

;30 AFRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM



Visit to University of Minnesota: March 15, 2024

This report summarizes the visit of **Mr. Ronald Eguchi** from ImageCat that took place at the University of Minnesota on March 15, 2024.

ITINERARY OR AGENDA

March 14 th	
TIME:	ACTIVITY:
5:00 PM	Airport Pick up by Professor Pedram Mortazavi
March 25 th	
TIME:	ACTIVITY:
08:00 – 08:50 am	Breakfast at Beacon Restaurant, Pedram Mortazavi
09:00 – 09:30 am	Meeting with Catherine French
09:30 – 10:00 am	Tour of the Galambos Lab
10:00 – 10:30 am	Meeting with Ketson Dos Santos
10:30 – 11:00 am	Meeting with Lauren Linderman
11:00 – 11:30 am	Meeting with Ben Worsfold
11:30 – 12:00 am	Meeting with Jiliang Le
12:00 – 01:00 pm	Lunch (Location TBD)
01:00 – 02:00 pm	Friedman Family Visiting Professional Lecture
02:00 – 03:00 pm	Meeting with Graduate Students
03:00 – 03:30 pm	Meeting with Qizhi He
03:30 – 04:30 pm	Tour of the MAST Lab
04:30 pm	Leave for the Airport with Pedram Mortazavi

STUDENT CHAPTER VISIT PLANNING COMMITTEE

- Mohammad Amin Dargi, President, dargi019@umn.edu
- Professor Pedram Mortazavi, Faculty Advisor, pmortaza@umn.edu
- Professor Catherine French, Former Faculty Advisor, cfrench@umn.edu

VISITING PROFESSIONAL LECTURE OVERVIEW

The title of the lecture was “Seismic Risk Evaluation of Water Supply Systems”. Mr. Eguchi provided an overview of his extensive expertise and long career in risk evaluation and mitigation for water lifelines.

The lecture was well attended by graduate students, faculty members and industry professionals. Professors Dos Santos, Worsfold, Mortazavi, Linderman, and French attended the lecture. Professor Qizhi He attended the talk remotely. The pictures below were taken during the lecture.

