Your Link to the Department of Civil Engineering

CE CONNECTION

FALL 2019 | ISSUE 30

ITE Conferences Offers Opportunity & Enrichment for Transportation Engineers.
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SACRAMENTO STATE
Department of Civil Engineering

CHAIR'S MESSAGE

Dear alumni, colleagues and friends,

It's been a busy semester with many successes – I'm excited for you to learn about all of the activities and successes we've had this Fall semester!

The department continues to thrive as more and more students are applying to the civil engineering program, both at the undergraduate and graduate levels. We were also happy to introduce a new tenure-track faculty member to the student body this semester – Dr. Zoi Dokou – who specializes in water resources engineering. Professor Dokou has been a fantastic addition to the faculty and I encourage you to read about her first semester experiences on page 18.

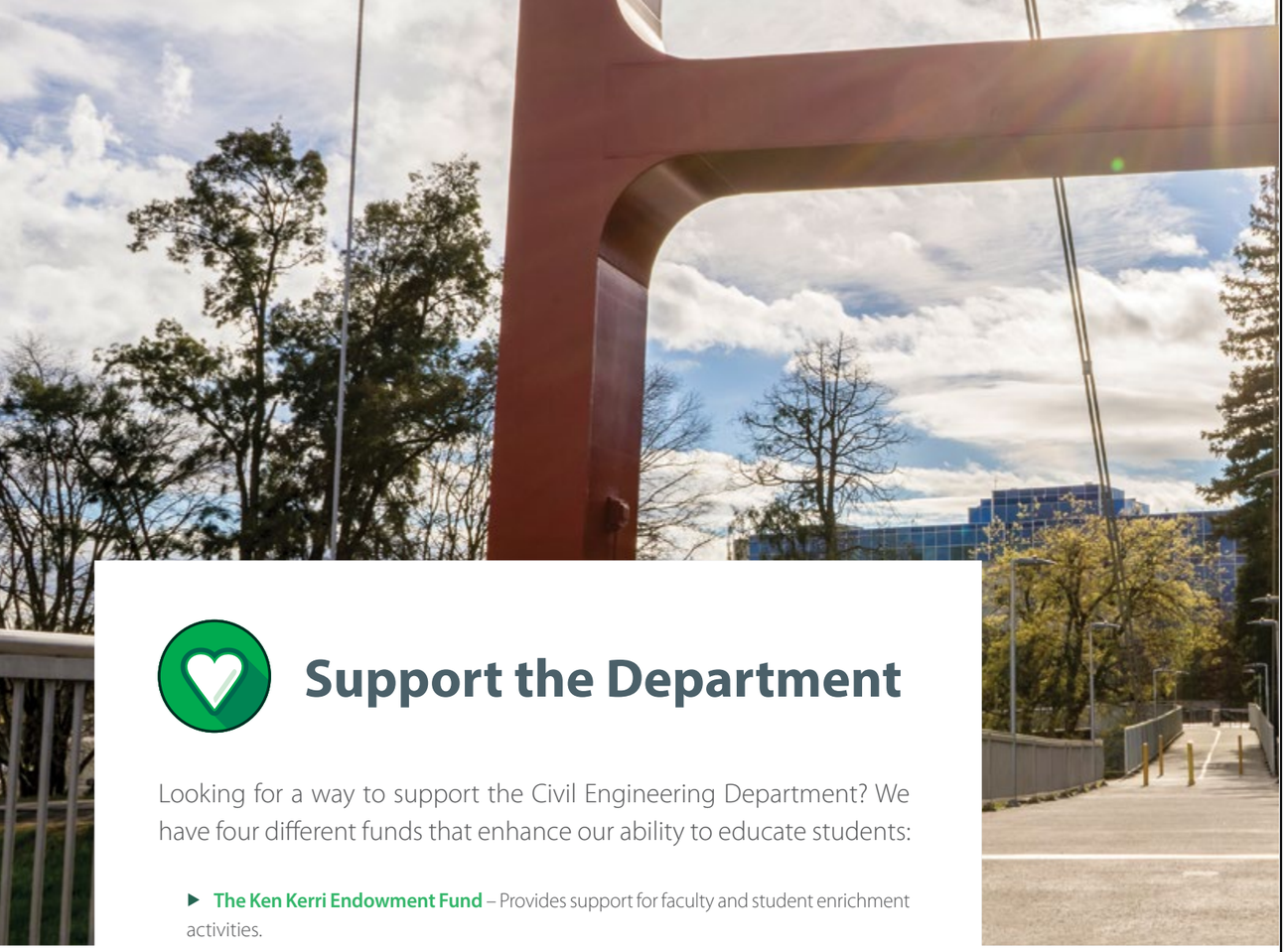
In other faculty news, Dr. Eric Matsumoto led a team of students who participated in a national precast beam competition, winning first place in the team report and video submission categories. Also, Dr. Ghazan Khan was recognized with a CSU-wide award for his efforts with curriculum development and student success in the transportation engineering area. Both accolades are significant achievements for our students and faculty. I also hope you have an opportunity to read about Alexander Wright, a geotechnical engineer with Kleinfelder who has been serving as a lecturer in the undergraduate soil mechanics course during the last several years. With many of our courses taught by professional engineers like Alex who are looking to give back to the community and education of future engineers, I am delighted to have the opportunity to highlight their efforts.

You'll find a variety of other articles in this issue ranging from the golf tournament to reconnecting with recent graduates. I hope you enjoy the newsletter and that it continues to serve as your connection to the Department of Civil Engineering at Sacramento State.

Warm wishes for a safe and happy holiday season.

Ben Fell
Chair, Department of Civil Engineering

SACRAMENTO STATE
Department of Civil Engineering



Support the Department

Looking for a way to support the Civil Engineering Department? We have four different funds that enhance our ability to educate students:

- **The Ken Kerri Endowment Fund** – Provides support for faculty and student enrichment activities.
- **The CE Freshman Scholarship Fund** – Scholarships to outstanding freshmen.
- **The Graduate Environmental/Water Resources Scholarship Fund** – Scholarships to deserving graduate students in the environmental or water resources engineering areas.
- **The Department Trust Fund** – These resources support student attendance and participation at conferences and competitions, senior design project team expenses, and equipment for labs when other funds are not available.

