the emergency management. The reviewers and the end-users were guided through how the different concept cases were collaborating and how the information was flowing through the network infrastructure. The hot run demonstrated how BRIDGE could operate in a “real” emergency. It provided a glimpse on how the BRIDGE system could be included in the practices, how new practices could emerge around these artifacts and how ordinary processes would be influenced by using the BRIDGE technology.

Exercise

The exercise begins with the notification of St. Gallen’s emergency center by an eyewitness, who has stopped due to a traffic jam outside the tunnel. The eyewitness reports of an explosion he has heard inside the tunnel and the smoke coming out. The emergency center alarms the Fire Brigade Flums. Based on the received information, the local appointed Incident Commander decides to go with three fire trucks to the incident site. He also notifies a nearby hospital and orders an ambulance service. On the way to the incident site, the Incident Commander receives further information about the accident on his portable BRIDGE Master System.



Front officer approaching the accident scene.

Photo courtesy: Leonardo Ramírez Zúñiga, Fraunhofer FIT.

About 20 minutes later, the fire fighters arrive on scene. The Incident Commander gives a short brief of the situation using his transportable Master table (presented on a laptop during the



Firefighters rescue trapped people from the damaged vehicles.

Photo courtesy: Max Wietek.

demo) and the fire brigade splits up into teams that prepare for their operations based on specific roles and responsibilities.

While the front officer walks through the tunnel, he deploys in an ad-hoc fashion nodes that form the overall BRIDGE MESH network. The front officer is also equipped with a smartphone that discovers and associates to a set of BRIDGE HelpBeacons – Wi-Fi hotspots conveying emergency needs through their network SSID. Discovered HelpBeacons are published over the BRIDGE

involved in the accident and discovers a number of injured and trapped people in the hot zone. He locates a truck loaded with chemicals at the tunnel entrance, which he judges to be a potential danger due to a leakage. The Incident Commander informs the emergency center about the situation, mentioning the potential danger of a chemical release. The Emergency Centre initiates a risk assessment analysing the consequences of a potential leakage of chlorine from the truck.

Close to the hot zone the rescue and fire fighting units are introduced to the situation by the front officer. The paramedics start to triage the injured persons using the BRIDGE eTriage System. The persons trapped inside the cars are rescued with the help of a hydraulic cutter and transported to the ambulance vehicle waiting alongside the fire trucks. The triage information collected by the eTriage nodes will be presented on the BRIDGE Master table.

The Incident Commander receives the risk analysis related to the truck with chlorine and uses the Master table interface to invoke the BRIDGE Resource Manager for requesting extra fire fighters and a fire engine needed to handle the problems with the chemical truck. The demonstration of the BRIDGE system ends with the arrival of the requested resources, which the Incident Commander observes on the Master table. A total of about 40 Swiss fire fighters and paramedics from different rescue services of the Flums region participated in the exercise.

MESH

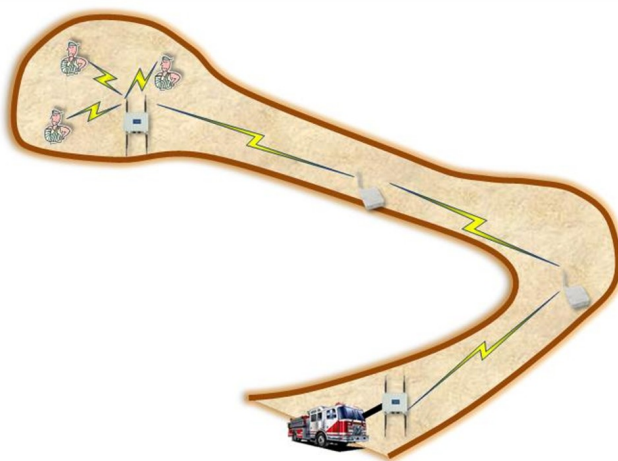
The BRIDGE MESH has the purpose of creating network coverage in unreachable areas and provide network services to those operating or captured in this area. During the first exploration of the area, emergency personnel deploys MESH bridges, which are ad-hoc



Final preparations before the demo.
Photo courtesy: Leo Ramirez.

routers equipped with multiple network interfaces. Depending on the devices in the area and the network interfaces of the closest MESH bridge, local network clouds are formed. Information is created in these local clouds and forwarded over the MESH backbone to the Incident Command.

During the Flums demonstration the MESH consisted of two Meshliums connected to power sockets and two



Demonstration set-up of BRIDGE MESH.

mobile OM2P routers as illustrated in the figure below. The OM2P routers were equipped with batteries and enclosed in prototypic water-proof carriers. The deployed routers used the standard OLSR routing protocol to create an ad-hoc route without pre-configuration.

