

# FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM



## Visit to University of California Davis: June 1<sup>st</sup>, 2023

This report summarizes the visit of **Dr. Faiz Makdisi** from Gannett Fleming, Inc that took place at the University of California at Davis on June 1<sup>st</sup>, 2023,

### ITINERARY OR AGENDA

TIME:	ACTIVITY:
10:00 am – 11:00 am	Meeting with <i>Dr. Alejandro Martinez</i>
11:00 am – 11:45 am	Student Discussion: <i>Transitioning to Industry after Graduate School</i>
12:00 pm – 01:15 pm	Friedman Family Visiting Professionals Program Lecture
01:15 pm – 02:15 pm	Lunch with Geotechnical and Structural students at the Gunrock
02:15 pm – 03:00 pm	Tour of Structural and Geotechnical labs
03:00 pm – 04:00 pm	Meeting with <i>Dr. Jason DeJong</i>
04:00 pm – 05:00 pm	Tour of Center for Geotechnical Modeling with <i>Dr. Jason DeJong</i>

### STUDENT CHAPTER VISIT PLANNING COMMITTEE

#### LEAD ORGANIZER(S):

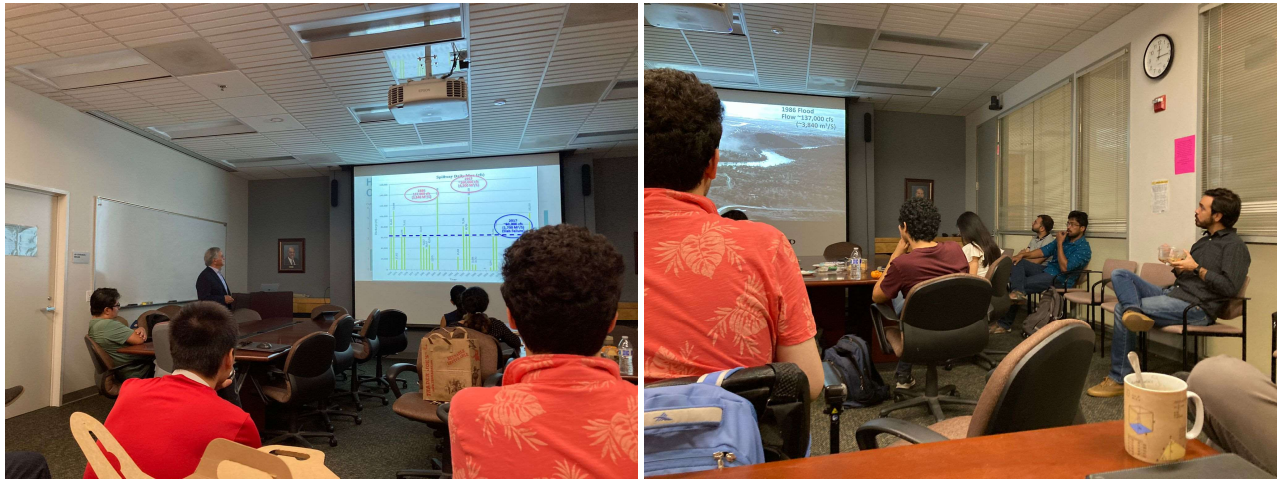
- Aditya Jhunjunwala, co-president, [arjunhunwala@ucdavis.edu](mailto:arjunhunwala@ucdavis.edu)
- Laura Luna, co-president, [luna@ucdavis.edu](mailto:luna@ucdavis.edu)

#### FACULTY ADVISOR:

- Professor Sashi K. Kunnath

### VISITING PROFESSIONAL LECTURE OVERVIEW

The chapter had the honor of hosting Dr. Faiz Makdisi, who presented a lecture entitled “*The Oroville Dam Spillway Emergency Recovery Project*”. The lecture was attended by undergraduate and graduate students in the Civil and Environmental Engineering department. The lecture provided a description of the slab failure of the control spillway chute at Oroville Dam during February 2017, which resulted in significant damage to the spillway channel and erosion of its underlying foundation. Dr. Makdisi's perspective as part of an independent forensics team was particularly insightful and allowed students access to a unique insight into the recovery response program that followed after this famous dam incident. The lecture was attended by a group of approximately 15 students and faculty, and coffee and snacks were provided for attendants.



