FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM

IOWA STATE UNIVERSITY

Visit to Iowa State University: April 14, 2017

This report summarizes the visit of Dr. Faiz Makdisi from Sage Engineering, INC that took place at Iowa State University on April 14th, 2017

ITINERARY OR AGENDA

TIME:	ACTIVITY:
8:00 AM – 9:00 AM	Student Chapter President meets Dr. Makdisi and gives tour of civil engineering building and structures lab
9:00 AM – 9:30 AM	Dr. Makdisi meets with Dr. Sri Sritharan
9:30 AM – 10:00 AM	Dr. Makdisi meets with Dr. In Ho Cho
10:00 AM – 10:45 AM	Student Chapter meets and gives presentation to Visiting Professional
11:00 AM – 12:00 PM	Guest lecture by Dr. Makdisi
12:00 PM – 1:00 PM	Lunch
1:15 PM – 2:00 PM	Dr. Makdisi meets chapter advisor and gets tour of geotechnical/materials lab
2:00 PM – 2:45 PM	Chapter president gives Dr. Makdisi tour of Iowa State campus

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S): {enter name of student members who lead the visit, chapter role, email}

- Jacob Eull, Chapter President, jeull@iastate.edu
- Phuong Vo, USDC captain, phvo@iastate.edu
- Nicole Johnson, treasurer, nmjohns@iastate.edu
- Dr. Jeramy Ashlock, Chapter advisor, jashlock@iastate.edu

VISITING PROFESSIONAL LECTURE OVERVIEW

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 of 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 dam sites; 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, Inc. 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."

Dr. Makdisi has taught short courses on the seismic stability of dams at the 2008 Geotechnical Earthquake Engineering and Soil Dynamics Conference in Sacramento, CA, and at the 2013 International Committee on Large Dams Conference in Seattle, WA. He has presented lectures at ASCE seminars and workshops in San Francisco, Los Angeles, and Oakland, California, and Seattle, Washington; as well as lectures at the University of California campuses at Berkeley and Davis, at Stanford University, the University of Illinois at Urbana-Champaign, the University of Puerto Rico at Mayaguez, and at Virginia Tech. He was invited to present a keynote lecture on the seismic stability of embankments and slopes at the session on slope stability at the Geo-Denver 2000 conference of ASCE's Geo-Institute. He also presented a lecture on seismic design criteria for dams at the Federal Energy Regulatory Commission's (FERC) Dam Safety Workshop, held in Portland, Oregon in March of 2001. Dr. Makdisi is a member of the Earthquake Engineering Research Institute (EERI), and the Earthquake Committee of the United States Society on Dams (USSD), and serves on the ASCE 1 Committee involved in updating the "Standard for Geotechnical Analysis, Design, Construction, Inspection and Monitoring of Nuclear Safety-Related Structures.'

SUPPLEMENTAL ACTIVITES

Tour of Civil Engineering Building and Structures Lab

The goal of this activity was to introduce Dr. Makdisi to the current research that is being conducted by Iowa State in the civil, construction, and environmental fields. This event was attended by Dr. Makdisi and the EERI chapter president, Jacob Eull. The tour consisted of a general walk through of the CCEE building at Iowa State and a tour of the two structures labs within the building. The tour highlighted the current projects being completed in the lab.

Student Chapter Meeting and Presentation

The goal of this meeting was to present Iowa State student chapter to Dr. Makdisi, as well as have a more informal meeting for members to ask questions about Dr. Makdisi's work, education, life, etc. The event was attended by Dr. Ashlock, the chapter advisor, Jacob Eull, chapter president, Phuong Vo, USDC captain, and two other members of the chapter. A copy of the presentation is attached in the appendix.

RESULTS, FEEDBACK AND LESSONS LEARNED

- One challenge that was faced was the scheduling conflicts from members due to the event being held on the Friday before Easter. The date for the visit was set in December and it was too late to change one it was realized that the event was taking place on Good Friday.

- The reception of the visiting professional was very good. Many professors had interest in meeting with Dr. Makdisi to discuss his work. Additionally, the presentation was well attended by students and faculty. Many students were also able to eat lunch with Dr. Makdisi and ask questions in a more informal setting.

- In future visits our student chapter would like to have an industry professional from a structures background come and speak. Dr. Makdisi gave a great presentation in the area of geotech and to increase the student chapter's knowledge our goal is to get a professional in a different discipline to speak.

ACKNOWLEDGEMENTS

The Iowa 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.