The gateway Meshlium was connected to the local network and thus was able to reach the Master table via the S2D2S. The HelpBeacons from the smart phones and the eTriage tags connected to the Meshlium deployed next to the fire. In the Meshlium ran a daemon that wrapped the received data into the standard xml scheme and posted it to the S2D2S. The demonstration and the feedback from the end-users justified the BRIDGE MESH concept case. The main lesson learned was that the robustness and reliability of the MESH have to be improved. It became one of the topics of the new Robust and Resilient Communication concept case.

HelpBeacons

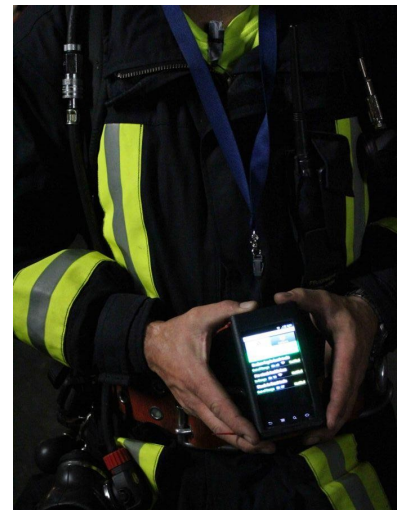
The HelpBeacons concept case explores the feasibility to use the SSID placeholder of Wi-Fi technology to convey emergency needs. Since an SSID signal is visible in a certain range and, moreover, the first thing people normally become aware of in terms of networks, we play with the idea of using it as a beacon to ask for help, to offer resources, or to disclose a location during a disaster.

We built a prototype and tested it several times inside the VSH underground test gallery be-



Testing technical feasibility of the prototype before the exercise. Photo courtesy: Leo Ramirez.

fore the exercise to make our implementation more robust. We placed several mobile phones in train wagons and other vehicles available in the facility. The large amount of steel inside the test gallery weakened the signals, but nonetheless, a fire fighter walking across the facility was able to quickly collect the help calls and have an idea



Front officer with a smartphone in search for HelpBeacons.
Photo courtesy: Reinier Timmer, Thales.

of how many trapped people were located in the wagons. As soon as the fire fighter can connect to the BRIDGE MESH, a list of discovered beacons is published to the BRIDGE Master. The intriguing experience we made shows a great potential in using the technology available today to improve collaboration between first responders and members of the public.

eTriage

The focus of the eTriage concept case for the Flums demonstration was to



eTriage bracelets.

Photo courtesy: Leo Ramirez.

put the prototypes through a realistic use and to test the inter-operation with the MESH and the Master table. We aimed to uncover problems and elicit suggestions from the fire fighters, paramedics, and other emergency responders in the exercise.

eTriage was used during the fire fighting exercise, when a fire fighter triaged victims just after eliminating the fire risk. The data were successfully transmitted over the MESH to the Master table and were also accessible via the triager's tablet devices. Sensor values were updated live; we could see how



Paramedics during the exercise.
Photo courtesy: Max Wietek.

the ambient temperature increased due to the fire and then decreased when the victims were transported to the assembly point.

Since there is no GPS reception in the tunnels, we also tested our concept of "scan-and-locate", in which the triager scans the victim's bracelet via RFID and taps the victim's position on a map on the triage tablet.

The eTriage concept was deemed to be successful. We did uncover possible problems due to interference of the signals and are working to solve them for the next iteration, where we will be extending the concept to include tagging and sensing of the environment as well as the victims.

Resource Manager

The BRIDGE Resource Manager supports the identification and discovery of various types of resources, the exchange of status information about

For this concept case, the focus of the first BRIDGE demonstration in Flums was on technical interoperability with the Master table and the exposition of its main functionalities. The concept case was used at the end of the demonstration scenario, where an Incident Commander at the Master table asked the Resource Manager for three additional fire fighters to come as quickly as possible to the incident site. A special software agent inside the Resource Manager fulfilled this request. Five smartphones of various types were used to demonstrate the way in which end-users of the system (in this case, fire-fighters) are able to use the Resource Manager. The actual location and movement of these end-users was simulated, since this part of the demonstration in Flums had to take place inside the Steigersaal meeting room, rather than at the actual incident site in one of the VSH tunnels. Nevertheless, all involved resources were visible as clickable icons on the interactive map



Five smartphones of various types were used in the demonstration.

Photo courtesy: Max Wietek.