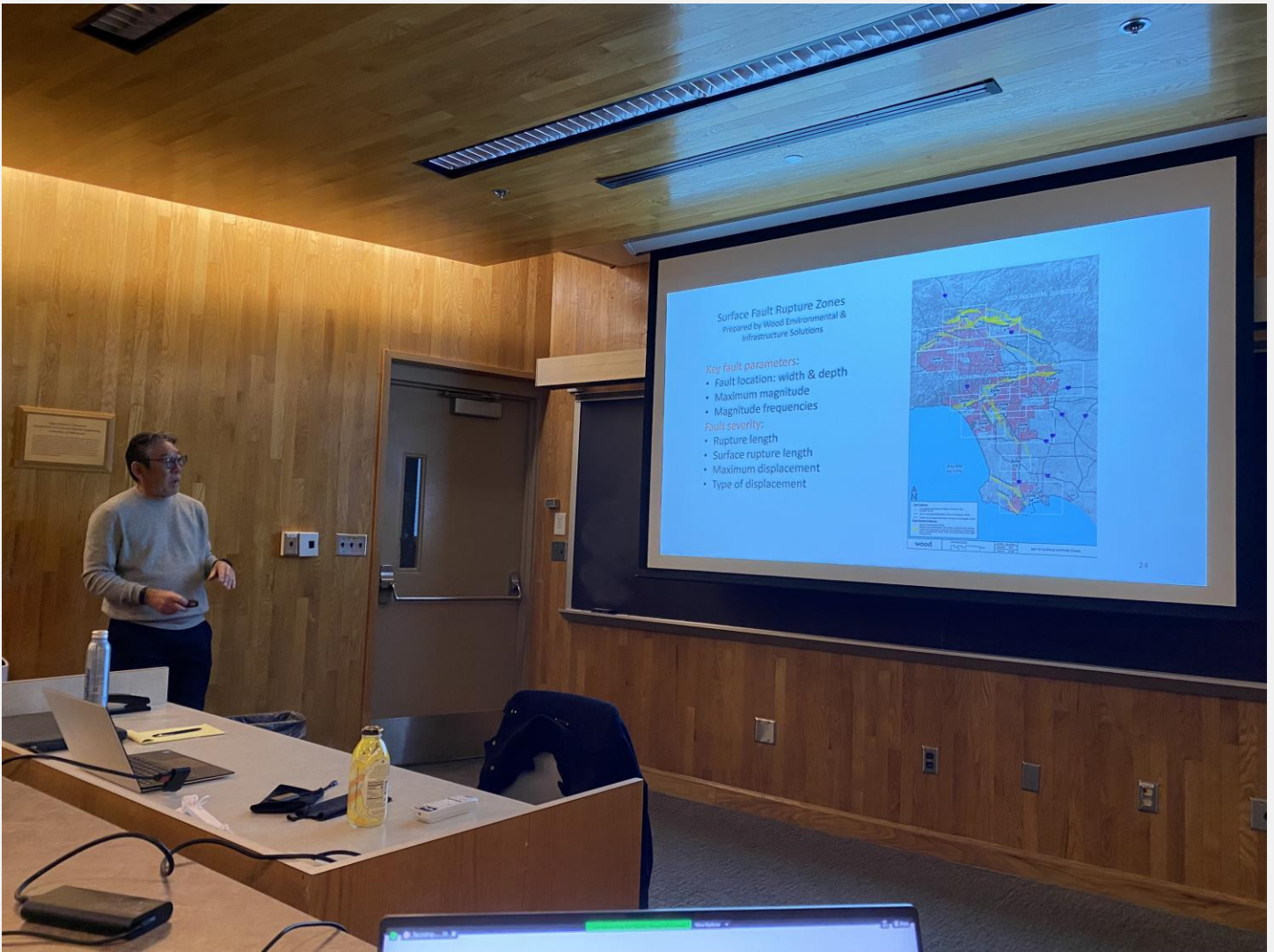


Figure 1: A picture of the Lecture by Mr. Ronald Eguchi at the university of Minnesota

Lecture Abstract

A seismically-resilient water lifeline system is critical for ensuring effective post-event response and rapid community recovery after disastrous earthquakes. To design, construct, and maintain seismically-resilient water systems, it is crucial that the damage potential of a pipeline system be quantified in future earthquakes. Mitigation strategies to address known vulnerabilities are essential in ensuring that system performance goals and criteria can be achieved with available resources. To assess the damage potential of a large water pipeline network, the following factors must be addressed: regional seismicity, spatial distribution of earthquake-induced shaking, and ground deformation (event footprint) in future events, pipeline fragilities, and agency resources for emergency response. In this study, a large stochastic catalog of earthquake simulations, or an “event set,” that adapts the Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3) model is developed to represent the regional seismicity of the Los Angeles Basin. Random event footprints for each earthquake simulation are constructed by utilizing empirical ground motion models (GMMs) that are consistent with the 2014 United States Geological Survey (USGS)’s National Seismic Hazard Mapping Project (NSHMP). This set of earthquake simulations captures the large uncertainties in seismic hazard models than simplified methods and is utilized to evaluate system-level consequences for the entire City of Los Angeles water pipeline network, measured by the total number of pipeline repairs and subsequent repair costs and times due to strong ground shaking and ground deformations. These estimates of damage and impact are based on empirical pipeline

fragility models and restoration data from two past events that affected the water system in the past (1971 San Fernando and 1994 Northridge Earthquakes). System-level performance is then evaluated at various targeted probability levels and influential seismic sources are identified. This study was performed as part of a long-term program administered by the City of Los Angeles Department of Water and Power to quantify and ultimately enhance the seismic resilience of all city trunklines and distribution pipelines.

Professional Bio

Mr. Eguchi is the President and CEO of ImageCat, Inc., an international risk management company that supports the global risk and catastrophe management needs of the insurance industry, governments and NGOs. Mr. Eguchi has over 30 years of experience in risk analysis and risk reduction studies. He currently serves or has served 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 where he discussed the topic of "Earthquakes, Hurricanes, and other Disasters: A View from Space." In 2015, he founded the Technical Committee on Advances in Information Technologies for the SEI Division of ASCE. He was awarded the 2017 Civil & Environmental Engineering Department Distinguished Alumnus Award from UCLA. In 2023, he was appointed to the California Governor's Advisory Board on Wildfire Technology Research & Development, and in 2024, he was appointed as the Founding Chair of the National Institute of Building Sciences (NIBS) Lifeline Advisory Panel. He has authored over 300 publications, many of them dealing with the seismic risk of utility lifeline systems and the use of remote sensing technologies for disaster response.

SUPPLEMENTAL ACTIVITIES

Meetings with Faculty Members

During Mr. Eguchi visit, several one-on-one meetings were organized with structural faculty members within the department of Civil, Environmental, and Geo- Engineering (CEGE) at the University of Minnesota. These meetings led to fruitful discussions regarding research and potential collaboration.

Tour of the Galambos Lab

In the morning of March 15th before the FFVP lecture, a tour of the Galambos structural testing laboratory was given to Mr. Eguchi. The tour was led by Professor Catherine French, the former director of the laboratory. During the tour, the testing capabilities of the Galambos lab were outlined along with the history behind the development of the lab. The picture below was taken during the tour of the Galambos laboratory.