To donate to any of these funds, go to **http://bit.ly/ceonlinedonate** and follow the directions for online donations.

- Or mail a check made out to the appropriate fund to:

  Attn: Ashley Mihok
  California State University, Sacramento
  Department of Civil Engineering
  6000 J Street, MS 6029
  Sacramento, CA 95819

- For additional questions on how to give, contact:

  Nebrisa Fish '05
  Director of Development
  (916) 278-2453
  nebrisa.fish@csus.edu

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Upcoming Events

Gain access to all of these events through the Department of Civil Engineering Sponsorship Program! Information for 2019 sponsorship is now available at:

2019 Sponsors

April 15, 2020:

Ken Kerri Endowment Fund Luncheon, Sacramento State

www.csus.edu/ecs/ce

Like us, and follow us to stay up to date on current CE News and Events!

Save the Date!

12th Annual KEN KERRI ENDOWMENT FUND Luncheon

Wednesday, April 15TH | 11:45am - 1:30pm | CSUS Alumni Center

The12th Annual Ken Kerri Endowment Fund Luncheon will be held on Wednesday, April 15th, from 11:45am to 1:30pm in the Sacramento State Alumni Center. **Lunch will be provided.**

This year's keynote speaker will be Tim Washburn, Director of Planning at the Sacramento Area Flood Control Agency. Mr. Washburn has been a member of the SAFCA since 1990 and has been a key figure flood management systems for several decades.

If you would like to attend this year's event, or if your organization would like to become a sponsor of the Ken Kerri Endowment Fund, please reach out to **Ashley Mihok: ashley.mihok@csus.edu**.

Event RECAP

Sneak Peak:

Into An Evening With Industry

This year's event was a night of both enrichment and opportunity as roughly two hundred students packed the Alumni Center for the annual Evening with Industry. The three hour event was a chance to listen and learn from industry professionals, and students took the opportunity to discuss topics ranging from professional life to continuing education after completing undergraduate studies. This year's keynote speaker, Louis Stewart, Chief innovation Officer of the City of Sacramento, challenged students to learn to tackle problems, "Outside of the box," and turn, "What if," questions into tangible solutions to everyday problems. Industry professionals met with students afterwards to discuss internships and upcoming projects. The event was also attended by civil engineering faculty, who were impressed not only by the number of attendees, but also by how many returning professionals the recognized.

Check back with the CE Connection in the Spring of 2020 for our full article.

Event

RECAP

A Hole in One:

8th Annual Golf Tournament Unites Students, Faculty, and Alumni

> "I love golf, so to be able to represent my company as well as my school was amazing. It was my first time on this course but I thoroughly enjoyed [it]."
>
> — Leslie Fung

The Department of Civil Engineering hosted its 8th annual Golf Tournament this past September. Each year, Sac State faculty head out to the Mather Golf Course for a day of friendly competition.

"Our 8th Annual Golf Tournament was a great success," said Dr. Benjamin Fell, the Department Chair of Civil Engineering. "This year we had twenty students, many of whom were on the golf course for the first time, participate and play in groups with civil engineering professionals. We tried our best to pair the students with companies that do the type of work they're interested in. Everyone had a great time, and it was fun for me to reconnect with alumni and friends of the department."

Jonathan Kors, PE, of Wood Rodgers, Inc., graduated from Sac State in December 1995 and has maintained contact with his alma mater by serving on the Environmental and Water Resources Engineering Industry Advisory Committee. He enjoyed the chance to meet students one-on-one by being out on the field. When asked what he appreciated most about the day, Kors replied, "Seeing a lot of industry people that I don't get to see very often…and meeting new people. I always seem to meet somebody new that I am really glad I met."

Leslie Fung, PE, of Mark Thomas, also spoke positively about her experience of the event. "I love golf," Fung stated, "so to be able to represent my company as well as my school was amazing. It was my first time on this course but I thoroughly enjoyed [it]." Fung, also a graduate of Sac State, expressed her pleasure in being able to remain connected with the school. "I spent my entire college career at Sac State and under the Civil Engineering program. It's great that Dr. Fell keeps in touch with alumni like me. Everyone on my team was a Sac State Civil Engineering Alumni…we all take great pride in where we went to school."

All proceeds from the event supported the Department of Civil Engineering, but everyone benefited from a day on the course, including undergraduates. Kors mentioned two upcoming graduates were on his team, "that were a blast to play golf with and are very accomplished in their CSUS academic career and recent internships. We've since offered them both jobs." One of those students quickly moved forward with her offer, and is slated to begin her new career just after graduation, starting in January. Kors was quite pleased about providing such a rare opportunity to new students: "I'm really pleased to be adding another great young CSUS grad to Wood Rodgers."

If you or your company is interested in participating in next year's tournament, feel free to contact Ashley Mihok: ashley.mihok@csus.edu. It's never too early to send an inquiry.

Summer Classes Offer Chance to

Get Ahead & Achieve Timely Graduation Goals

As spring semesters draw to a close, most students rejoice at the thought of wrapping up finals, being done with school, and maximizing their summer by taking a break from the rigor of studying. An increasing number of students, however, would rather utilize their summer time and maximize its academic potential. Instead of taking a break, they want to get ahead of the game and manage their classes in a cost-effective way by taking summer classes that will prepare them for earlier graduation or give them a step up when school returns to session in the fall.

The Department of Civil Engineering has taken these requests very seriously, and recognizes the concerns of its students. "One mechanism we have been using to ensure access to required coursework, and thus timely completion of the degree, has been scheduling courses in the summer session," said Dr. Benjamin Fell, Department Chair. "Students have seemed very appreciative as it provides flexibility to accommodate a variety of constraints to taking fifteen or more units in the regular semester."

This past summer, several core curriculum classes were scheduled, including water resources, structural analysis, reinforced concrete design, engineering mechanics, statics and statistics. Unlike traditional semesters, where twelve or more units are considered a full time course load, the summer semesters are shorter. It only takes six units to be considered a full-time student, and only three for halftime status. Fewer units, however, don't necessarily equate to an easier workload.