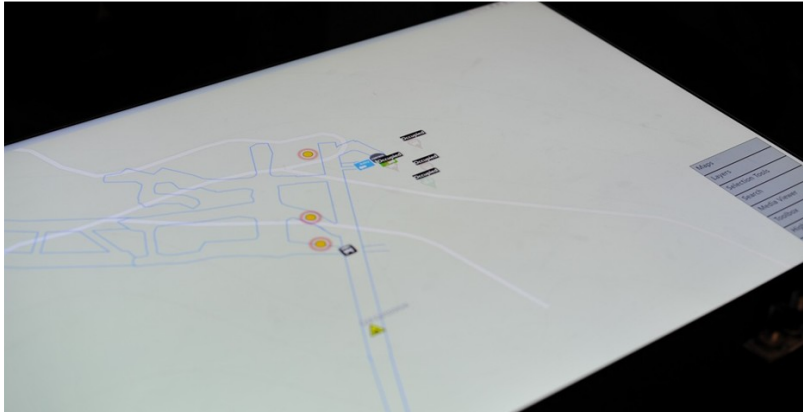
resources and the communication between (human) resources during crisis management. It runs as a distributed agent-based system on smartphones, tablets, laptops and in the cloud. Next to this, the Resource Manager is able to perform various additional tasks aimed at helping incident commanders to do their job. For example, in case there is a demand for additional certified first responders at a certain incident location, the Resource Manager is able to identify automatically those first responders which are available to do the job, have the required skills for it and are near to the incident site.

of the Master table: it was possible to follow exactly the movements of the fire fighters towards the incident scene and their collaboration in order to do this as quickly as possible. Flexible resource management is a very important aspect of emergency response in general. This makes the existence of a Resource Manager a clear necessity in the service landscape offered by BRIDGE. Next demonstrations need to show its value in a non-simulated setting, with a tighter integration into the demonstration scenario and with a more dynamic set of involved resources.

Master

The objective of the Master concept case is to show how to support decision-making for leaders in a large-scale emergency response involving different organizations.

- *Information about the response*, e.g., number and position of police, fire and health vehicles;
- *Information from external services*, e.g., weather conditions.



Master table with live data from other concept cases.
Photo courtesy: Leo Ramirez.

The Master provides functionality to present and act on three types of information:

- *Information about the incident*, e.g., incident location, number and triage status of victims;



Master table with a multi-touch screen.
Photo courtesy: Leo Ramirez.

During the demonstration the Master concept case exploited the Microsoft PixelSense, which is a large shared multiuser table PC, in which leaders can cooperate on information exchange and decision-making. The interaction is based on direct manipulation exploiting multi-touch, as well as using physical objects as part of the interaction.

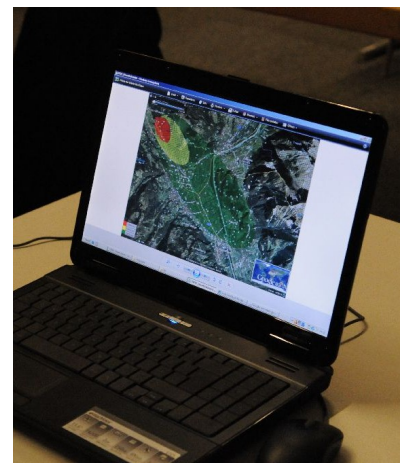
The Master concept case showed in Flums how to establish a common operational picture using services offered through LinkSmart from three different concept cases—HelpBeacons, eTriage, and Resource Manager.

HelpBeacons offered position and information from persons using the HelpBeacons application on their mobile phones. The eTriage offered triaging status and position of all victims. The Resource Manager offered the possibility to send tasking orders and get back updated status

of tasks and positions from fire personnel and vehicles. All this information was collected and presented using the Master concept case.

Risk Analyser

The BRIDGE Risk Analyser is a collaborative tool intended to support risk analysis in crisis situations. The basic idea is that graphical risk models for various types of facilities and scenarios are prepared in advance and stored in a library. The risk modelling language is designed to be easy to understand and well suited for use with an interactive touch interface. When an emergency occurs, the suitable risk model is selected from the library to serve a starting point to be tailored to the actual situation. This tailoring can be done, for example, by personnel located at a command centre away from the incident site, thereby supporting incident commanders and other responders.



Toxic plume estimation.
Photo courtesy: Leo Ramirez.

As time is crucial in emergency situations, the ability to easily update the risk model is essential. In Flums, we demonstrated basic editing functionality of the Risk Analyser deployed on a Samsung SUR40 interactive multi-touch table — BRIDGE Master. This functionality included adding and deleting risks, as well as inserting risk level assessments. Moreover, we demonstrated how the Risk Analyser can be utilised to obtain support from external experts via the Dynamic Expertise Integration Network (DEIN). In this case, the requests concerned estimations of the flow of a toxic plume that could potentially endanger a city.



Photos above: Actual vehicle before and after the explosion. Photo courtesy: Max Wietek.
Images below: Simulated vehicle before and after the explosion in 3ds-MAX.

