

# FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM

## Visit to Portland State University: April 25, 2019



This report summarizes the visit of **Dr. Faiz Makdisi** from SAGE Engineers of Gannett Fleming that took place at the Portland State University on April 25, 2019.

### ITINERARY OR AGENDA

Provide the itinerary of the visit. For example:

TIME:	ACTIVITY:
10:00 AM – 10:30 AM	Meeting with EERI chapter leadership
10:30 AM – 11:30 AM	Career and research discussion with EERI leaders and department graduate students
11:30 AM – 12:00 PM	Tour of geotechnical labs
12:00 PM – 12:45 PM	Lunch with EERI students
1:00 PM – 2:00 PM	Lecture by Dr. Makdisi
2:00 PM – 3:00 PM	Tour of campus and iSTAR lab (infrastructure Testing and Applied Research Laboratory)

### STUDENT CHAPTER VISIT PLANNING COMMITTEE

**LEAD ORGANIZER(S):** Andrew Huffman, Seminar Coordinator, [andr4@pdx.edu](mailto:andr4@pdx.edu)

- Melissa Preciado, President, [prec@pdx.edu](mailto:prec@pdx.edu)
- Evgeny Kozyaev, SDC Captain, [evgeny@pdx.edu](mailto:evgeny@pdx.edu)
- Sepehr Nadalizadeh, Chapter Member, [snadal2@pdx.edu](mailto:snadal2@pdx.edu)
- Dr. Arash Khosravifar, Faculty Adviser, [karash@pdx.edu](mailto:karash@pdx.edu)

### VISITING PROFESSIONAL LECTURE OVERVIEW

Dr. Makdisi gave an informative presentation on analyzing seismic stability and deformation of embankment dams, including an overview of state-of-practice methods and case study illustrations. For the lecture, we had around 80 attendees consisting of, undergraduate and graduate students, department faculty, and local professionals from private firms and government agencies. Overall, the response was very positive from attendees of all backgrounds.



Figure 1: Lecture by Dr. Makdisi



Figure 2: Geotechnical graduate program with Dr. Makdisi

## Lecture Abstract

The presentation will describe the effects of earthquakes on dams, and the state-of-practice for evaluating the seismic stability and earthquake-induced deformations of embankments and slopes. Methods for evaluating the stability of slopes and embankments during earthquakes have evolved from estimating factors of safety while applying to the slope a horizontal inertial force (termed the pseudo-static seismic coefficient), to estimating deformations using Newmark's concept of yield acceleration and sliding block analyses, to detailed two-dimensional dynamic response analyses using equivalent linear approaches, and more recently, to evaluating deformations using fully-coupled nonlinear response and deformation analyses.

The presentation will describe procedures and examples from current practice for: a) estimating earthquake ground motions at a dam site; b) estimating the dynamic response and earthquake-induced accelerations within an embankment; c) estimating post earthquake factors of safety and yield accelerations using limit equilibrium slope stability analysis; and c) estimating earthquake-induced deformations. Simplified methods as well as detailed equivalent linear analyses, and recently developed nonlinear analyses will be described. Case histories of seismic retrofits of embankment dams will also be presented.

## Professional Bio

Faiz I. Makdisi is a Senior Principal Engineer with SAGE Engineers (a Business Group of Gannett Fleming) in Oakland, California. He received his Bachelor of Engineering degree from the American University of Beirut, Lebanon, and his M.Sc. and Ph.D. degrees in Geotechnical Engineering from the University of California at Berkeley. He has over 39 years of specialized experience in geotechnical and earthquake engineering. Dr. Makdisi has been actively involved in studies of the seismic behavior of earth and rock fill dams and embankments. He developed and published (with the late Professor H. Bolton Seed) widely used simplified procedures for estimating the dynamic response and permanent deformations in earth and rock fill dams. Recently, Dr. Makdisi has been involved in development of seismic design criteria, evaluation of seismic stability, and design of alternative remedial measures for more than 25 embankment dams.

