

~ The Rapid Responder ~

The Newsletter of the RAPID RESPONSE INSTITUTE

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**MONMOUTH
UNIVERSITY**

where leaders look forwardSM



Rapid Response Institute
Established 2004

**PREVENT
PROTECT
RESPOND
RECOVER**

The Rapid Response
Institute

will celebrate its

5th Anniversary
and
Student Reunion

August 2009

U. S. Army Awards The Rapid Response Institute \$3.2 Million Contract For Homeland Security Research

The Rapid Response Institute has been awarded a \$3.2 Million FY2009 DoD Senate Appropriations to develop and prototype a “**Rapid Information Sharing for Event Decision Support**” (RISES) database system that will enable the Joint Warning and Reporting Network (JWARN), Joint Effects Model (JEM), and other military classified systems to effectively share tactical information (plume spread, chemical identity, voice and video, GIS map information, etc.) through a web portal in real time in support of catastrophic events without disclosing the classified source of the information. This initiative continues to build on the Institute’s programs with the Edgewood Chemical Biological Center, CERMUSA of St Francis University, Ft. Monmouth PEO-C3T, Ft. Dix Northeast Regional Response Center and will foster partnering on a critical public mission with key state and local agencies. Work on this contract should begin summer of 2009.

Monmouth County Awards The Rapid Response Institute \$42,000 Grant to Conduct Pilot School Safety Exercise Using FloorView Software

The State of New Jersey has made school safety a priority. Personnel from the Office of Emergency Management (OEM), Prosecutor’s Offices, local fire, police and school officials of the various counties in the State have already conducted numerous school safety initiatives (lockdowns, evacuations, fire drills, etc.)

A pilot exercise will be conducted at the Colts Neck High School to assess the response to an incident at the school and to evaluate some technologies to aid in that regard. The objectives of the pilot are:

1. Develop knowledge from a live emergency management exercise to improve the response to an incident at a high school.
2. Evaluate the ability of FloorView, a software product, to improve the response to such a high school incident.

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Private Sector Symposium on New York—New Jersey Metropolitan Region's Critical Infrastructure

On July 14, 2008, the RRI participated in a program entitled: A Private Sector Symposium on the New York—New Jersey Metropolitan Region's Critical Infrastructure. The program, which featured a scenario-based facilitated discussion, took place at the New Jersey Institute of Technology in Newark, New Jersey.

The Keynote presenter was Mr. James Eberwine, Lead Forecaster at the National Weather Service, Mt. Holly, New Jersey. Recognizing that although the chances of a Category 2 or 3 hurricane strike remain moderately low, it is only a matter of time before one hits the New York and New Jersey area. The Symposium, which was aimed at building on the Hurricane Symposium held at Stevens Institute of Technology in 2007, included both public and private sector participants and attendees from both New York City and New Jersey. The program objectives included:

- Establishing a collaborative forum to share information among government, academia, and the private sector;
- Exploring critical infrastructure interdependencies and the potential for cascading failures during/ following disasters;
- Anticipating potential consequences to the region if critical infrastructure is lost before or during the event;
- Highlighting private sector critical infrastructure concerns.

The symposium was sponsored by the New Jersey Business Force, AIG and NJIT.

RRI Presents at Chemical and Biological Defense Physical Science & Technology Conference

RRI team members Barbara Reagor, Jim Hammill, Al Milewski and Bob Kelly traveled to New Orleans, LA to participate in the Chemical and Biological Defense Physical Science and Technology (CBD PS&T) Conference held November 17-21, 2008.

Professors Milewski and Kelly presented their paper entitled "Usable Information Delivery for Emergency Decisions," and Dr. Reagor and Jim Hammill presented a poster entitled "Communicating Decisions When There is No One to Talk To." A small replica of their poster presentation can be seen on the RRI bulletin board located next to the RRI office in the Howard Hall Link.