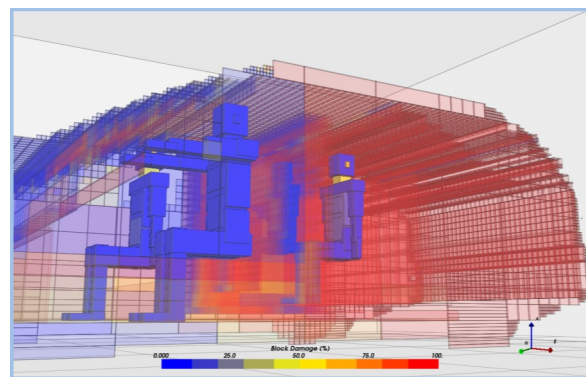
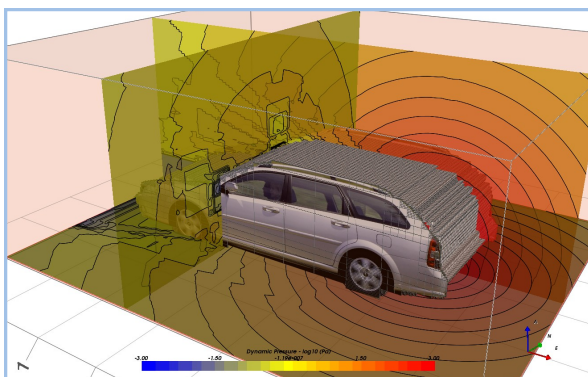
The Risk Analyser also facilitates participation of external 3D modelling experts. 3D models can be used both for training of first responders and for on scene application. The main objective of the training is to simulate the type of scenarios that are too expensive or even impossible to practice in reality (e.g., large industrial accident with a chemical release). The on scene application of 3D models can help emergency personnel improve the risk assessment capability and situational awareness and support decision making process by providing preliminary

information on (a) areas of increased risks for first responders (e.g., buildings and structures with a high probability of collapse), and (b) estimated number of casualties to be expected, as well as the type of injuries. Both sets of data assist in selecting the optimal protective equipment and prioritizing search and rescue operations.

In order to validate computer-assisted modelling, a test explosion of a passenger car was carried out in the VSH test gallery at the start of the demonstration. The resultant damage was then

compared with the damage estimations by different modelling software. The HEXDAM model (see below) was completed within 15 minutes after the explosion. The 3ds-MAX model (see above) required about 45 minutes.

The demonstration showed that the Risk Analyser has large potential for facilitating better risk analysis and more proactive thinking during a crisis. However, the quality and relevance of the risk models in the library are essential to fulfil this potential. It is also very important to keep the solution simple.



Right: HEXDAM model of the vehicle during the explosion.
Left: HEXDAM model of the damaged vehicle and injuries incurred by four passengers.

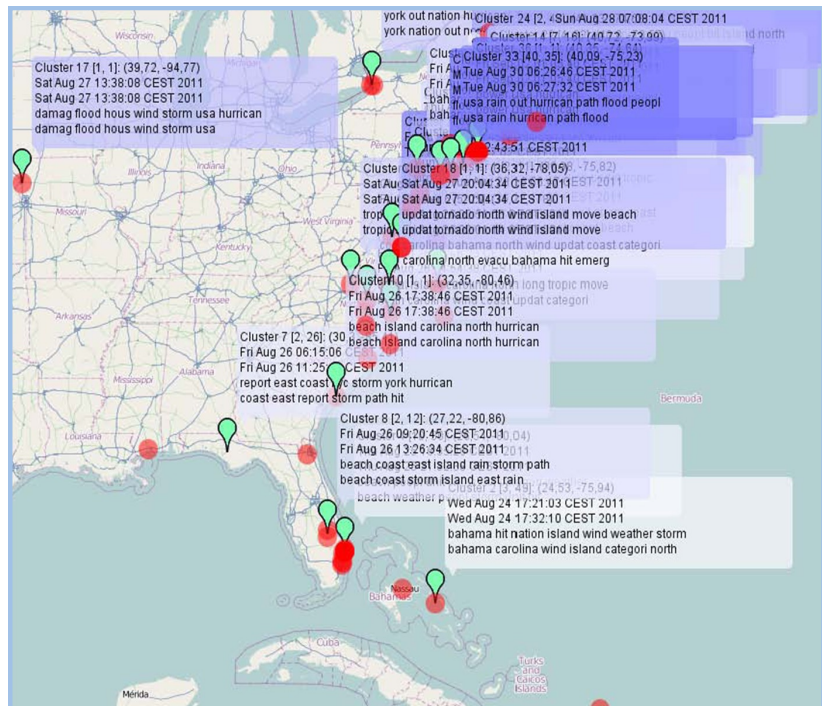
LocalCloud

The LocalCloud concept case enables spontaneous communication between proximate devices in P2P fashion. Via a story-carry-forward mechanism text or media can be relayed to social networks as Twitter or Facebook.

