FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM

Visit to University of Kansas: April 15, 2015

This report summarizes the visit of **Mr. Ronald T. Eguchi** from ImageCat, Inc. that took place at the University of Kansas on April 15, 2015.

ITINERARY OR AGENDA

Time:	Activity:
745	Student Chapter President meets & welcomes Mr. Ronald Eguchi.
815 - 835	Tour of West Campus Geotechnical Lab with Dr. Jie Han.
845 - 930	Tour of West Campus Structural Lab with Chapter President.
945 - 1030	Tour of Kansas Applied Remote Sensing (KARS) program with Kevin Dobbs, project leader.
1030 - 1040	Tour of Learned Hall Structures Lab, Kathleen McElrath.
1045 - 1050	Concrete Canoe Demonstration, Bill Hirchert Team Captain.
1100 - 1115	Tour of Fluid Mechanics Lab and sediment flow demonstration, Evan Deal.
1130 - 1215	Tour of Unmanned Aerial Vehicle (UAV) lab, and presentation on UAV remote sensing application, Dr. Haiyang Chao.
1215 - 1230	Prepare for Presentation, meeting with IT representative.
1230 - 1415	Informal Lunch and break.
1500 - 1600	Presentation at Spahr Engineering Auditorium.
1615 - 1745	Break
1800 - 2100	Dinner with local engineering firm, faculty members, student chapter members, and graduate students at local restaurant.

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER: Donald J. Spradling, EIT, Student Chapter President, djspradling@ku.edu

- Rouzbeh Khajedehi, Student Chapter Vice President, rkhajehdi@ku.edu
- Jian Li, PhD. Assistant Professor. Student Chapter Faculty Advisor, jianli@ku.edu
- Michael Becker, EIT. Professional Engineering Consultants.michaelbecker@pec1.com
- Michelle Ashline. Administrative Assistant, Turner Construction. mashline@tcco.com

VISITING PROFESSIONAL LECTURE OVERVIEW

Mr. Eguchi presented *Earthquakes, Hurricanes, and other Disasters: A View from Space,* to an audience of 80+ faculty, industry professionals, and primarily civil engineering and geography students. The topic of his presentation concerned the manner by which members of the geospatial community are able to coordinate their efforts during instances of natural disasters.

EERI was credited with promoting central repository for imagery data which could then be used by various professionals responding to the incidence who could benefit from the remote sensing data. Mr. Eguchi demonstrated the use of imagery processing software applied to visual imagery data in order to assist with change detection and identify areas which have been exposed to damage. The process was applied to imagery from disasters in Iran, as well as the aftermath of Hurricane Katrina in New Orleans. Mr. Eguchi expanded the discussion to include the method by which crowdsourcing could be used to gather valuable data which would otherwise be difficult to obtain during a crisis event.

Mr. Eguchi ended the presentation with a call to action for those who would be able to assist EERI with their endeavors of reducing damage and impact from earthquakes and other natural disasters. He emphasized the mission of EERI and highlighted the benefits of membership with a local chapter as well as national membership and continued involvement.

Lecture Abstract

Include an abstract of the topic(s) covered during lecture/seminar. In many instances, disasters act as catalysts in the adoption of new and emerging technologies. Spawned by the need to rapidly collect vital information for disaster management, technology innovations have often helped emergency responders to assess the impact of large disasters more efficiently and rapidly, and to track and monitor progress in critical response and recovery operations. Some examples of where technology implementation has been driven by the occurrence of a major disaster include Hurricane Andrew in 1992, where the lack of rapid damage or situation assessment tools hindered the deployment of federal resources and thus identified the need for near real-time loss estimation methodologies; the 1994 Northridge Earthquake where GIS took center stage during the initial response and recovery periods by providing important visual and spatial information on critical operations; the World Trade Center attacks which demonstrated the potential use of remote sensing technologies for damage assessment and recovery; Hurricane Katrina in 2005 where the deployment of GPS-based, field survey technologies helped to freeze in time the damage and destruction of this disaster so that researchers could study the effects of significant wind and flood hazards in a more comprehensive and complete manner; and the 2010 Haiti earthquake where hundreds of volunteers worldwide helped to quantify the devastation caused by this event using a "crowdsourcing" platform called GEO-CAN (Global Earth Observation – Catastrophe Assessment Network). All of these events underscore the opportunities that emerge when time-critical information can be delivered more efficiently to users making critical decisions during the disaster.