Ravina Ahir, a senior anticipating graduating in May 2020, was enthusiastic, but not naive, about this reality regarding taking full-time summer classes. "Having two summer classes…was a challenging experience. There is no time for someone to get bored during summer school because there is so much to do. At first I did struggle to keep up with the material but after figuring out a method to study, do homework and work at the same time, things flowed nicely."

> "Taking summer classes has been beneficial for me because I gained better study skills and it also helped me manage my time. It has assisted me by putting me ahead of schedule as far as graduating."
>
> — Ravina Ahir

Mark Kobrya, who is a Junior, shared similar insights. "Only one week into the summer I knew I had to allocate more time to it [studying] if I wanted to get everything I could from the class. But after a quick adjustment to my schedule I was able to get back on track and enjoy the material being taught." As a transfer student planning on graduation in the fall of 2020, summer classes are not optional, but a necessity. "I am currently taking two classes because I completed the prerequisites over summer," he continued. "That would not have been possible without summer school. It also is allowing me to stay on track with my personal goal to be able to try and have a lighter final semester here at Sac State."

Despite the challenges and intensity of the summer curriculum, students benefit from its availability. Often, those who take summer courses come away with a deeper understanding and appreciation of the material because the smaller class lineup allow for more focus on the courses at hand. "Taking summer classes has been beneficial for me because I gained better study skills and it also helped me manage my time," Ahir says. "It has assisted me by putting me ahead of schedule as far as graduating."

Ahir encourages other students to not be daunted by concerns over the fast pace or workload, and she offers this piece of advice for students wanting to advance their academic standing by taking classes in the summer: "Don't procrastinate and [don't] give up. It will get hectic and the best way to manage it is to take the stress a day at a time." Kobrya agrees, adding one further strategy: get to know your professors. "The summer session goes by fast, so it is important that you feel comfortable to come up to your professor and ask for help as soon as you need it, that way you stay on track."

ITE Conferences Offers *Opportunity & Enrichment* for Transportation Engineers

Each year, the Western District of the Institute of Transportation Engineers (ITE) holds a weeklong conference for engineering professionals to come together, discuss their research, and brainstorm ways to get students, both at the undergraduate and graduate levels, involved with the organization.

This year's meeting was held from June 22nd through the 26th in Monterey, CA. Dr. Masoud Abadi and Dr. Kevan Shafizadeh traveled to the conference. Accompanying them were four students: three undergraduates and one graduate, all part of the ITE chapter at Sac State.

"We try to approach students who are actively engaged in this chapter, and who want to pursue a career in transportation engineering," Dr. Abadi said about the selection process. The opportunity to attend this year was just as exciting for him as it was for Dr. Shafizadeh and the students. "This was my first time attending as a university professor!"

The theme for this year's conference was "Harboring the Future on Transportation," a topic that Abadi is very keen on exploring along with his students. He termed it a "hot topic," because, through the innovations of key companies in the state of California, autonomous transportation is on the horizon. Figuring out how to accommodate this new technology, via smart cities, communication between vehicles, and even communication between infrastructure, will be of upmost importance in the coming years.

The conference included technical presentations from across the state and nation. Industry professionals, faculty from universities, and even graduate students discussed their projects and research. All were extremely detailed, with some presenters having faced extreme challenges in order to achieve their goals. One of the biggest takeaways for Abadi was the student leadership forum, where each university ITE chapter was given the opportunity to learn from the achievements of other chapters. "It's a win-win situation," he said of the panel, "…we learned from the dynamics of the other chapters."

There were several events occurring simultaneously alongside the presentations. The exhibit hall was lined with vendors, with dozens of representatives from companies all working within the field of transportation. Many showcased their products and gave demonstrations of the work they had accomplished utilizing them. A huge surprise, Dr. Abadi noted, was that, "There were Sac State alumni all over." The students were enthralled. "They stayed and talked with them [the alumni]," Abadi said, and the students conversed with as many industry professionals as they could.

There were also opportunities for the students to network with peers along with industry professionals. There were games, competitions, and even tech tours along Monterey's famous 17 Mile Drive. All of this was geared towards building a sense of community and shared interest within the transportation engineering community.

"Soon," Abadi acknowledged, "these students will be in industry, and they will need to rely on these relationships for their future successes."

After the excitement and positive experience of this conference, Dr. Abadi now has his sights set on attending the conference in June 2020, to be held in Hawaii. Despite the fact that the conference won't be quite as local, he believes bringing another group of invested students to attend would continue to be a benefit for the ITE chapter as well as for the College of Engineering. The exposure to industry, the networking, and the interaction with professionals makes the ITE Conference an event not to be missed.

National Acclaim for Sac State's
PRECAST BRIDGE STUDIO

It's a cool and dark October night when Dr. Eric Matsumoto gathers with his students to observe the precast bathtub bridge girder being erected on Zinfandel Drive, where the street crosses over Highway 50 in Rancho Cordova. Though nearly 1am, the mixed group of undergraduates and graduates doesn't show a hint of fatigue while they stand in the middle of the closed-down lanes of the highway, witnessing 500-ton cranes lifting the 130-foot segment of the precast bridge into place. This will widen the overpass in both directions, helping to ease the traffic congestion in the area. All in all, from start to finish, the girder installation itself takes only fifteen minutes.

The next afternoon, Dr. Matsumoto is still enthralled with the previous night's events. "My students are still buzzing about the experience. It's one thing for me to theorize about Accelerated Bridge Construction, but it's altogether different for students to see it live," he explains.

This experience was made possible by a new program that focuses on providing real-world bridge experiences for engineering students. The Precast/Prestressed Concrete Institute (PCI) Foundation was established ten years ago by Jim Voss, the President and General Manager of JVI, Inc. in Chicago. Voss, an industry leader in the development and fabrication of precast connection hardware utilized by the industry, noticed a disturbing trend: While universities could create a decent curriculum for its student body, the lack of interaction between students and industry professionals left a giant chasm of experience and knowledge that was quickly growing wider. With major developers heading to retirement, Voss knew that time was limited to develop proper succession within the precast industry—to find, "fresh faces," as Matsumoto phrases it.