We tested an early prototype version during the first demo, using Wi-Fi technology interconnect mobile phones. Users were able to share content by the use of a Twitter client. Eventually, one phone relayed via 3G text messages to a dedicated Twitter account. Informal citizen response supported by information and communication technology is an emerging area, which definitely will be considered in the future efforts of the BRIDGE project.

Information Aggregator

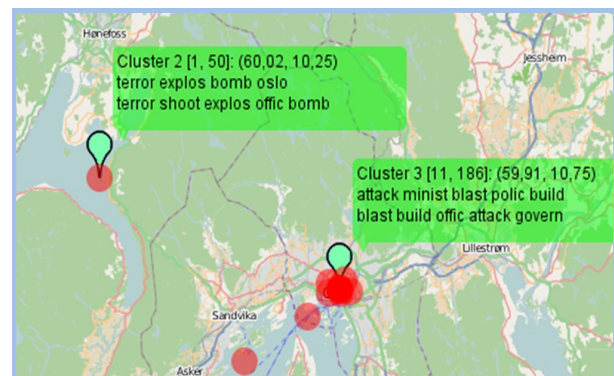
The BRIDGE Information Aggregator (IA) aggregates and processes data collected during an ongoing crisis situation. Currently, we focus on the processing of social media data gained during a crisis to support emergency management. Social media offers the possibility to include the public (opinion) from the very beginning into crisis management tasks. There are already intentions to use social media, especially by the police to gain a better situational awareness. Therefore, the Information Aggregator introduces the concept of “sub-event detection” as an aggregation technique. Sub-events are specific hotspots of a crisis that take place in the context of an event (or disaster). For example, the event could be the “Riots in London” where the sub-events are specific incidents/hotspots, e.g., the looting in London. The detected sub-events give some insights into the situation at hand and hints where emergency management has to focus on next.



Results of the aggregation from Hurricane Irene.

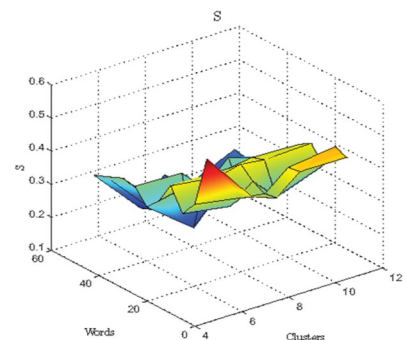
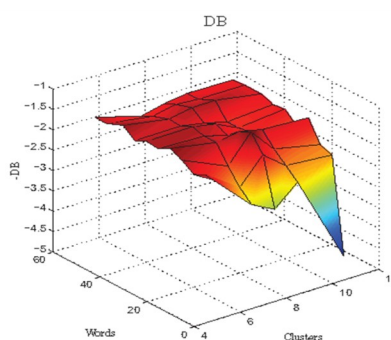
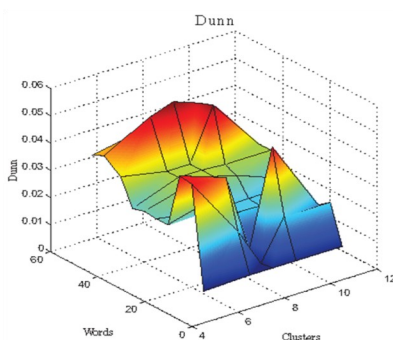
We demonstrated the Information Aggregator during the poster presentation in Flums. The poster summarized our findings related to the sub-event detection techniques applied to data from emergencies in the year 2011 (e.g., Oslo bombing and shooting, Hurricane Irene). The discussions during the poster presentation emphasized the importance of such an aggregation tool, due to the high information load caused by intense activities in social media. Social media is becoming an important communication tool that must be included in

emergency management to make the commanders aware of what is going on. In the future, we want to



Results of the aggregation from the Oslo data 2011.

strengthen our efforts in developing a solution for an on-the-fly data analysis with an appealing user interface.



Indices for the 2PG (2Phase Geo-based Clustering Algorithm) and UK Riot data set.

Training System

The BRIDGE Training System FRITS (First Responders Integrated Training System) will prepare individuals and organisations to be able to cope with changing expectations, change of supporting tools, as well as change of procedures. The essence is to develop a training concept that can adapt to these rapid changes to ensure an optimal preparedness. The final version of FRITS will offer a toolbox allowing scenario-based training in a fully controlled training environment, which also includes the use of operational equipment to enhance the realism in the training.

A step by step implementation of a learning and training methodology will result in an optimized baseline for the exercise. Based on the training objectives, a number of criteria will be defined assuring a structured retrieval of observations. This will give an optimal prerequisite for the evaluation and learning process.



Last-minute checking before the demonstration.

Photo courtesy: Leo Ramirez.