NJ Universities Homeland Security Research Consortium Holds 8th Statewide Homeland Security Symposium

On Friday, December 5, 2008, Drs. Barbara Reagor and William Tepfenhart presented a comprehensive review of the current research programs and awards of the RRI at the NJ Universities Homeland Security Research Consortium's Statewide Homeland Security Research Symposium held at Princeton University. The panel was entitled "The Rapid Response Institute – Four Years Later."

RRI and CERMUSA conduct AHETT Design Workshops



Monmouth University's Rapid Response Institute (RRI) and Saint Francis University's Center of Excellence for Remote and Underserved Areas (CERMUSA), in fulfillment of the Department of Defense Contract to develop an All Hazards Exercise Training Tool (AHETT), have been busy conducting a series of workshops with members of the first responder communities in both coastal New Jersey and central Pennsylvania.

The RRI and CERMUSA are in the process of holding end user workshops with potential users of the tool. One recent workshop was conducted on November 14, 2008, at Monmouth University, which was attended by 8 members of the emergency management community, and another was held on January 15, 2009, at CERMUSA, St. Francis University, in Loretto, PA, which had 10 emergency responders in attendance. These workshops will help determine design requirements for the AHETT tool.

After first giving the attendees an overview of AHETT, there was an open-ended discussion regarding their different training experiences. Discussion then focused on the importance of different training goals in an effort to prioritize "what to train," which was followed by a "walk through" of a current vision of AHETT via two training exercises in an effort to glean their feedback on various aspects of AHETT on:

- Presentation of information
- Interaction with the trainees
- Methods for providing feedback on the trainees' performance.



**MU Professor Allen Milewski presents AHETT to
Emergency Managers at January 15, 2009, Workshop at
CERMUSA, St. Francis University, in Loretto, PA**



**MU Drs. William Tepfenhart and Barbara Reagor
collaborate during the January 15, 2009, Workshop at
CERMUSA**

RRI Participates in STAR-TIDES Demonstration

By: James Hammill, Senior Researcher

On October 6 – 10, 2008, Senior Researcher James Hammill, Chief Technology Officer William Tepfenhart and Professor Jiacun Wang traveled to Washington, DC with the Joint Mobile Command and Training Center “Truck” to participate in the annual STAR-TIDES Fall Field Demonstration at the National Defense University (NDU). STAR-TIDES, which stands for “Sustainable Technologies, Accelerated Research – Transportable Infrastructures for Development and Emergency Support” indicates in its event literature that it “promotes affordable, sustainable, support to stressed populations – post-disaster, impoverished, or post-war.”

The overarching goal of STAR-TIDES is to find *Fast, Cheap and Sustainable – “Tech Heavy”* solutions and products that can be moved in quickly and easily and used without the aid of “any” critical infrastructure. Items used during the demonstration included solar cooking panels, portable generators, water filtrations systems (and everyone had water or coffee from Potomac River) satellite communication systems, and portable shelters which can be used in environments from the desert to the jungle to the arctic. Everyone and everything in the demonstration was “off the grid” – no city power, communication or water... if you couldn’t produce what your technology needed to operate, you couldn’t participate.

Monmouth University’s JMCTC (Joint Mobile Command and Training Center “*The Truck*”) demonstrated the ability to provide “real time” C4ISR (command, control, computers, communication, intelligence, surveillance, reconnaissance) for a shared common operating picture to emergency managers from the civilian, state, federal and military responder arena—all operating at the same time in the same space.



Joint Mobile Command and Training Center at the
Fort Belvoir’s Defense Threat Reduction Agency during the CWID ‘07

Rapid Response Institute

Presents Research to ECBC, U.S. Army

On Monday, February 9, 2009, the Rapid Response Institute presented its research and prototypes to date on the All Hazards Exercise Training Tool Phases I and II to the members of ECBC (Edgewood Chemical and Biological Command) during a One-Year Program Review held in the RRI Trailer at Monmouth University. Project Manager William Ginley, together with Donald Macfarlane, Virginia Pippen and David Drummond of ECBC, attended the review. Also in attendance were: John Sklinar, Director of Special Projects at the Northeast Regional Response Center at Fort Monmouth; Michael Shanafelt, Steve Bickford and Ashok Bapat (via Videoconference) of CERMUSA, Saint Francis University; and the Professors and Student Researchers of the RRI. STE Dean Michael Palladino also greeted the attendees.