Those "fresh faces," Voss and several other industry professionals realized, could be found by partnering their organization with universities. Its goal was to close the rift by implementing a pre-cast curriculum at four-year universities via a grant. These funds were allocated to developing both classroom education and extracurricular experiences, so students could make the connection between their studies and real-world applications. The program had been around a decade by the time Sac State received its grant in 2018, and was the first program to focus on the design and construction of precast bridges.

The Sac State Precast Bridge Studio, or PBS, has since become a source of education and enrichment both inside and outside of the classroom. Part of the previous semester's curriculum included four bridge design-and-build teams, each working under a set of mentors who were professionals within their field. They were charged not with design of a multi-span girder bridge, but also its fabrication, hauling, installation, cost and construction sequence. Other aspects of the program included field trips to fabrication companies, such as Con-Fab in Lathrop and Sumiden Wire in Stockton, and guest speakers, including contractors, precast seismic experts, and precast software developers.

One of the most notable accomplishments of Sac State's precast activities was its, "Big Beam Team," which earned the "Best Report" and "Best Video" national awards totaling $2,000. The student team was honored at the September 2019 National PCI Committee Days luncheon. During this luncheon, Sac State also received special recognition for its highly-evolved curriculum experiences and innovative approaches to precast bridge design and construction.

Matsumoto is thrilled about the program's successes thus far, and not just because the students have responded positively to the rare opportunity presented to them. Students involved directly with PBS have demonstrated an increasing interest in the program and their major, motivating them beyond what is simply expected in the classroom. It's not just civil engineering students that are receiving these benefits. Through his partnership with Prof. Mikael Anderson, Dr. Matsumoto has helped establish an integrated program between civil engineering and construction management students—the first in the college and the first bridge-focused program in the country supported by the PCI Foundation.

In the summer of 2020, Sac State will host the summer 2020 PCI Foundation Professors Workshop, a meeting of other program participants from universities around the country. Its goal will be to continue paving a path that will equip students to become the next generation of precast industry professionals. By hearing directly from Dr. Matsumoto, Professor Anderson, program mentors, and Sac State students, other universities will be able to learn from Sac State and consider how to implement a similar curriculum at their own schools.

Matsumoto is proud of the work that Sac State has accomplished, and the example the school has set at the national level. He also acknowledges the importance of support from the PCI Foundation, recognizing that the cooperation between the Foundation and Sac State, "is a genuine win-win: a benefit to our students, to the university, and to the professional community, extending to the precast concrete industry and well beyond," he says. It's a benefit that will continue to enrich Sac State, and its community, for years to come.

Where Are They Now?

Keeping up with Our Graduates

Sacramento State Alumni graduate with the skills and education to pursue a multitude of different careers. Many have worked on incredible projects, employed with agencies such as CalTrans and the Department of Water Resources. In this edition of the CE Connection, we catch up with two recent graduates. Both have, through their research and their careers, been able to apply the knowledge gained at Sac State in order to fully pursue their dreams.

Alex Zhengjian

Initially from Shanghai, China, Alex Zhengjian graduated with his Master's degree in Civil Engineering this past semester. He has since transferred to Oregon State University to pursue his PhD in Environmental Engineering. "I submitted my master thesis by July 13th," Zhengjian explains, "[and] then I started my PhD studies on July 15th."

Zhengjian's time is split between studying and his job as a graduate research student at OSU. To say his PhD studies are intense would be an understatement. "In the first three semesters, I need to complete a total of five courses, along with my research work. For example, next semester I am taking an advanced math modeling class and water chemistry class. Both of them are closely related to my research."

On the employment side of his work, Zhengjian's advisor studies how the growth of some bacteria—specifically, Escherichia coli— is inhibited by metallic glasses stemming from sources such as pure copper, crystallized metallic glass, and amorphous metallic glass. He is also studying nutrient removal from manure wastes, and nutrient removal/recovery from leachate wastes.

Being a student at his place of employment isn't always easy. Some of his research is similar to what he studied at Sac State as a graduate student, under the mentorship of his advisor, Dr. Amir Motlagh. Other techniques are, for Zhengjian, uncharted territory. "The aerobic granular sludge membrane bioreactor (AGSM) might be similar to my previous work in Sac State with a Moving Bed Biofilm reactor (MBBR)," he says, however, "… the other two projects are brand new to me, and my supervisor requires me to write the protocol by myself." Sometimes, Zhengjian's research leads him to dead ends, but he still maintains a positive attitude. "I never fear the defeats and always go back to discuss [them] with my supervisor to fix the issues. I enjoy the process of troubleshooting lab results. I believe every failure will allow me to improve, and eventually achieve my goals."

His goals include graduation with a PhD in four to five years, and the ability to pursue one of his favorite hobbies: traveling. "Although I love travel a lot," says Zhengjian, "I did not have a chance to travel or go on vacation after graduation. However, I plan to travel back to Sacramento at the end of each month." The reason for the frequent trips? "I have to visit my wife and my seven-month-old boy. They will move to Oregon next year."

GRADUATE Profile

Amanda Konieczka

Amanda Konieczka did not start her education at Sac State. Although being from the Sacramento area, Konieczka traveled to CSU Chico in order to receive her Bachelor's degree in Civil Engineering. "It was a great school," she says, "but it didn't have a Master's program with an emphasis on transportation program, and that's what I wanted to continue my education in. I also wanted to complete school near home." Returning to the area meant Konieczka had to readjust to life back home, and had to find work while attending Graduate School. Thankfully, she didn't have to make a choice between the two. "I completed my graduate degree at Sac state while working. They make it convenient and possible for working students!" she exclaims.

During her time as a graduate student, Konieczka attended as many extracurricular events as she could, including An Evening with Industry—an occasion she was later invited to attend as a panelist once she had graduated in 2014.

Since graduation, Konieczka has been involved with several roadway and transportation projects. Her most recent has been part of the State Route 132 Phase 1 Project improving State Route 132 in the City of Modesto and Stanislaus County. "The project consists of constructing a two lane expressway from SR 99 to Dakota Avenue with full access control and grade separations at intersections," she explains. "The project will improve regional and interregional circulation, relieve traffic congestion along the existing SR132, and improve traffic operations." Being in on the action is just one of the many thrills Konieczka gets to experience on a daily basis. "Transportation engineering is rewarding because you get to see and experience the work you have accomplished as you are driving around," she says—but also admits that she's taken a step back in recent months. Her and her husband, Michael, welcomed their first child together in June. Though always focused on advancing her career, Konieczka says, "Now I'm getting to be a little more family focused," and for her this is just fine—the roads aren't going anywhere anytime soon.

