FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM

Visit to Virginia Tech: April 24, 2025

This report summarizes the visit of **Mr. Ronald T. Eguchi** from ImageCat, Inc. that took place at the Virginia Polytechnic Institute and State University, commonly referred to as Virginia Tech (VT), on April 24, 2025.

ITINERARY OR AGENDA

TIME:	ACTIVITY:
8:00 AM – 9:00 AM	Breakfast with VT's EERI officers and Dr. Roberto León at the Inn at Virginia Tech.
9:00 AM – 9:30 AM	Meeting with Dr. Matthew R. Eatherton (Patton Hall, Room 105-A).
9:45 AM – 10:15 AM	Meeting with Prof. Adrian Rodríguez-Marek (Patton Hall, Room 120-C).
10:30 AM – 11:00 AM	Meeting with Prof. Monica Arul Jayachandran (Patton Hall, Room 102-B).
11:00 PM – 12:00 PM	Campus tour (Torgersen Hall, Drillfield, Construction Lab, etcetera).
12:30 PM – 12:45 PM	Lunch: Mellow Mushroom (Litton Reaves Hall, Room 1860).
12:45 PM – 1:45 PM	Friedman Family Lecture (Litton Reaves Hall, Room 1860).
2:15 PM – 3:45 PM	English Geotechnical Lab and Structural Lab tours.
4:00 PM – 5:00 PM	Student meeting (Patton Hall, Ozawa Library).
6:30 PM – 8:00 PM	Dinner with VT's EERI officers, Dr. Rodríguez-Marek and Dr. Roberto León at The Farmhouse.

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

- Saad Allah Solh, **President**, saadallahsolh@vt.edu
- Sepehr Akhtarshenas, **Vice President**, spakhtarshenas@vt.edu
- Héctor R. Montilla-Peña, **Outreach Chair**, hectormontilla@vt.edu
- Sanish Bhochhibhoya, **Treasurer**, sbhochhi@vt.edu
- Dr. Roberto León, **Faculty Advisor**, rleon@vt.edu

VISITING PROFESSIONAL LECTURE OVERVIEW

Mr. Ronald T. Eguchi delivered a lecture entitled *Seismic Risk Evaluation of Water Supply Systems*. He walked the audience through a stochastic catalog of southern-California earthquakes, pipeline fragility functions, and restoration-time models that his team uses to forecast the number of repairs, cost, and downtime for Los Angeles' 7,000-km water-distribution network. The case study illustrated how data-driven risk assessments can pinpoint the most cost-effective retrofit priorities and, ultimately, raise a city's overall lifeline resilience.

The talk drew more than 35 students and faculty members, filling Litton Reaves Hall, Room 1860 (*see figure below*). Attendees stayed well past the scheduled end for a lively 15-minute Q&A on modeling assumptions, funding hurdles, and career advice. Informal feedback and a follow-up LinkedIn post praised the lecture as "inspiring" and noted the privilege of witnessing what may be Mr. Eguchi's final Friedman-program appearance after many years of service to the earthquake-engineering community.

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 potential damage 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 the study that will be discussed, 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 USGS's National Seismic Hazard Mapping Project (NSHMP). This set of earthquake simulations captures the large uncertainties in seismic hazard models 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 critical 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 40 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. In 2024, he was awarded the ASCE LeVal Lund Practice Award for Lifeline Risk Reduction. 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.

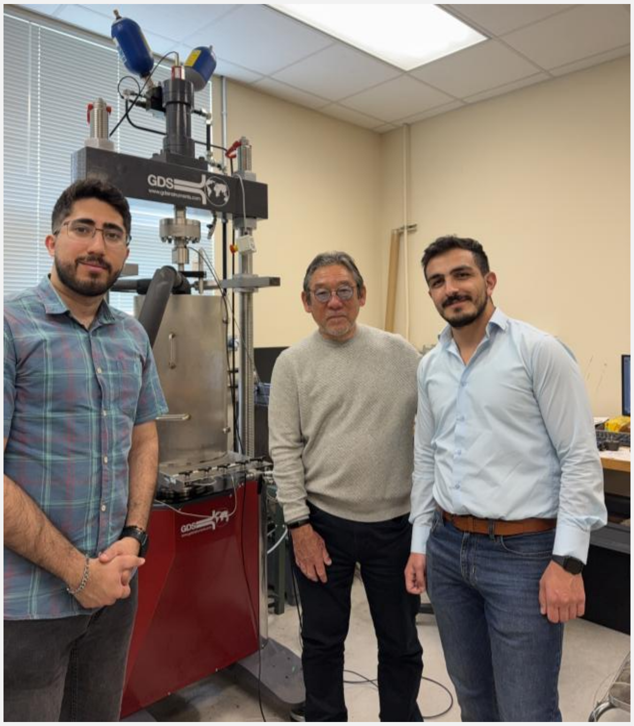
SUPPLEMENTAL ACTIVITES

Campus Tour

To help Mr. Ronald T. Eguchi experience Virginia Tech's ecosystem, we arranged a guided campus tour. Joining him were VT's EERI officers. The group began at Torgersen Hall.

English Geotechnical Lab & Structural Lab Tours

The visit continued with technical tours of the English Geotechnical Laboratory and the Structural Engineering Laboratory. Graduate students, Mr. Eguchi, and VT's EERI officers attended (*see figure below*).



Student Meeting

We closed the day with an informal student roundtable in the Ozawa Library. Mr. Eguchi met with active VT's EERI members and VT's EERI officers. He offered career advice on seismic-risk consulting, shared field stories, and underscored the importance of community resilience and client communication. Students asked about EERI, ImageCat, and coursework recommendations.

RESULTS, FEEDBACK AND LESSONS LEARNED

There were no major hurdles during the planning and/or execution of the visit, only the usual logistical details of reserving rooms, arranging A/V support, and coordinating Mr. Eguchi's campus movements to keep the program running on schedule. Although we did not administer a formal satisfaction survey, the spontaneous feedback shared by students after the lecture made it clear that they found the presentation highly engaging and rewarding.

- Performance-based seismic design for masonry and low-rise housing in emerging economies.
    - Goal is to equip members working on service projects in emerging economies with design guidelines and retrofit strategies.
- Climate-adapted infrastructure resilience.
    - Goal is to invite experts on cascading hazards (e.g., compound flooding and seismic events).

ACKNOWLEDGEMENTS

The Virginia Tech's 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.

Additionally, we gratefully acknowledge the generous support of the Charles E. Via, Jr. Department of Civil & Environmental Engineering (CEE) at Virginia Tech, who's extra $600 in funding helped cover food, materials, and other event-related expenses for our Friedman Family Visiting Professional activities.

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 – **Flyer For Event**

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