Highlights of the review included:

- Dr. Barbara Reagor gave an overview of the program to date as well as different projects we either have or anticipate participating in with the JMCTC Truck.
- Professors Robert Kelly and Allen Milewski gave overviews of the AHETT Design Workshops with Emergency Managers conducted in both New Jersey and Pennsylvania and the feedback gleaned from them.
- Professor William Tepfenhart reviewed the BDIw Agent (Belief, Desire, Intention) and had adjunct and student researchers demonstrate different elements of it:
 - Message Distribution—Public/Subscribe Service: Presented by Michael Tarullo, Adjunct Researcher
 - GT Simulator: Demonstrated by Student Researcher Alex Karpodinis
 - EOS Resource Management: Demonstrated by Student Researcher Walter Seme
- Michael Shanafelt, CERMUSA, provided an overview of the surveys they have conducted in Pennsylvania on the AHETT Training Tool, such as the method used to conduct the surveys, as well as the results and data compilation.
- All discussed the projects pending, such as the Colts Neck High School Pilot Program and other proposals that have been submitted.

Delivery of AHETT Phase I (Federal Contract No. W911SR-07-C-0074) took place on June 19, 2009, and AHETT Phase II (Federal Contract No. W911SR-08-C-0083) will continue until July 17, 2010.

Following a working lunch, an afternoon session was conducted regarding the FY09 3.2 million dollar award for the **“Rapid Information Sharing for Consequence Management and Decision Support”** (See Page 1 of this Newsletter for details).

The Real Students of the Rapid Response Institute

Our Current Student Researchers:

Undergraduate Students: Larry Brewer; Gary Frattalone; Anthony Imperiale; Alexander Karpodinis; Regina Mushrock; Walter Seme; Mike Sergio.

High School Students: Glenn Crystal; Timothy Higgins.; and Kyle Fisher.

The student employees of the **Rapid Response Institute** contribute much to the research conducted by the Institute. Here they share a little of their experiences working with the RRI:



Gary Frattalone:

"Here at the Rapid Response Institute, I work to address many of our marketing activities. I feel that many people out there don't realize the unique capabilities of this Institute to produce highly effective emergency response technologies, so I am currently producing a number of videos to build more awareness in the minds of our audiences."



Walter Seme:

"I am one of the Student Research Developers at the Rapid Response Institute. Here we are developing software that will hopefully be used to train first responders. The current project that I am working on is called the All Hazards Exercise Training Tool (aka AHETT). The specific component of this project that I am working on is the Belief, Desire, Intention, and Control (BDIC). This will be used as the Artificial Intelligence for the AHETT. This project is written in JAVA. The BDIC's capabilities and potential seem endless, and we are excited to see how it will grow."



Regina Mushrock:

"Currently I have been working with CERMUSA, the Monmouth County OEM, and Professor Robert Kelly to create a survey for first responders that is aimed at giving us a better understanding of what tools they use during training and in the field. The results of this survey will help guide future development of the RRI's All Hazards Exercise Training Tool (AHETT) to complement the needs of the responders and those protecting the community in the event of a disaster. I have also created a Common Alerting Protocol (CAP) Table that describes a series of messages for the Nor'Easter training scenario displayed using the DECIDE system. In addition, I have been working alongside Gary Frattalone, another student researcher, to create videos for the RRI. Lastly, I will be assisting Professor Kelly and co-worker Anthony Imperiale in a pilot program for FloorView."

The Real Students of the Rapid Response Institute

(Cont'd from Page 6)

Did you know . . . ?