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:

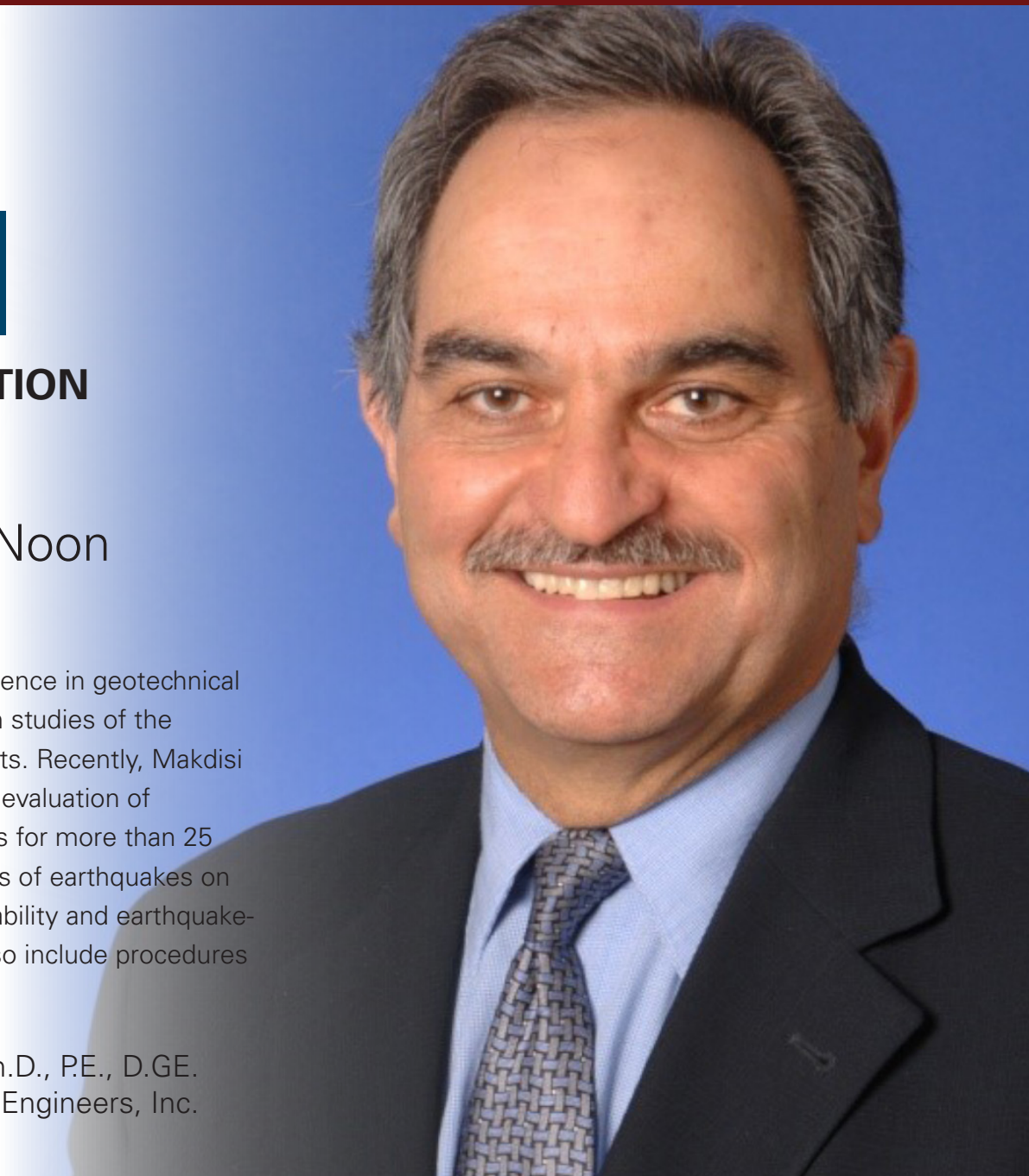
- Attachment 1: flier for event
- Attachement 2: Iowa State Student Chapter Presentation
- Attachment 3: Photos of Dr. Makdisi's presentation

EERI Iowa State University student chapter

Iowa State University
Department of Civil, Construction and Environmental Engineering

FAIZ MAKDISI

SEISMIC STABILITY AND DEFORMATION OF EMBANKMENT DAMS



Friday, April 14, 2017 | 11 a.m. - Noon
250 Town Engineering Building

Dr. Faiz Makdisi has more than 39 years of specialized experience in geotechnical and earthquake engineering. He has been actively involved in studies of the seismic behavior of earth and rock fill dams and embankments. Recently, 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. His 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. It will also include procedures and examples from current engineering practices.