He has authored and co-authored many papers dealing with the seismic stability of dams and with various aspects of earthquake ground motions and seismic design criteria for critical facilities. He is a recipient of the 1977 Norman Medal award of the American Society of Civil Engineers (ASCE) for the paper (co-authored with Seed, Lee and Idriss) on the analyses of the slides in the San Fernando Dams during the 1971 San Fernando earthquake. As a member of a team of Technical Advisors to the Los Angeles District, Corps of Engineers, on the design and construction of Seven Oaks Dam in California, Dr. Makdisi was a co-recipient of the U.S. Army Corps of Engineers, Chief of Engineers "Design and Environmental Honor Award for 2002." In 2017, Dr. Makdisi was awarded the Danny K. McCook Medal by Association of State Dam Safety Officials (ASDSO), for his lasting contributions to dam safety.

## SUPPLEMENTAL ACTIVITIES

### Meeting with EERI chapter leadership

Upon his arrival, our EERI chapter leaders met with Dr. Makdisi. We discussed our chapter's activities from the past year, including community outreach events to raise awareness regarding seismic resilience and our SDC team's performance. Dr. Makdisi offered some suggestions and encouragement for our chapter going forward. He was engaging and interested in each of the students.

### Career and research discussion

Several of our geotechnical engineering graduate students gave brief presentations of their research efforts. Dr. Makdisi offered helpful feedback. This session transitioned into a time of very valuable career advice from Dr. Makdisi. He gave advice and answered questions from his vast experience and knowledge of the

geotechnical field. This open discussion was one of the highlights of our time with Dr. Makdisi. He shared advice and expertise openly and was very encouraging to all of us.

## 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 visiting professional process went very smoothly, and we did not experience any difficulties working with Dr. Makdisi.
- Both the lecture and other interactions with Dr. Makdisi were received very well. His lecture served as a valuable promotion of our EERI chapter. This helped us gain new members and leaders for next year. The lecture garnered significant interest from our local professional community and helped to strengthen our EERI chapter's relationship with that community. Our EERI leaders and graduate students were very appreciative of the valuable advice and experience that Dr. Makdisi shared. This was a wonderful opportunity for all of us.
- In the past three years we have been fortunate to have three lecturers as part of the Friedman Family Visiting Professional program covering topics including seismology, resiliency, and geotechnical engineering. We would like to expand the breadth of topics in future visits to include structural engineering as well.

## ACKNOWLEDGEMENTS

The Portland State University EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel of Dr. Faiz Makdisi through their Friedman Family Visiting Professional Program endowment.

The Portland State University EERI Student Chapter also gratefully acknowledges the support of the Portland State University Civil Engineering Department for their funding of our student chapter, which covered our expenses for the events during Dr. Makdisi's visit.

## LIST OF ATTACHMENTS

Included at the end of this report is a flyer for Dr. Makdisi's lecture to supplement the information included above.



**Thursday, April 25, 2019. 1:00 p.m. - 2:00 p.m.**  
**CIN 90 (in 5<sup>th</sup> Avenue Cinema). 510 SW Hall Portland OR, 97201**

CEE Infrastructure Seminar Series:  
EERI (Earthquake Engineering Research Institute) Student Chapter at PSU Presents:  
Friedman Family Professional Lecture

Guest Speaker: **Faiz I. Makdisi, PhD, PE, D.GE**

**“Seismic Stability and Deformation of Embankment Dams”**

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## Abstract

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## Biography

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To RSVP for this event, please utilize the following link:

[https://docs.google.com/forms/d/e/1FAIpQLSdPObpQOMS2cAtg3K2r8CMuHGgXh7kQkhy4ACyzCGcjW1KWPA/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSdPObpQOMS2cAtg3K2r8CMuHGgXh7kQkhy4ACyzCGcjW1KWPA/viewform?usp=sf_link)