Since its inception in 2004, the RRI has utilized the research talents of:

14 MU Graduate Students

23 MU Undergraduate Students

7 High School Students . . .



Alex Karpodinis:

“Over the past few months I've been busy developing the Simulation Engine for Emergency Response (SEER), the World component of the AHETT Training System. This simulator engine is being designed to support a number of disaster types, including (but not limited to) riot, fire, flood and earthquake. It currently supports two- and three-dimensional spaces and models varying levels of population movements and attitudes. Since this is a training engine, real-time information systems have been implemented, including a casualty/damage reporting mechanism, with more planned and others in development. The available level of customization is high, offering great flexibility in areas such as the passage of time, the intensity and burning speed of fire, sea levels, and weather-related factors like wind direction and speed.”



Larry Brewer:

“Along with Walter and Michael I also am one of the Student Research Developers at the Rapid Response Institute. The current project that we are working on is creating some of the components that will make the All Hazards Exercise Training Tool (AHETT) seem more realistic. Our team is working on ways for the responders to train in a way that will immerse them in the training just like a simulator. I hope to accomplish this by creating ways for AHETT to interact with trainees by telephones and other forms of communication like Email and SMS Messaging.”



Mike Sergio:

“I am researching and developing a brand new type of state-based decisioning system designed by Professor Tepfenhart. My research involves delving into the psychology of practical reasoning and developing a system to model it. The development is challenging but highly rewarding when the system makes proper decisions.”

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The Real Students of the Rapid Response Institute

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The Student Researchers conduct their work in the RRI ARFOR Trailer, which is located between the Edison Science Hall and the Great Lawn



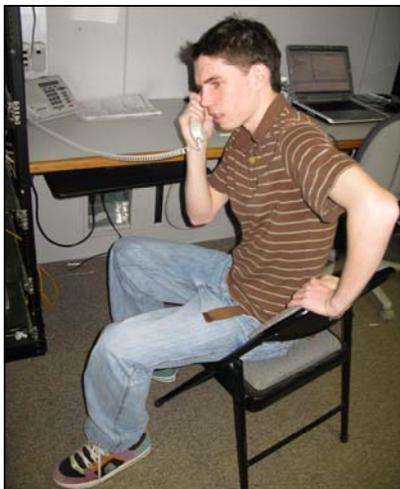
Anthony Imperiale:

"While working with the RRI I have researched and implemented several pieces of software such as FloorView and several resource databases. By becoming fully literate within the FloorView interface, I was able to populate all the data as well and demonstrate it with ease. Several resource databases such as the RDDB and Iris were used by the RRI to help research the availability of resources within a given radius. While researching these databases, I discovered the local areas that could help the RRI in their specific expertise. I highly enjoy working in the RRI, not only for the purpose assisting the school, but also to help work for a better tomorrow."



Glenn Crystal:

"My name is Glenn Crystal; I have been fascinated with computers and technology my whole life. At the age of 11, I taught myself how to build my own websites and started developing a website for my father's Chiropractic Office. Having great passion for learning to program, I got an Xbox and proceeded to learn how to hack it in order to run my own linux web server. This sparked an interest for me to not only learn how to program and develop software, but to learn and understand the hardware in order to most efficiently utilize it. Currently I am 17, I attend Point Pleasant Borough High School, and work at the Rapid Response Institute at Monmouth University. I have been engaging in research with my co-workers in fields that span from Graphical User Interfaces which will simplify the use of applications to users like you to communicating information over the internet, email, text messaging, and more. I still maintain my father's website that has a very informative blog that he updates on a weekly basis without ever contacting me."



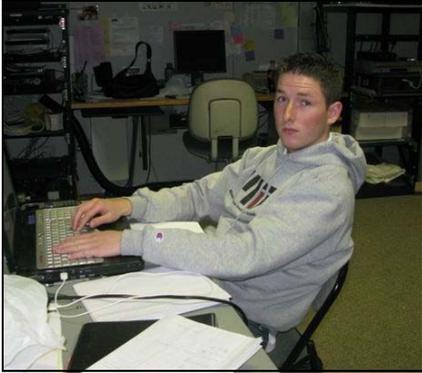
Tim Higgins:

"Since the summer of yesteryear, I have been developing an interface that allows easier manipulation of our system data. With my interface, tasks can be completed easier as the steps to modify values have been greatly minimized. Throughout the building process, I have had the opportunity to learn much in the fields of security and validation. In the field of emergency response, the sooner tasks are completed, the better. It is my hope that my interface will allow faster completion of the system, eventually allowing more lives to be saved."