FAIZ MAKDISI | Ph.D., P.E., D.GE.
Senior Principal Engineer | SAGE Engineers, Inc.

IOWA STATE UNIVERSITY
College of Engineering

EERI Iowa State Student Chapter

Presenter: Jacob Eull

April 14th , 2017

Club Overview

- Approximately 30 members
- Mix of undergraduate, graduate, and PhD
- Looking to grow within CCEE and with outside majors

EERI Lecture Seminar Series

- Multiple seminars throughout year highlighting research

- Open to all graduate and undergraduate students

EERI Iowa State University student chapter

Iowa State University EERI Student Chapter

Community Outreach

- Seminars for STEM advancement in middle school
  - Around 30 students per session

- Used K'neex to introduce seismic building design

Community Outreach

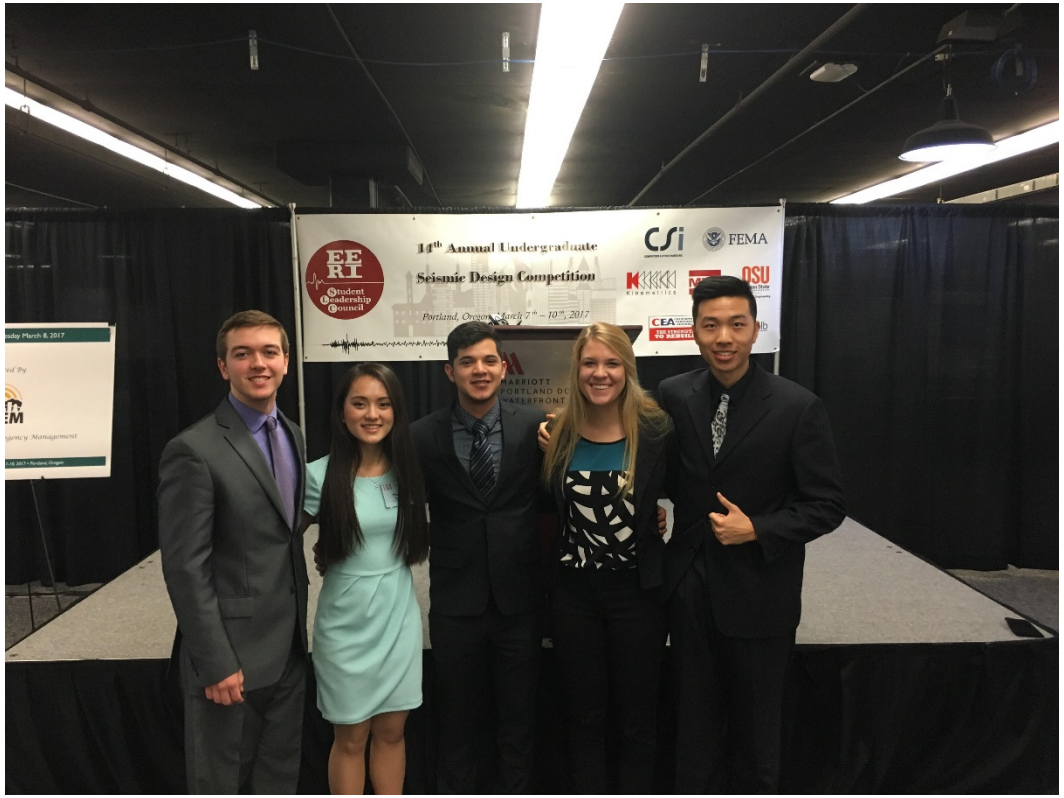
EERI Iowa State University student chapter

Iowa State University EERI Student Chapter

Undergraduate Design Competition

- Held in Portland, Oregon
- 30 teams from around the world
- Team Captain: Phuong Vo

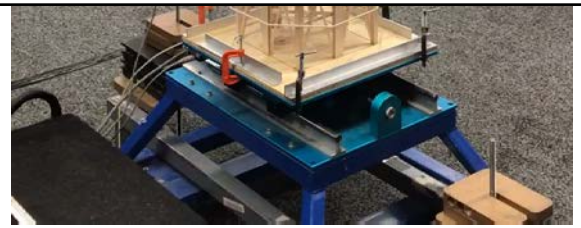
Undergraduate Design Competition



EERI Iowa State University student chapter

Iowa State University EERI Student Chapter

2017 Shaking of Structure



Questions?

Introduction

- Name
- Emphasis (structures, geotech, etc)
- Year of study