One technology which has had an enormous impact on disaster management has been remote sensing. In the past several decades, this technology has been used extensively to explain the extent of impacts caused by earthquakes, tsunamis, hurricanes, floods, wildfires and terrorist attacks. Through high-resolution optical imagery and active sensors (e.g., synthetic aperture radar, or more commonly known as SAR, and light detection and ranging or LIDAR), remote sensing technologies have demonstrated significant efficacies in quantifying post-disaster damage, monitoring recovery and reconstruction progress after significant disasters, and more recently, in developing information on our urban infrastructure. One main reason for this rapid progress has been the introduction of high-resolution, commercially-available satellite imagery. Where these technologies used to be available to mainly government agencies (mostly military), they have now become readily accessible to the public. The impact of this development has been most noticeable – in my opinion - in the disaster management area.

This presentation will focus on the integration of remote sensing technologies in all aspects of disaster management, i.e., disaster preparedness, mitigation, response and recovery. In order to demonstrate their efficacy in these four areas, cases histories and examples from recent disasters, including the Indian Ocean

earthquake and tsunami, Hurricane Katrina, the Haiti earthquake, and the Tohoku, Japan earthquake and tsunami will be presented.

Finally, the presentation will end with a view towards the future. What new developments can be expected in technology development and implementation, what future challenges must be overcome to realize broader application of these technologies in future disasters, and what role will our younger researchers play in institutionalizing these technologies as essential tools in disaster management.

Professional Bio

Mr. Ronald T. Eguchi is President and CEO of ImageCat, Inc., a risk management company specializing in the development and use of advanced technologies for risk assessment and reduction. Mr. Eguchi has over 30 years of experience in risk analysis and risk management studies. He currently serves on several editorial boards including EERI's Journal *SPECTRA*. In 1997, he was awarded the ASCE C. Martin Duke Award for his contributions to the area of lifeline earthquake engineering. In 2006, he accepted an ATC Award of Excellence on behalf of the ATC-61 project team for work on *An Independent Study to Assess Future Savings from Mitigation Activities* that showed that a dollar spent on hazard mitigation saves the nation about $4 in future benefits. He was recognized by EERI as the 2008 Distinguished Lecturer. He currently chairs the Technical Committee on Advanced Technologies for the SEI Division of ASCE.

SUPPLEMENTAL ACTIVITES

Tour of Geotechnical Laboratory

The purpose of this tour was to provide an introduction between Mr. Eguchi and Dr. Jie Han, an ASCE fellow, and KU professor. Dr. Jie Han has an extensive background in geotechnical engineering. Mr. Eguchi joined Dr. Jie Han for a tour of the geotechnical laboratory. The tour consisted of viewing several types of webbing and synthetic fabric which are utilized in stabilizing soil beds near abutments and other structures. Dr. Jie Han showed Mr. Eguchi a type of composite pipe which is crush resistant yet flexible, with a much higher corrosion resistance than standard corrugated metal pipes. Mr. Eguchi toured a test bed currently being used to research vegetation growth useful for transportation related projects.

Figure 1. Mr. Eguchi and Dr. Jie Han observing a composite culvert material.

Tour of Structural Research Labs

The purpose of these tours was to demonstrate the capabilities of the University of Kansas' structural research labs in the fields of concrete bond strength and steel fatigue and fracture. During the course of the tour Donald Spradling, who is a structural engineering researcher, presented to Mr. Eguchi the various projects which were underway at the Structural Research Facility. The tour focused on the construction and testing of reinforced concrete beams, headed reinforcement bars, and high strength concrete. The tour moved across campus where Kathleen McElrath demonstrated the method by which bridge components are tested for fatigue weaknesses. The project demonstrated by Kathleen showed a fundamental problem in bridge construction and the method by which a retrofit could be tested to evaluate it efficacy.

Tour of Kansas Applied Remote Sensing Center

The purpose of this tour was to introduce Mr. Eguchi to the project leader of the KARS program, Mr. Kevin Dobbs. The tour was largely a boardroom discussion between Mr Eguchi, Mr. Dobbs, and members from the KARS team. The conversation centered on the method by which the geospatial community is organized and the rapid response during times of crisis. Mr. Dobbs outlined the current projects of KARS and demonstrated the capabilities of flood prediction and analysis software his cell was continuing to develop.

RESULTS, FEEDBACK AND LESSONS LEARNED

Brief description of challenges during the process, general reception of the program and Visiting Professional. Also a description of other topics or disciplines the Student Chapter would like to cover in future visits, and related goals.