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**Kyle Fisher:**

“Currently at the RRI, I am working on integrating the BDIW Agent with Microsoft Exchange to make it a more convenient and compatible software suite. J-Integra is a high performance middleware bridge that enables Java Exchange interoperability. Its pure Java implementation of the DCOM wire protocol allows you to access Exchange server objects such as folders, messages, contacts, tasks, and calendar items from Java clients. J-Integra for Exchange can be used in two different ways: as Point-to-Point Interoperability service, or as a Web Service Adapter.

The Real Students of the Rapid Response Institute

(Cont'd from Page 8)

~ Congratulations ~

RRI 2009 Graduates
Regina M. Mushrock
and
Anthony S. Imperiale



On May 20, 2009, Ms. Regina M. Mushrock (BS—Communications, Minor Criminal Justice) and Mr. Anthony S. Imperiale (BS—Software Engineering) joined the ranks of the MU Alum as they received their respective degrees at the 75th Monmouth University

Commencement Ceremony at the PNC Arts Center, Holmdel, New Jersey. RRI Director Barbara T. Reagor and RRI Chief Technology Officer William M. Tepfenhart, on behalf of the entire Rapid Response Institute Team, congratulate Regina and Anthony on their accomplishments and wish them much success in their future careers.

RRI Nominates
Regina Mushrock
for MU Student Employee
of the Year Award

The RRI was proud to nominate Regina M. Mushrock for the MU Student Employee of the Year Award for 2009. Regina worked with the RRI since October 2006 until her graduation from MU on May 20, 2009. She and all of the student employee nominees were recognized at a reception held in their honor on Friday, April 17, 2009, at the Magill Commons Club Dining Room. Regina is pictured at right with (from L to R) Dr. Barbara Reagor, Professor Robert Kelly and Dr. William Tepfenhart, who also attended the reception to show their appreciation.



RRI conducts Pilot High School Summer Research Program



The two teams of high school students and their high school teachers in the Research Lab

During Summer 2008 the Rapid Response Institute initiated a pilot high school program to engage talented high school students to work on software development teams. The intent of the program was to expose students to real world research projects, allow them to exercise and increase their computer skills, and expose them to Monmouth University.



Dr. Tepfenhart meets with high school researchers Stefan Stark (Holmdel HS) and Tim Higgins (Pt. Pleasant Borough HS) in the Research Lab

Two teams were formed from Holmdel and Point Pleasant High Schools. The Holmdel Team developed the web software to enable the configuration of databases for the simulation module of the All Hazards Exercise Training Tool. The team consisted of Holmdel High School teacher and Monmouth University alum Mat Weisfeld and students Julianne Waxman, Julianne Kuczinski, and Stefan Stark. The Point Pleasant Borough Team was responsible for the family of Java adapters that effect communications with the simulation module of the All Hazards Exercise Training Tool. The team consisted of Point Pleasant Borough High School teacher and Monmouth University alum Nicholas Gattuso and students Kyle Fisher, Timothy Higgins, and Glenn Crystal.

The program was extremely successful and culminated in a final presentation of their work to President Gaffney, Dean Palladino, members of the Boards of Education in their respective school districts, as well as the students' parents on August 28, 2008. The RRI plans to seek grant funding in order to expand on this successful program this summer!



President Paul Gaffney and STE Dean Michael Palladino address the group of high school students, their families, and Board of Education members at the Final Research Presentation on August 28, 2008.

