

FRIEDMAN FAMILY VISITING PROFFESIONALS PROGRAM

Visit to Cal Poly SLO: April 27-28th, 2023



CAL POLY



This report summarizes the visit of **Ronald Eguchi** from ImageCat that took place at California Polytechnic State University, San Luis Obispo on April 27-28th, 2023.

ITINERARY OR AGENDA

Thursday, April 27, 2023	
TIME:	ACTIVITY:
6:00 PM – 8:00 PM	Dinner with EERI Board and Faculty
Friday, April 28 th , 2023	
9:00 AM – 11:30 AM	Tour High Bay Lab, Seismic Lab, Digital Fabrication Lab, Wood Shop and Metal Shop with EERI Board; meet with project/research graduate and undergraduate students
12:00 PM – 1:00 PM	Guest lecture by Visiting Professional
1:10 PM – 2:30 PM	Graduate student project/research presentations
2:30 PM – 3:00 PM	Meet with Al Estes, Department Head of Cal Poly Architectural Engineering program
3:00 PM – 4:00 PM	Tour Design Village event at Poly Canyon Architectural/Structural Experimental Facility

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

- Tom Sesin, EERI Student Chapter Co-President, tsesin@calpoly.edu
- Dalton Muck, EERI Student Chapter Co-President, dmuck@calpoly.edu
- Payton Filippin, EERI Student Chapter Co-President, pfilippi@calpoly.edu
- Anahid Behrouzi, EERI Student Chapter Faculty Advisor, behrouzi@calpoly.edu

VISITING PROFESSIONAL LECTURE OVERVIEW

Lecture Abstract – “Seismic Risk Evaluation of Water Supply Systems”

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 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 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. He was awarded the 2017 Civil & Environmental Engineering Department Distinguished Alumnus Award from UCLA.

SUPPLEMENTAL ACTIVITIES

Dinner with Mr. Eguchi

Eight members of the Cal Poly EERI Student Chapter, the Cal Poly EERI Student Chapter faculty advisor, and the Architectural Engineering (ARCE) Department Head went to dinner with Mr. Eguchi. Mr. Eguchi was introduced to the ARCE program and culture and learned more about the department. He provided insight into his background as well as his current professional activities.

Tour of CAED Facilities

Six members of the Cal Poly EERI Student Chapter showed Mr. Eguchi the various facilities that the Cal Poly College of Architecture and Environmental Design (CAED) offers, including the High Bay Lab, Seismic Lab, Digital Fabrication Lab, Wood Shop and Metal Shop. Students were present in each lab to discuss their undergraduate or graduate research that utilized that respective lab space. Mr. Eguchi was also able to observe an experiment performed by an undergraduate design lab class outside the High Bay Lab. Student research projects included:

- Seismic damping for EERI SDC model
- Timber shear wall strap capacity testing
- Steel-framed satellite dish design
- Various individual projects in the Digital Fabrication Lab and Wood/Metal Shops

Graduate Student Presentations

After Mr. Eguchi's lecture, seven graduate students presented their current thesis work or projects and listened to feedback from Mr. Eguchi. The topics included:

- Creating supplemental course material for Timber Design lecture class
- Implementing accelerometers in tilt-up concrete structure for seismic analysis
- Spatial form finding as a design tool to unite architecture and engineering
- Architecture digital fabrication course project
- Corrosion analysis of steel using digital imaging
- Sustainable materials used in the concrete manufacturing process

Meeting with the Department Head of the Architectural Engineering Program

Mr. Eguchi had a discussion with the Department Head of the Architectural Engineering Program, Al Estes. They discussed the state of the department and its continuing mission to prepare graduates for industry through close connections with industry leaders.

Design Village at Poly Canyon Architectural/Structural Experimental Facility

Mr. Eguchi and two students toured the Poly Canyon Architectural/Structural Experimental Facility, the home of twenty-six student designed and built structured dating back to 1964. At the time of Mr. Eguchi's visit, Poly Canyon was also hosting Design Village, an annual architecture competition where competitors design and build "shelters" in which they inhabit throughout the entirety of the weekend. This experience allowed Mr. Eguchi to experience a unique tradition and truly absorb Cal Poly's "Learn-By-Doing" philosophy.

RESULTS, FEEDBACK AND LESSONS LEARNED

Results/Feedback:

- Ronald Eguchi's **unique approach to seismic engineering** allowed students and faculty to gain a new perspective on managing the risk of lifeline performance during earthquakes and its importance.
- Ronald stressed the **importance of collaboration** between different disciplines of engineering to best work together towards a common goal of life safety. Having an open discourse on the strategies to being seismically resilient can prove to be very beneficial in the long run.
- **Insights into Ronald's career path** were of interest to students who are just beginning their own career paths.

Lessons Learned:

- **Involve more faculty.** Only a few faculty members were able to meet Ronald, and it is always great for faculty to share their course content and its relevance to the industry that Ronald is a part of.
- **Encourage underclassman participation.** Not many underclassmen were present for the lecture, though they would have benefitted greatly from it. Moving forward, it is important to make sure underclassmen feel comfortable to attend these activities.
- **Notify faculty administrators of visitors' arrival early.** Deans and other faculty administrators often like to meet with the visiting professional, but usually have very busy schedules. Notify these faculty members early to ensure they can find the time to meet with the visitor.

ACKNOWLEDGEMENTS

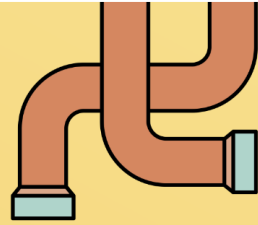
The Cal Poly SLO EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel of Ronald Eguchi through their Friedman Family Visiting Professional Program endowment. They would also like to thank the ARCE department for funding the student/faculty dinner with Ronald Eguchi.

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
- Item 2, Picture of Dinner with Ronald Eguchi
- Item 3, Pictures of Ronald Eguchi's Lecture and Student Presentations
- Item 4, Picture of Tour of Design Village in Poly Canyon

SEISMIC RISK EVALUATION OF WATER SUPPLY SYSTEMS



Ronald Eguchi

An EERI Friedman Family
Visiting Professionals Lecture

BERG GALLERY (BLDG. 5-105)

FRIDAY, APRIL 28TH

12-1PM

FOOD PROVIDED



PLEASE FILL OUT
INTEREST FORM!!!



Cal Poly's EERI Chapter is hosting Mr. Ronald Eguchi, President and CEO of ImageCat, Inc., an international risk management company that supports catastrophe management for governments and large industries. Mr. Eguchi is giving a lecture about seismic risk evaluation of water supply systems and how their performance is crucial during earthquakes. Please join us!

Item 2



Item 3



Item 4