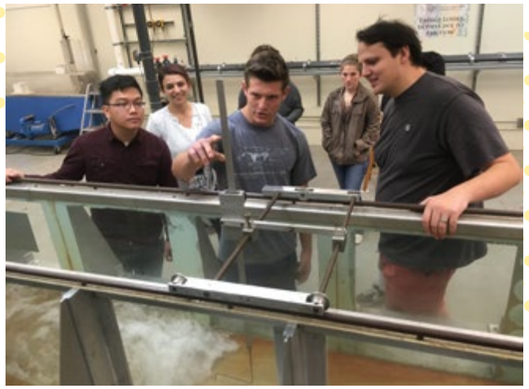
GRADUATE Profile

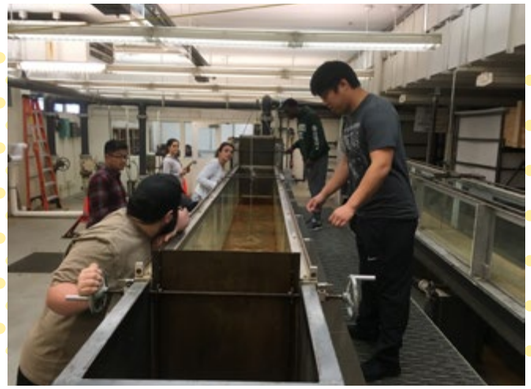
WORLD *Traveler:*

Dr. Zoi Dokou and Her First Semester at Sacramento State

When Dr. Zoi Dokou arrived at Sacramento State a few weeks before the beginning of the Fall 2019 semester, she got to work on claiming her office as her own. In addition to her books and her computer, she took care to put up her poster collection, gathered from National Parks she has been honored to visit. Posters include majestic scenes from the Grand Canyon and the Everglades, and two paintings from her favorite city in Greece: Chania. She's far from being done collecting images of majestic places. "Yosemite will be the next one to be collected for sure," she beams.

Previously introduced in our Summer 2019 edition, Dr. Dokou drove across the country over the course of the summer in order to see as much of the United States as she could before arriving in Sacramento. Her trip was a success, and she arrived safe and sound with just enough time to get her bearings before the beginning of the new semester. Dokou credits Cristina Poindexter and Saad Merayyan, faculty with the Civil Engineering Department, as helping her make the transition as smooth as possible.





Dokou is teaching two classes: CE 135 (Hydraulics lab) and two sections of ENGR 132 (Fluid Mechanics). Each class has its own unique experiments and labs to run, and Dokou enjoys comparing the labs to actual locations so that students have a deeper understanding of the correlation between these sites and their coursework. One such lab includes creation of a hydraulic jump, and Dokou utilizes examples of the failure of the Oroville Dam in 2017 as an example of what her students should avoid doing in the classroom. "My students (and I) were very excited about this lab," she recalls brightly. "It is really cool to see the jump form as you control the flow using the downstream gate of the flume."

There are also those who see Dr. Dokou's addition as a sign of diversity among Sac State's faculty. "During the first day in one of my classes," Dokou recalls, "when I asked students to share something about themselves or something they look forward to learning in the class, a female engineering student shared that this was the first time she had a female professor, and she was really looking forward to it. I felt that this was a great honor and at the same time [a] responsibility for me, and I was reminded of the importance of female representation in engineering."

Along with a full academic load, Dokou is also continuing the research she began during her time spent at the University of Connecticut. The National Science Foundation project, termed PIRE (Partnerships for International Research and Education) aims to cross cultural and geographical hurdles to secure basic resources for people living in Ethiopia. This is done through the development of seasonal forecasts using groundwater and crop yield models, and also incorporates a deep understanding of political and societal roadblocks that may hinder continued research. Dokou is also researching groundwater issues in California. By working under the guidelines provided by the Sustainable Groundwater Management Act (SGMA), her plan is to research effective groundwater techniques, study surface water/groundwater interactions, identify optimal groundwater management plans, and investigate possible contamination concerns. Dokou is already utilizing the groundwater contamination risk index created by the Office of Water Programs at Sac State to aid in her research in identifying at-risk communities.

Dokou's research will continue well into 2020, a year that is already jam-packed with activity. "Next semester I will be teaching a graduate class on Groundwater Hydrology (CE 276), where students will use groundwater modeling tools." She will also be putting per passport to good use once again. In March, Dr. Dokou will travel to Delhi, India to be a co-convener for the 36th International Geological Congress (IGC) and the Young Earth Scientists Symposium (YES), where she will discuss her research on geophysical techniques to improve groundwater modeling and management.

Though her research is taking her across the globe, the importance of close interactions with students is not lost on Dokou. "One day in the Lab we were using the open channel flume to measure water flow rate using a weir. When the lab ended, you would expect the students to want to leave as soon as possible. Instead, they asked me if they can stay a little longer. They were filled with such anticipation for the hydraulic jump lab that was scheduled the following week that they asked me if they could try to create a jump on the flume and they all got very into it...They successfully created a hydraulic jump by controlling the downstream gate opening and took pictures of it, [they were] very satisfied and excited. This was an amazing moment for me, because it demonstrated how engaging laboratory classes can be for the students as they get the opportunity to practice themselves the theoretical concepts they learned during lecture and experience their practical application in real-life situations."

A Song of Soil:

An Interview With Alexander Wright

Just under one year ago, Alexander Wright, P.E., joined the Department of Civil Engineering as a lecturer. He splits his time between classroom education, working with Kleinfelder, and the Earthquake Engineering Research Institute (EERI). Recently, we sat down with Mr. Wright to talk about his life, his introduction to Sac State, and his favorite topic: ***soil.***

Tell us about your time at Sac State. Did you complete your undergraduate/graduate work here? If not here, where?
I completed my undergraduate and graduate work (masters) at Brigham Young University (BYU) in Provo, Utah. As an undergraduate I completed research with Dr. Kyle Rollins of BYU on ground improvement using stone columns. Later as a graduate student I researched performance based evaluation of liquefaction hazards. As a graduate student I also worked as a teaching assistant for the introductory soil mechanics class and a class on seepage and slope stability.