- The general reception of Mr. Eguchi was excellent. Both faculty and students were interested in his presentation.
- Our students were especially impressed with the opportunity to speak with him during the tours. In future visits we will maximize the amount of students who will interact with a visiting professional directly.
- This program was highly beneficial in increasing the stature of our student chapter. We were able to network contacts from many professional groups on campus from this event.

Figure 2. Mr. Eguchi and Dinner party guests.

ACKNOWLEDGEMENTS

The University of Kansas EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel of Mr. Ronald T. Eguchi through their Friedman Family Visiting Professional Program endowment.

LIST OF ATTACHMENTS

Included at the end of this report are various attachments to supplement the information included above. A list of the attachments is included below:

- Item 1, flier for event

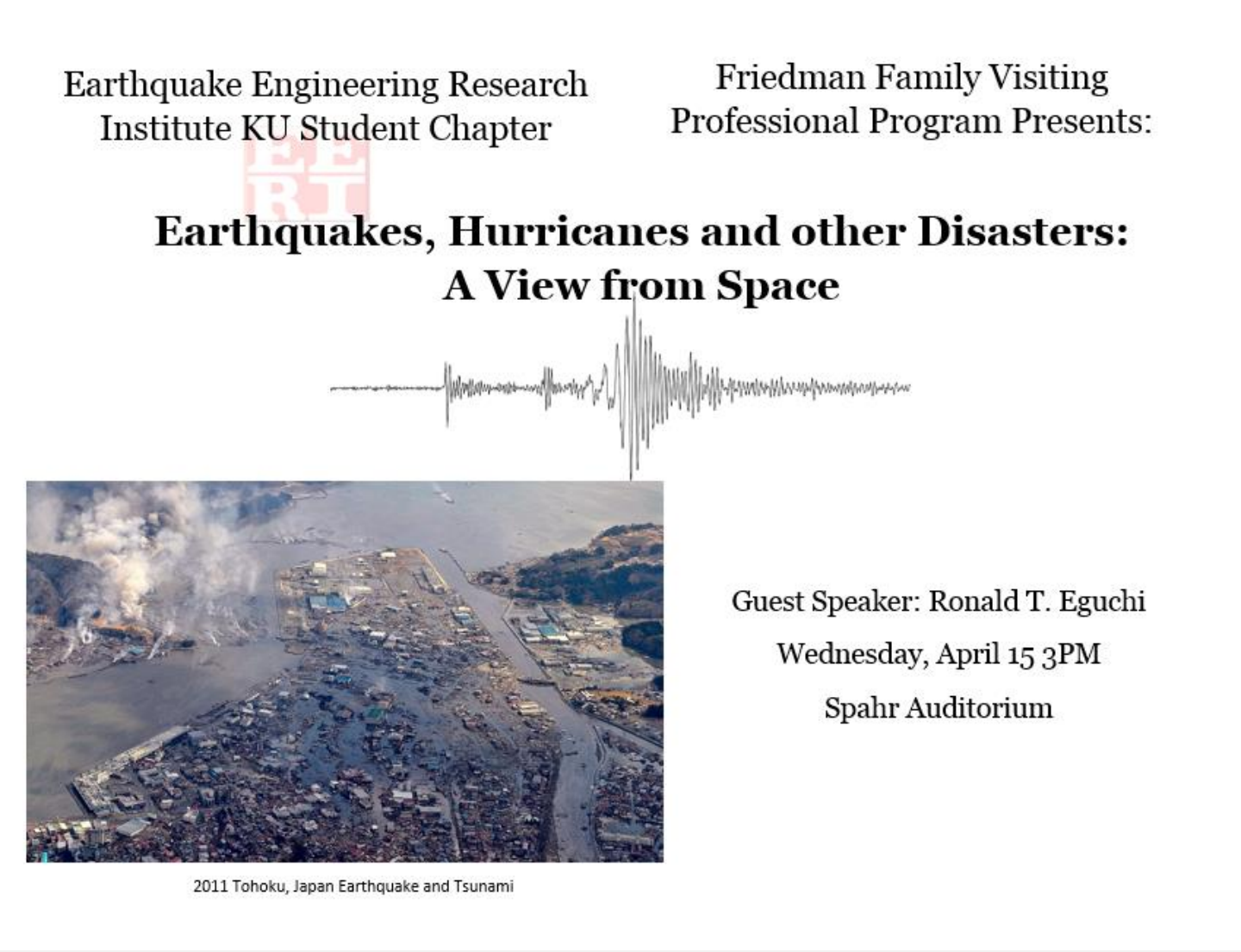

Figure 3. Flier posted on campus and emailed campus wide just before event.