The exercise can also be enhanced with simulated environment to make it more realistic. It is, for instance, possible to exercise nuclear, biological or chemical accidents. It can also be used to provide operational systems with simulated exercise information. The exercise can be analysed in real time, thus giving the exercise management situational awareness of the exercise and the power to control the exercise to achieve the set objectives. After the exercise, all collected data is analysed and thematic reports can be generated.

The first demonstration in Flums focused on demonstrating the effect of using a well documented learning and training methodology and the use of the evaluation database. The

evaluation database received data from different sources. A number of first responders and "injured" actors were followed using android mobile phones with a training app, giving live information of each

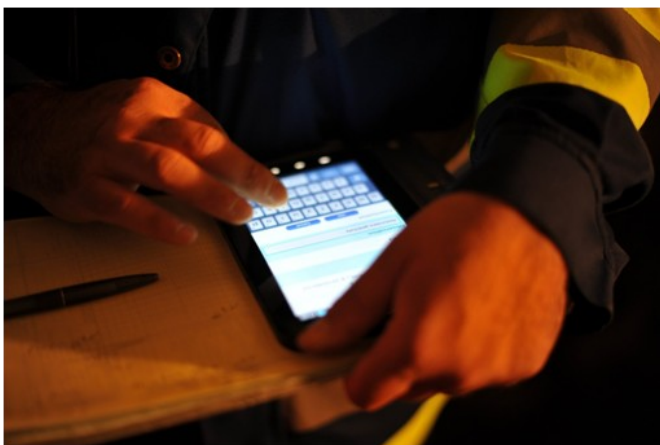
actor's unique status and position. Based on the defined training objectives, the voice communication of the Main Training Audience, in this exercise – the incident command team, was recorded to be used as input for optimal evaluation.

A number of appointed observers documented the training objectives using tablets with a predefined app assuring a structured retrieval of observations giving an optimal prerequisite for the evaluation and learning process.

Each observation collected position, video, footage, voice and text information from the exercise and was forwarded directly to the exercise Management Team, which could follow the status of the exercise in real time. Video cameras recorded the exercise to support the evaluation process with an overview picture of the exercise. Helmet-mounted video cameras were also tested during the exercise, to evaluate the potential effect one could have in the future evaluation processes.

The structured information gathering process resulted in a well documented footprint of the result of the exercise to be used in the first responder's evaluation process.

The response from the observers and appointed end-users was that the demonstrated features could optimize the process of assuring an optimal learning and training process. The user-friendliness was also assessed as a good feature of the demonstrated FRITS components.



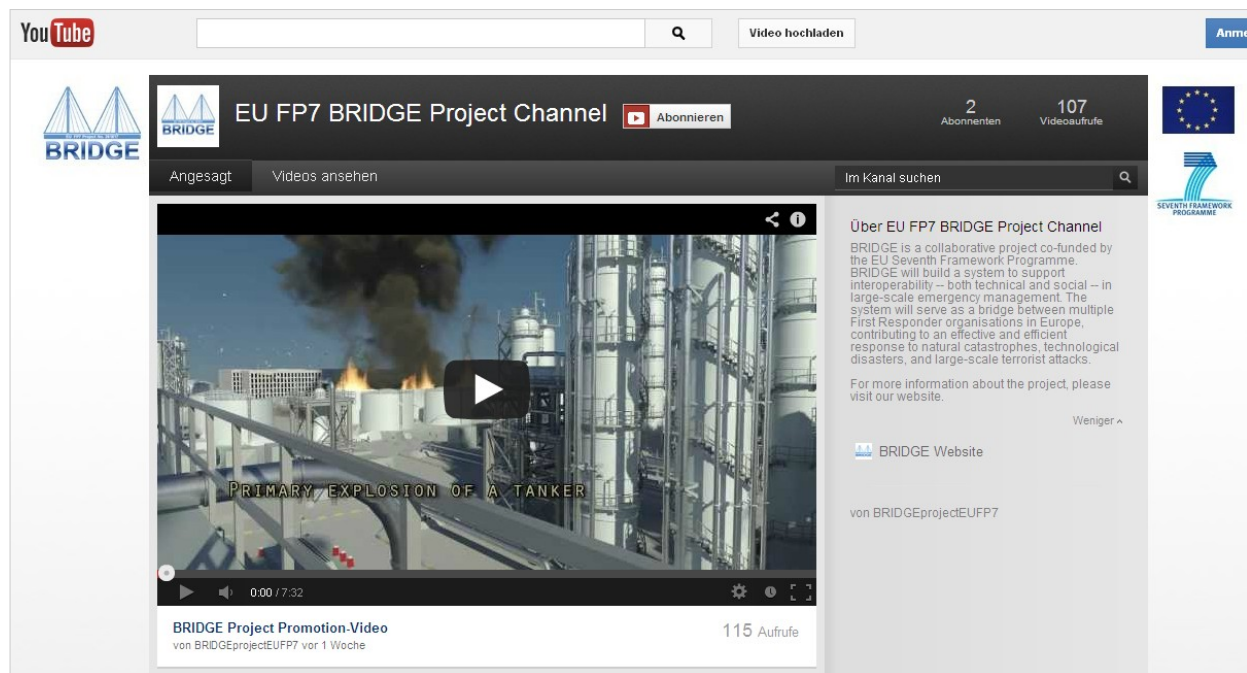
Swiss first responders trying FRITS Training System during the demo. Photo courtesy: Max Wietek.