*Friedman Family Visiting Professional Program Lecture, presented by Dr. Faiz Makdisi*

## Lecture Abstract

### ***The Oroville Dam Spillways Emergency Recovery Project***

This lecture provides a description of the incident of slab failure of the control spillway chute at Oroville Dam during a February 2017 spill that resulted in significant damage to the spillway channel, and erosion of its underlying foundation. This prompted the operation of the emergency. The potential for undermining of the foundation of one of the emergency spillway monoliths lead to an evacuation of close to 200,000 residents downstream of the dam. The presentation describes the postulated mechanisms of failure, a summary of the findings and conclusions of an Independent Forensic Team that identified factors that most likely contributed to the failure. The immediate recovery response program is described that included an expedited design schedule, an appointment of an independent review board, interaction with the regulatory agencies, and selection of a construction contractor. Elements of the design and reconstruction of both the control spillway chute and emergency spillway during two construction seasons are presented together with the lessons learned from this incident.

## Professional Bio

Dr. Faiz Makdisi obtained his Bachelor of Engineering from the American University of Beirut and his M.Sc. and Ph.D. degrees in Geotechnical Engineering from the University of California at Berkeley. With over 40 years of expertise, he has been actively involved in the seismic behavior of earth and rock fill dams and embankments. Together with the late Prof. Seed, he developed the simplified procedures for estimating dynamic response and permanent deformations in such structures. Throughout his career, Dr. Makdisi has contributed significantly to seismic design criteria, seismic stability evaluation, and the design of remedial measures for embankment dams. He was awarded the 1977 Norman Medal by the American Society of Civil Engineers. He served as a Technical Advisor to the Los Angeles District, Corps of Engineers, receiving recognition for his contributions to the design and construction of Seven Oaks Dam. He has also served on various review boards for dam projects, including Oroville Dam Spillway Restoration, Perris Dam, Castaic and Crafton Hills Dams, B. F. Sisk Dam, and five Delta Dams. In recognition of his enduring contributions to dam safety, Dr. Makdisi was honored with the Danny K. McCook Medal by the Association of State Dam Safety Officials in 2017. In 2019, he was elected to the Civil and Environmental Engineering Academy of Distinguished Alumni by the University of California at Berkeley.

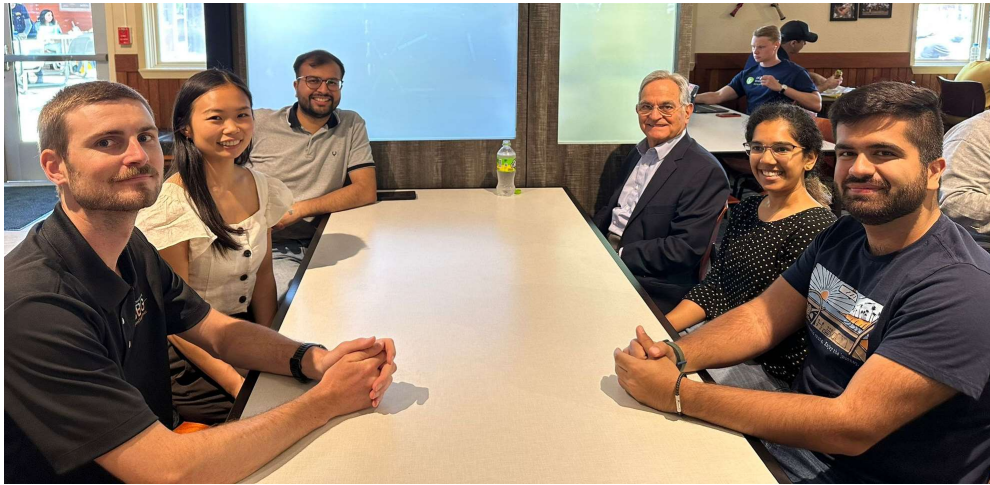
## SUPPLEMENTAL ACTIVITIES

### Student Discussion: Transitioning to Industry after Graduate School

Before the lecture time, Dr. Makdisi kindly met with a group of 10 graduate students that are near their graduation date. An informal discussion was held on "Transitioning to Industry after Graduate School", in which students had the opportunity to ask questions about working in the industry and get advice from a seasoned professional. Students were particularly fascinated by Dr. Makdisi's experience working on the San Fernando Dam after a major earthquake, which inspired his decision to pursue a doctoral degree.