I was first introduced to the students at Sacramento State when I had the opportunity to work with some of the students participating in the EERI Seismic Design Competition. I was impressed with their dedication to the practice of civil engineering, their hard work, and their openness to new ideas and new ways of doing things. After interacting with the students informally for a time I had the opportunity to become a lecturer here at Sacramento State, and was excited to be able to participate in teaching enthusiastic and interested students.

> The most rewarding part of working as a civil engineer is the silent ability to help others."
>
> ***— Alexander Wright***

Were you part of any extracurricular activities? Did you complete an internship?
Service has played a major role in my own personal professional development. At the time I was in school there were not a lot of internship opportunities available as we were just coming out of the great recession. However, I took advantage of the opportunities available to me which included volunteering with the student chapter of EERI, working part time as a volunteer and later a paid research assistant, and working part time as a teaching assistant for various classes. This volunteer and part time work at the university helped me to get my first job at Amec Geomatrix in Oakland, California and put me in a position to help others along the way.

What drew you to geotechnical engineering?
My path to geotechnical engineering is different from most. From a very young age I knew that I was interested in soils. As a young child, my friends and I regularly built "earth and rock fill dams" across our street gutters – much to our parents chagrin. [Later] as an elementary age student I did projects on liquefaction, site response, and soil pH. When I started at the university level I had a hard choice between the geology and geotechnical engineering degree programs. In the end I selected geotechnical engineering in part due to circumstances at the time, and in part due to my love of seismic hazards and soil. Very influential in this choice was Dr. Rollins who took me on a field trip to a job site and showed me my first mechanically stabilized earth wall!

Are you involved with any research projects at this time?
I spend more of my time on civil design than research. A great deal of my time at Kleinfelder has been recently spent on slope instability remediation design near Marysville and on design of a rock slope protection system to help limit erosion in the Upper Mormon Slough. Design projects are interesting because they require a close coordination between a wide variety of professionals to produce high quality, cost-effective designs that meet clients' needs. It is also great to stand back and see a completed project at the end and know that you have improved the conditions for those that use the site in the future.

What's it like working as a "Project Professional" with Kleinfelder?
At Kleinfelder my work varies day to day. Some days I am in the field watching construction or providing field investigation oversight; other days I am in the office working on design plans and specifications or writing reports. One of the great things about being an engineer is that each day will be different and will hold its own challenges and successes.

Tell us about your position as a "lecturer" at Sac State.
I work with Drs. Aryani and Armstrong to teach the CE 171A Soil Mechanics class. Each semester I teach a Tuesday/Thursday lecture and three labs introducing students to soil mechanics and its role in engineering design. Soil mechanics is an exciting class (in my 'unbiased' opinion!) because it deals with one of the most fundamental materials to all engineering projects: the earth's surface. Over the course of the semester we show students how this material works, what it is made of, and why it matters to civil design. This sets up students to be able to go on to design level course work in 171B, graduate school, or as they begin their personal practice.

What are some of the strengths of the students you see around you?
I think the thing that stands out the most to me about students at Sacramento State is their ability to find joy in any circumstance. They also have a drive to succeed and a willingness to help others that goes above and beyond. I think combining this with the skills we provide them will set them up well in life if they continue to serve others, support one another, and build on the truths they have already learned.

What do you find most rewarding about your chosen industry?
The most rewarding part of working as a civil engineer is the silent ability to help others. Our work often goes unnoticed… We provide the safe environment for our communities and nations to grow and expand. Seeing a project…improve the lives or the communities we live in is a reward in itself.

Dr. Khan Wins

Faculty Innovation & Leadership Award

Each year, the California State University Faculty Innovation and Leadership Award is presented to faculty within the CSU system who have made an impact on students, been seen as leaders and innovators among their faculty peers, and contributed to their field of expertise in a way that impacts the university and community at large. Of the more than two hundred potential candidates for this year's award, only nineteen were chosen. One of those nineteen individuals was Sac State's own Dr. Ghazan Khan, Associate Professor in the Department of Civil Engineering.

Dr. Khan, who has been a member of the Sac State faculty for six years, received his award as part of CSU's Graduation Initiative 2025 Symposium, which took place between October 17th and 18th. "It was very humbling," Dr. Khan said of being notified that he was a recipient. In addition to the $5,000 cash prize and a $10,000 grant to the Civil Engineering program at Sac State, Khan also was struck by the beauty of the award itself: a glasswork depiction of the state of California.

"It was designed and handcrafted by students in the Department of Arts at California State University, Fullerton." Dr. Khan described in detail. "It's a beautiful piece of artwork."

The award was granted in part due to the research Dr. Khan has conducted with his students in the Transportation engineering field at Sac State. This has included, but is not limited to, traffic operations and safety, applications of Geographic Information Systems (GIS) in transportation engineering, and autonomous/self driving vehicles. Dr. Khan's work in the latter field recently made headlines as he, working alongside Tony Lucas at University Transportation and Parking services, was instrumental in acquiring the first autonomous university shuttle for a test run on Sac State's very campus.

Dr. Khan was very proud of that accomplishment, since Sac State beat out several other universities that were vying for the opportunity to experiment with the shuttle on their own campuses. The test, he says, was a "success," and despite only having the shuttle, nicknamed "Ollie," for a short time during the spring 2019 semester, results were positive. Even Dr. Khan himself got to experience being on board the autonomous shuttle. "I was able to ride the shuttle while it was here," Khan shared his experience. "When I first got on, I was aware that there was no driver. But within a minute or so of being on board, I quickly forgot about it and focused on other things." This seemed to be the experience of the students as well. During the three month program, Khan made sure that his transportation engineering students took advantage of the opportunity given to them. Not only did they study the mechanics behind the shuttle operation, but they also explored public opinion about the vehicles, gaining a better understanding of the real-world applications and opinions of autonomous transportation within today's society.