MapSketch

Rapid Response Institute Members Submit Patent Application and Receive NJ Tech Council Award



The MapSketch Invention Team (From L to R):
Robert Bekefi; William Tepfenhart;
Lauren Landrigan; Barbara Reagor and
Allen Milewski

Director Barbara T. Reagor, Chief Technology Officer William M. Tepfenhart, Professor Allen E. Milewski, Tech Support Specialist Robert Bekefi, and MU Software Engineering Master's Degree recipient Lauren Landrigan, all working with the Rapid Response Institute, have submitted a formal patent application for their **MapSketch*** invention. **MapSketch***, a low-cost interactive tabletop display, is designed for use in an Emergency Operations Center (EOC). It combines the advantages, while eliminating the disadvantages, of both paper and digital maps.

Utilizing inexpensive, off-the-shelf technology, **MapSketch*** works by digitally capturing handwritten alterations made to the paper map; this "digital markup data" is contained in a small file that can be transmitted electronically to the responders in the field and/or another EOC. Thus, as the **rapidly changing information** emerges, the EOC is able to electronically transmit it to those who need it in a fast, effective, and efficient manner.

MapSketch*

Paper Maps are common because they are:

- Familiar and need little training
- Robust – e.g. against coffee spills
- Portable e.g. without batteries
- Flexible and provide both detail and overview

But, users cannot:

- Switch between information "layers"
- View dynamic information
- Easily store and share annotations

MapSketch* provides both advantages

***Patent Pending**

In addition, Lauren Landrigan, as co-inventor with Professors Milewski and Tepfenhart, Tech Specialist Bekefi, and Director Reagor, accepted an award from New Jersey Technology Council for one of the **Top Five Innovative Products of the Year for the MapSketch invention** at the 3rd Mid-Atlantic Defense Homeland Security Showcase which took place at Sarnoff in Princeton, New Jersey on June 19, 2008.



Lauren Landrigan is pictured with the NJ Tech Council Award and the MapSketch Prototype

Drs. William Tepfenhart & Richard Scherl Deliver on Contract with Lockheed Martin Corporation

In December 2008, Drs. William Tepfenhart and Richard Scherl completed work on a contract with the Lockheed Martin Corporation entitled the "2008 IRAD Project: Tool Integration Framework." The work entailed the development of software and configuration files needed to produce a mapping between two ontologies.

In recent years, the use of ontologies to represent the semantics of data has become more and more widespread. But the problem is that different groups use different ontologies. Therefore, it is necessary to develop ontology mappings to determine what is the relationship between two different ontologies. Richard Scherl states, "Our tool is a prototype of a new method for proposing relations between the categories of two ontologies. The categories may be identical or one may be a subcategory of another. The mappings provided by the tool enable the identification of related portions of data annotated by the different ontologies."

The provided software analyzes two or more ontologies written in the Owl ontology language. Owl is now the standard ontology language for the semantic web. Bill Tepfenhart states, "Widespread adoption of ontologies and appropriate mapping mechanisms has the potential to significantly change how computers inter-operate. We believe that our approach has the potential to significantly ease ontology mapping for the future."

The delivered results included the tool, user manual, as well as documentation about the methodology. Future work will extend the approach in a number of directions.

RRI Visits NJ State Office of Emergency Management

By: Professor Robert Kelly

On December 2, 2008, several members of the Rapid Response Institute visited the New Jersey State Office of Emergency Management at the Regional Information Operations Center (RIO) in Trenton. This visit was a follow up to a visit that the State OEM team made to RRI earlier in the 4th quarter.

The intent of both visits was mutual information sharing and an assessment of possible collaborative activities. Some work in this area had begun with RRI having access to a State-developed application that has been deployed that allows local emergency management organizations to enter their emergency management equipment into a database accessible by all other organizations statewide. RRI was designated a municipality to allow our viewing all data for research purposes.

For the visit to Trenton, we brought the Joint Mobile Command and Training and Center (JMCTC) vehicle for their examination. We also discussed areas in which they are active, including some GIS activities. The result was the determination to sign an MOU as the umbrella under which collaborative activities could occur including, but not limited to, their use of the JMCTC in State-sponsored emergency management exercises.