BRIDGE Promotional Video Available on YouTube

We are pleased to announce the release of the BRIDGE promotional video! The video is based on a 3ds-MAX simulation of a major industrial accident at the virtual ExploChemco facility. This scenario was chosen by the BRIDGE consortium as a basis for the develop-

ment of the BRIDGE platform that will provide technical support for multi-agency collaboration in large-scale emergencies by ensuring interoperability, harmonization and cooperation among stakeholders on the technical and organisational levels. The video

demonstrates some of the components of the BRIDGE platform – [BRIDGE Concept Cases](#). Please go to the [BRIDGE YouTube Channel](#) at <http://www.youtube.com/user/BRIDGEprojectEUF7?feature=watch> to watch the video.



BRIDGE Partners Will Co-chair ELSI Track at ISCRAM 2013

ISCRAM



We are pleased to announce that the track *Ethical, Legal and Social Issues (ELSI) of IT Supported Emergency Response*, proposed by BRIDGE consortium member Lancaster University, has been accepted for ISCRAM 2013 under the theme *Emergency Management Information Systems*.

Emergency Management Information Systems (EMIS) support novel forms of collaboration between diverse parties – from statutory emergency agencies through local authorities, humanitarian organizations and volunteers, to members of the public. The ELSI track will explore critical ethical, legal and social issues and innovative responses in policy, practice and IT design.

The track will be co-chaired by BRIDGErs Monika Büscher and Lisa Wood (Lancaster University). More information about the track and its topics can be found on the conference website: http://iscram2013.org/sites/default/files/ISCRAM2013_ELSI.pdf.

The [Panel on 'Ethical, Legal and Social Issues of IT Supported Emergency Response'](#) – run as part of the ELSI track – brings together a group of experts who will discuss issues raised as part of the special track. Topics will include privacy, technology usability and cost, transformations of professional accountability, issues of social justice, and societal challenges such as surveillance and a militarization

of everyday life. Confirmed participants include Hayley Watson, Trilateral, UK, Heiko Werner, Federal Agency for Technical Relief (THW), Germany, Monika Buscher, mobilities.lab, Lancaster University (Chair).



Lisa Wood and Monika Büscher.
Photo courtesy: Max Wietek.

BRIDGE Scientific Results

ICMLA 2012

12-15 December 2012

Daniela Pohl (University of Klagenfurt, Austria) presented a paper at the 11th International Conference on Machine Learning and Applications (ICMLA 2012) held in Boca Raton, Florida, USA. The paper, co-authored with Abdelhamid Bouchachia (Bournemouth University, UK) and Hermann Hellwagner (University of Klagenfurt, Austria), described their research on automatic identification of crisis-related sub-events using clustering.

Aml for Crisis Management Workshop

13 November 2012

BRIDGErs Ragnhild Halvorsrud and Michael Stiso (SINTEF) co-organised a workshop in conjunction with the International Joint Conference on Ambient Intelligence (AMI2012) held in Pisa, Italy, 13-15 November 2012. The workshop entitled *Applying AMI Technologies to Crisis Management* brought together researchers and practitioners working on the application of *Ambient Intelligence* to crisis and disaster management and promoted better understanding of the strengths of the Aml paradigm, challenges to its application, and its potential in the development of innovative solutions. Three BRIDGE papers were presented at the workshop:

- *Response to Emergence in Emergency Response* co-authored by Lisa A. Wood, Monika Buscher (Lancaster University) and Leonardo Ramirez (Fraunhofer FIT);
- *Key Challenges in Multi-agency Collaboration During Large-scale Emergency Management*, co-authored by Aslak Wegner Eide, Ida Maria Haugstveit, Ragnhild Halvorsrud, Jan Håvard Skjetne and Michael Stiso (SINTEF); and
- *BRIDGE Risk Analyzer: A Collaborative Tool for Enhanced Risk Analysis in Crisis Situation*, co-authored by Mass Soldal Lund and Atle Refsdal (SINTEF).

The workshop was jointly organized by three ongoing FP7 projects - *MIRROR*,

Societies and BRIDGE - that investigate ICT support for crisis management from different perspectives.