Another recognizable achievement for Dr. Khan includes his work with the Sacramento County Department of Transportation. By partnering closely with the agency, Khan was able to provide his class access to real-time information from intersections across the county, exposing students from both the College of Engineering and the College of Computer Sciences to raw data that could be used to transform areas into safer areas for vehicles and pedestrians alike.

Khan is always looking for ways to give his students chances to reach beyond the classroom and apply what they have learned to the world around them. It's this devotion to his students and their success that is recognized by the presentation of the Leadership Award to Khan. While he says he is "blessed" to have received it, his thoughts immediately turn to acknowledging his mentors and students as his greatest influences. "I couldn't have received this award without them," he says. "Our students are incredible and to be able to mentor them in the classroom and help them succeed in their future endeavors is an amazing opportunity."

Sac State Faculty

Participates In Nationwide Conferences

Despite a full schedule including proposal writing, teaching courses and advising students, Dr. Julie Fogarty managed to find time to attend not one, but two major national Engineering conferences.

The 2019 NASCC Steel Conference, held in St. Louis, Missouri, took place from April 3-5th. The annual event features a tradeshow as well as specialized conferences to allow professionals from around the nation to discuss their growing knowledge and achievements within the engineering world. "The educator session is always useful," Fogarty says. "Learning about available resources from [the] AISC and discussing different pedagogy techniques being used by steel design instructors at various points in their career from across the country is invaluable."

For this year's conference, Dr. Fogarty was able to participate in a welding workshop run by the organization, "Women Who Weld." This growing nonprofit teaches welding skills to women and assists them with finding employment within the welding industry. As an instructor, Fogarty appreciated both the actual demonstration as well as the hands-on experience of the workshop. "While I've done some small-scale welding in the past, it's always helpful to have more hands on experience with the topics I discuss in class, and now I have some physical examples to pass around to students when they're trying to visualize built-up sections and connections as we do design calculations."

The other major event on Fogarty's schedule was the ASEE conference, put on by the American Society of Engineering Education, which took place from June 16th through June 19th. "I was at the conference for less than 48 hours," Fogarty laments, "because I needed to be back for the summer school course I was teaching. I attended a couple of interesting sessions focused on different pedagogy techniques used in civil engineering courses." She also got to see, on display in the exhibit hall, promising technology that could one day be utilized in Sac State's graphics course. It would be useful, "…for helping students scaffold up to visualizing and representing more complex 3D objects in 2D space," explains Fogarty.

During the ASEE conference, Fogarty gave an oral presentation on research she has been conducting. "My presentation at ASEE was about the impact of the undergraduate service learning course that has students teaching STEM activities in an after-school program at local K-6 schools," says Fogarty. "In general, the course changes undergraduate students' ideas about STEM and STEM teaching strategies, their perception of young students' abilities to engage in STEM, and increases self-confidence and desire to pursue a teaching career."

FACULTY Spotlight

Cristina **Poindexter**

Danielle Salt measuring flashboard elevation at a California dam.

Dr. Cristina Poindexter is a member of the Faculty in the Department of Engineering. Recently, she has been partnering with the Office of Water Programs to utilize new technology to create inundation maps that gauge potential flooding areas in the event of dam failure. We invited her to discuss her research below.

Please tell us specifics about your study: what were the main dams you studied?

The project, a team effort at the Office of Water Programs (OWP), involved simulating inundation areas due to dam failures at seven small dams. The project came about because of new regulations following the Oroville Spillway Incident. New regulations require owners of most dams under the jurisdiction of the Division of Safety of Dams (DSOD) to submit an inundation map that shows the area that would be subject to flooding during a failure. Separate from the main study, we are comparing two different software tools for simulating inundation areas after a dam failure. One is probably the most popular tool, HEC-RAS, from the US Army Corps of Engineers. The other is a tool that is currently only available to dam safety officials and their contractors: DSS-WISE-Lite. DSS-WISE Lite is a product of the National Center for Computational Hydroscience and Engineering (NCCHE) at the University of Mississippi.

Who funded the study (if any particular group) and how long did it progress?

The main project was conducted on behalf of the dam owners with funds from a grant originating with FEMA. It took about a year. The comparison of the two simulation tools is ongoing.

What were some of the initial findings of the study? Were there any results/figures/data that came out unexpectedly?

We found that, in most cases, the two simulation tools produce very similar inundation areas if given the same hydrograph (the flow rate over time at the dam). Each tool has its own advantages. DSS-WISE Lite is very easy to use including for dynamic simulations of flow through a reservoir and out of a dam breach. HEC-RAS allows for the model of the terrain downstream of the dam to be modified if necessary.

Is there a way to see the map that was created for the report?

All inundation maps approved by DSOD are available at this link:
https://water.ca.gov/programs/all-programs/division-of-safety-of-dams/inundation-maps

Were any Sac State interns/alumni involved in the study with you, or who assisted in some form?

The project to map inundation areas and produce technical memos documenting the process was a team effort involving OWP staff engineers and GIS specialists, myself and two graduate student assistants. One of the graduate students, Danielle Silk, took the lead on the comparison of HEC-RAS and DSS-WISE Lite, and her comparison of the two simulations tools for one dam failure formed the basis of her master's project.

What is the next step to take with your research?

We are expanding the comparison of inundation areas simulated by HEC-RAS and DSS-WISE Lite to include more dam sites. A current master's student is comparing the inundation areas for a different dam. A different type of comparison, a comparison of the hydrographs simulated by the two software tools, is also ongoing at OWP.

When will the full study be published?

The results of the comparison of the two software tools will probably be published sometime next year.