### Lunch with students

After the lecture time, a group of 8 graduate students had lunch with Dr. Makdisi and had informal conversations about the profession.



### Tour of the Geotechnical and Structural labs with PhD students

After Lunch, the PhD students from Geotechnical engineering gave a lab tour Dr. Faiz Makdisi and briefed him with the experimental and computational research being done at UC Davis.

### Meeting with Prof. Alejandro Martinez and Prof. Jason DeJong

Geotechnical faculty Dr. Jason DeJong and Dr. Alejandro Martinez had one-on-one meetings with Dr. Makdisi and offered a tour of the Center for Geotechnical Modeling centrifuge facilities.

## RESULTS, FEEDBACK AND LESSONS LEARNED

The EERI Student chapter at UC Davis is grateful for the opportunity to participate in the Friedman Family Visiting Professional program and looks forward to the next opportunity to interact with Earthquake Engineering professionals.

The visit by Dr. Makdisi proved to be an insightful and inspiring occasion for all participating students. Interacting with him provided a unique opportunity to delve into the intricacies of the industry and gain practical knowledge firsthand.

## ACKNOWLEDGEMENTS

The UC Davis 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 UC Davis EERI Student Chapter also acknowledges the support by the Graduate Geotechnical Student Society at UC Davis for sponsoring the refreshments during the seminar and the lunch of Dr. Makdisi with students.

## LIST OF ATTACHMENTS

- Announcement for event
- Slideshow for EERI student chapter





Student Chapter  
at UC Davis

# The Oroville Dam Spillways Emergency Recovery Project

**Speaker:** Faiz I. Makdisi, Ph.D., P.E., D.GE  
*Senior Consultant, Gannett Fleming, Inc.*

Thursday, June 1<sup>st</sup> @ 12:00 p.m.  
Room 3102, Ghausi Hall



GGSS  
at UC Davis

## ABSTRACT

This lecture provides a description of the incident of slab failure of the control spillway chute at Oroville Dam during a February 2017 spill that resulted in significant damage to the spillway channel, and erosion of its underlying foundation. This prompted the operation of the emergency. The potential for undermining of the foundation of one of the emergency spillway monoliths lead to an evacuation of close to 200,000 residents downstream of the dam. The presentation describes the postulated mechanisms of failure, a summary of the findings and conclusions of an Independent Forensic Team that identified factors that most likely contributed to the failure. The immediate recovery response program is described that included an expedited design schedule, an appointment of an independent review board, interaction with the regulatory agencies, and selection of a construction contractor. Elements of the design and reconstruction of both the control spillway chute and emergency spillway during two construction seasons are presented together with the lessons learned from this incident.

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## Earthquake Engineering Research Institute Friedman Family Lecture

Hosted by:  
EERI Student Chapter @ UC Davis  
Geotechnical Graduate Student Society @ UC Davis

June 1st, 2023

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### EERI UC Davis Student Chapter – Officers



Aditya Jhurjhumwala



Laura Luna



Prof. Sashi Kunnath  
Professor Advisor

Earthquake Engineering Research Institute | Student Chapter at UC Davis

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### EERI UC Davis Student Chapter – Activities

- Matlab and Python Bootcamps
- Undergraduate Seismic Design Competition
- Involvement with the EERI Young Member Forum activities
- Friedman Family Visiting Professional Lecture
- Internal seminars and social activities

Earthquake Engineering Research Institute | Student Chapter at UC Davis

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## The Oroville Dam Spillways Emergency Recovery Project

Faiz I. Makdisi, Ph.D., P.E., D.GE  
Senior Consultant, Gannett Fleming, Inc.

June 1st, 2023

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