PLoP 2012

19-21 October 2012

René Reinert (Fraunhofer FIT) presented a paper at the 19th Conference on Pattern Languages of Programs (PLoP 2012), which took place in Tucson, Arizona, USA. The paper, entitled *An Approach to Evolutionary Design Pattern Engineering* and co-authored with Ragnhild Halvorsrud, Aslak Wegner Eide (SINTEF) and Daniela Pohl (University of Klagenfurt), will be published during the first quarter of 2013 within the ACM Digital Library.

45th Session of Int'l Seminars on Planetary Emergencies, 19-25 August 2012

Friedrich Steinhäusler (University of Salzburg) presented a paper at the 45th Session of the International Seminars on Nuclear War and Planetary Emergencies organized by the World Federation of Scientists (WFS) in Erice, Sicily, Italy. The paper analyzed the gap in security and counterterrorism research initiatives of the European Union and will be published in the Science and Culture Series: *Nuclear Strategy and Peace Technology* (Series Editor and Chairman: Antonio Zichichi), World Scientific.

Participatory Design Conference

12-16 August 2012

Lisa Wood (Lancaster University) presented a paper at the 12th Participatory Design Conference, held in Roskilde, Denmark, 12-16 August 2012. The title of the paper, co-authored with Monika Buscher (Lancaster University), was *Reconfiguring Possibilities in Crisis Situations: an Agential Realist Approach to Participatory Design*.

PATTERNS 2012

22-27 July 2012

A BRIDGE paper co-authored by Alfred Zimmermann and René Reinert (Fraunhofer FIT) was presented at

PATTERNS 2012, the Fourth International Conference on Pervasive Patterns and Applications, which took place in Nice, France. The full title of the paper is *Pattern Innovation for Architecture Diagnostics in Services Computing*.

WISES 2012 Workshop

5-6 July 2012

Christian Raffelsberger (University of Klagenfurt) presented a paper at the Workshop on Intelligent Solutions in Embedded Systems (WISES 2012) organized by Lakeside Labs in Klagenfurt, Austria. The paper, entitled *Evaluation of MANET Routing Protocols in a Realistic Emergency Response Scenario*, was co-authored with Hermann Hellwagner.

Workshop & International Conference on Video Analysis, 5 July 2012

Lisa Wood (Lancaster University) presented a paper entitled *On Missed Beginnings* at the Workshop and International Conference on Video Analysis, which was held in Bayreuth, Germany. Monika Buscher was a co-author of the paper.

21st IEEE International Conference

25-27 June 2012

Two BRIDGE papers were presented at the Collaborative Technology for Coordinating Crisis Management (CT2CM) track of the 21th IEEE International Conference *Collaboration Technologies and Infrastructures* held in Toulouse, France:

- *Supporting Crisis Management via Sub-Event Detection in Social Networks* co-authored by Daniela Pohl, Abdelhamid Bouchachia and Hermann Hellwagner (University of Klagenfurt) and
- *Agile Response and Collaborative Agile Workflows* co-authored by Lisa Wood, Monika Buscher (Lancaster University), Bernard Van Veelen (Thales), and Sander Van Splunter (Technical University of Delft).

You can find more on these project results at: <http://www.bridgeproject.eu/en/bridge-results/publications>.

BRIDGE at a Glance

BRIDGE will build a system to support interoperability — both technical and social — in large-scale emergency management. The system will serve as a bridge between multiple First Responder organisations in Europe, contributing to an effective and efficient response to natural catastrophes, technological disasters, and large-scale terrorist attacks.



“The project will look in particular at how cooperation among different agencies and organisations can be made more efficient at national and transnational level.”

EU finances BRIDGE project
to tackle major disasters,
News Medical,
26 August 2011

The vision of the BRIDGE project is to:

- ◆ Facilitate cross-border and cross-agency collaboration
- ◆ Allow the creation of a common, comprehensive, and reliable operational picture of the incident site
- ◆ Enable integration of resources and technologies into workflow management
- ◆ Enable active ad-hoc participation of third parties

CONSORTIUM

The BRIDGE consortium consists of a well-balanced mix of cross-disciplinary academics, technology developers, domain experts and end-user representatives:

- ◆ Stiftelsen SINTEF, Norway
- ◆ Almende B.V., The Netherlands
- ◆ CNet Svenska AB, Sweden
- ◆ The Fraunhofer Institute for Applied Information Technology FIT, Germany
- ◆ Lancaster University, UK
- ◆ Crisis Training AS, Norway
- ◆ SAAB Training Systems, Sweden
- ◆ Thales Nederland B.V., The Netherlands
- ◆ Alpen-Adria University of Klagenfurt, Austria
- ◆ Paris-Lodron University of Salzburg, Austria
- ◆ VSH Hagerbach Test Gallery LTD, Switzerland
- ◆ Technical University of Delft, The Netherlands
- ◆ Stockholm University, Sweden
- ◆ Helse Stavanger HF, Norway

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For more information, please visit the project website: <http://www.bridgeproject.eu>.