University of Minnesota Campus Tour

A separate tour of the University of Minnesota Campus was provided to Mr. Ronald Eguchi by professor Pedram Mortazavi on March 15th, after lunch. In addition, a more detailed tour of the CEGE building was provided.

Meeting with Graduate Students

Towards the end of the day, several graduate students met with Mr. Ronald Eguchi. In their meeting, graduate students discussed their research projects with Mr. Eguchi and got valuable feedback on their research. In addition, they explained their short-term and long-term career goals, on which they received valuable guidance and feedback from Mr. Eguchi.



Figure 2: A picture taken during the tour of the Galambos laboratory (from left to right: Professor Catherine French, Mr. Ronald Eguchi)

Tour of the MAST Lab

Mr. Ronald Eguchi's visit was concluded with a visit to the Multi-Axial Subassemblage Testing (MAST) laboratory. The tour was led by Professor Catherine French (former director of the MAST lab) and was attended by Professor Pedram Mortazavi. The tour included outlining the testing capabilities at the MAST lab, providing an overview of past projects, and visions for future research at the MAST. The following picture was taken at the MAST lab after the tour.

RESULTS, FEEDBACK AND LESSONS LEARNED

The lecture by Mr. Ronald Eguchi attracted a large audience from undergraduate students, graduate students, UMN alumni, Industry professionals, and faculty members.

Mr. Eguchi's lecture provided a great opportunity for the University of Minnesota structural engineering community to learn more about current earthquake engineering practices and risk mitigation in the west coast. In addition, it piqued the interest of undergraduate and graduate students to get involved not just in earthquake engineering research, but also with the EERI student chapter.

The graduate students had the unique opportunity to discuss their research projects with Mr. Ronald Eguchi and receive valuable feedback from him. Further, Mr. Ronald Eguchi provided the Chapter members and graduate students with valuable career advice.



Figure 3: A picture taken during the tour of the MAST laboratory (from left to right: Professor Pedram Mortazavi, Mr. Ronald Eguchi, and Professor Catherine French)

ACKNOWLEDGEMENTS

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

LIST OF ATTACHMENTS

A list of the attachments is included below:

- Item 1, flier for event



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EERI Friedman Family Visiting Professional Lecture

University of Minnesota Earthquake Engineering Research Institute Student Chapter

Seismic Risk Evaluation of Water Supply Systems

RONALD T. EGUCHI

President & CEO, ImageCat

www.imagecatinc.com

Abstract

A seismically-resilient water lifeline system is critical for ensuring effective post-event response and rapid community recovery after disastrous earthquakes. To design, construct, and maintain seismically-resilient water systems, it is crucial that the damage potential of a pipeline system be quantified in future earthquakes. Mitigation strategies to address known vulnerabilities are essential in ensuring that system performance goals and criteria can be achieved with available resources. To assess the damage potential of a large water pipeline network, the following factors must be addressed: regional seismicity, spatial distribution of earthquake-induced shaking, and ground deformation (event footprint) in future events, pipeline fragilities, and agency resources for emergency response. In this study, a large stochastic catalog of earthquake simulations, or an “event set,” that adapts the Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3) model is developed to represent the regional seismicity of the Los Angeles Basin. Random event footprints for each earthquake simulation are constructed by utilizing empirical ground motion models (GMMs) that are consistent with the 2014 United States Geological Survey (USGS)’s National Seismic Hazard Mapping Project (NSHMP). This set of earthquake simulations captures the large uncertainties in seismic hazard models than simplified methods and is utilized to evaluate system-level consequences for the entire City of Los Angeles water pipeline network, measured by the total number of pipeline repairs and subsequent repair costs and times due to strong ground shaking and ground deformations. These estimates of damage and impact are based on empirical pipeline fragility models and restoration data from two past events that affected the water system in the past (1971 San Fernando and 1994 Northridge Earthquakes). System-level performance is then evaluated at various targeted probability levels and influential seismic sources are identified. This study was performed as part of a long-term program administered by the City of Los Angeles Department of Water and Power to quantify and ultimately enhance the seismic resilience of all city trunklines and distribution pipelines.



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University of Minnesota Earthquake Engineering Research Institute Student Chapter

About the Speaker



Mr. Eguchi is the President and CEO of ImageCat, Inc., an international risk management company that supports the global risk and catastrophe management needs of the insurance industry, governments and NGOs. Mr. Eguchi has over 30 years of experience in risk analysis and risk reduction studies. He currently serves or has served 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

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Date and Time: March 15th, 1 pm - 2 pm

Location: Room 205, Civil Engineering Building, University of Minnesota

Zoom Link: click [here](#)

Meeting ID: 787 826 9163

Passcode: FFVP2024

For additional information, you may contact Professor Pedram Mortazavi at pmortaza@umn.edu.