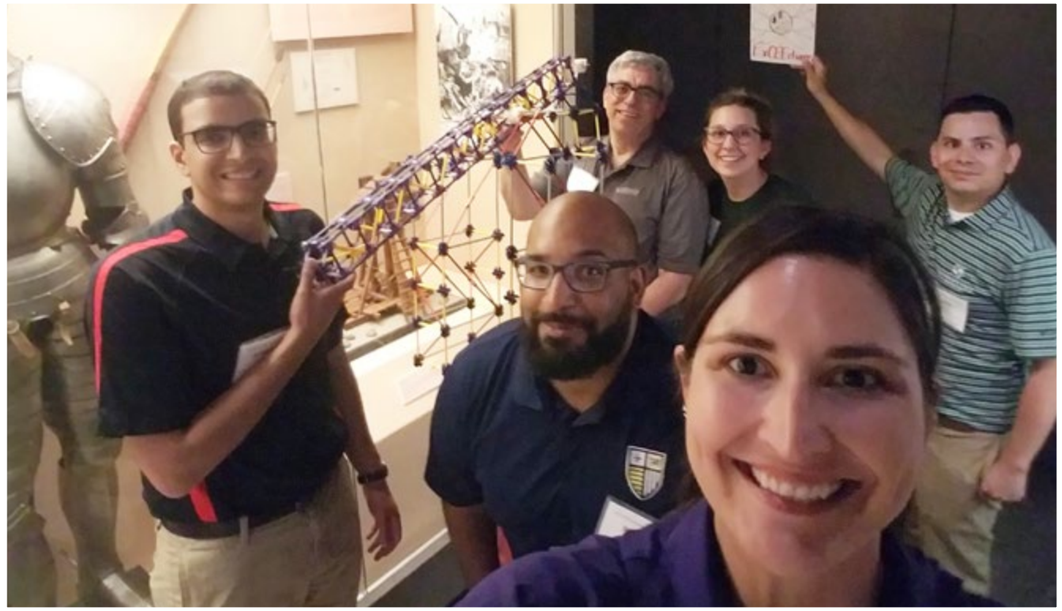
Tell us about your thoughts on being able to contribute to such an important project: in your own words, what is most fulfilling for you? Do you see your research as a contribution to disaster preparedness, or something more?

It's been very fulfilling to work on a project that could help keep people safe in the event of an emergency. The inundation maps will be used in the preparation of emergency action plans for each of the dams and these plans are intended to be used during an emergency to identify which areas to evacuate. I've incorporated problems from the project, such as dam spillway discharge calculations, into some of the courses I teach: Fluid Mechanics and Water Resources Engineering. I noticed that problems based on these real situations really engaged students. Also, the ease of use of DSS-WISE Lite makes it a great resource and I think it's helpful to know that it produces very similar results to HEC-RAS when given identical terrain data and other inputs.

Experiencing ExCEEd

"I have even more respect for people serving in the military. This was an incredible opportunity, and these lessons and skills will impact hundreds of students each year. I'm very thankful to have been part of it."

— Jose Garcia



Professor Jose Garcia received the opportunity of a lifetime this past summer when he attended the ExCEEd Teaching Workshop, held at the United States Military Academy at West Point. The workshop, held from July 21st through 26th, aims to supply professors with an array of skills and tools to reach students and connect with them in the classroom. It's a highly competitive program; educators from around the country apply to one of the three sessions held each year, and many apply numerous times before they are accepted. To his delight, Garcia was accepted after his very first application.

"I was very excited," Garcia recalls with fondness. "I was very happy about being able to attend."

To be selected for the group at West Point was a thrill due to the location's specific role in the history of civil engineering education. "Engineering is very important to the military," Garcia explains. "When the military deployed, they had to build basic infrastructure, like shelter, roads, and a source of water. West Point was the first school to offer Civil Engineering classes in the country." Garcia further emphasizes that the initial instructors were officers that taught cadets what they would need to know to make a settlement when deployed. As the officers themselves were shipped off, instructors were replaced by those who were not as prepared to offer such a detailed level of education to their students. ExCEEd, the Excellence in Civil Engineering Education Workshop, was founded to pass on to other instructors what was learned from those initial years of trial and error. Initially, the program was only offered to Army instructors. Eventually, it extended to other military branches, and finally, it was opened to the public.

Students attending this year's West Point Workshop arrived on the 20th of July in order to get oriented for the upcoming week. The twenty-four participants were broken up into four teams of six members. Each team had one mentor and one assistant mentor. Garcia's team was led by Retired U.S. Army Brigadier General Steven Ressler, Ph.D. Licensed as a professional engineer, General Ressler has an extensive background in both the Industry as well as in education: at his retirement, he had been the Department Chair of West Point.

"We were given an 'insider tour' of the military academy," Garcia says, but despite the presence of the Workshop attendees, West Point was still completely up and running. General Ressler, "was our escort at all times."

Once the program commenced, the participants jumped into a massive routine. "It was intense," Garcia continues. "Our hotel was fifteen miles from West Point, and we all stayed at the same place. We had to be out the door by 7:00 am to get to the workshop on time, and we wouldn't get done until 11pm. We had assignments due the next day; often we would work past 12am and wake up at 5:30 a.m. to finish."

There were twelve seminars taught throughout the six days, covering topics such as principles of effective learning and teaching, class organization, correct methods of classroom communication, teaching assessments and feedback, and development of interpersonal communication with students. There were three demo classes and five lab sessions where participants recorded themselves using the techniques learned during the morning lectures. The mentors would provide feedback on strengths and weaknesses. "This proved extremely helpful," Garcia acknowledges with much appreciation. "We were given insight into everything, including proper whiteboard technique, posture, and even how to hold our markers." Participants would break briefly for meals—this included the occasional MRE—and jump right back to work. "It was only a week long, but we felt like it was a month!"

By the end of the week, the Workshop had tied all of the lessons together to provide unique and engaging methods of educating students back at their home universities. One of the most significant lessons Garcia brought back with him, and has already implemented into his class this semester, is the importance of demonstrations. "I went to Home Depot and bought five dollars' worth of supplies. I drew a grid on a foam beam and I have used the beam in class. I could see it in the students' eyes: 'Oh, this makes sense!' When we show students demos, it keeps them engaged, and it shows, 'This is why this is important.' All that for five dollars and a few minutes of time."

Overall, Garcia is thrilled with his experience. He became close with his teammates, as well as the other participants. He also came away with an even deeper appreciation for General Ressler and the other members of West Point who came together to make the Workshop possible. "I have even more respect for people serving in the military," he says. "This was an incredible opportunity, and these lessons and skills will impact hundreds of students each year. I'm very thankful to have been part of it."

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