GRADUATE STUDIES

COLLEGE OF ENGINEERING
School of Civil and Construction Engineering
Dear Prospective Graduate Student:

Thank you for your interest in the College of Engineering's School of Civil and Construction Engineering (CCE) at Oregon State University. The school is a dedicated group of students, faculty, and staff who are solving some of the world's toughest challenges and creating a better future.

These are exciting times at Oregon State. With research focused in safety, resilience, and infrastructure renewal, CCE has over $7.8 million in research expenditures. In the geomatics group, researchers employ state-of-the-art drones, laser scanning, and 3D visualization in their work. Researchers in the school are also developing new methods to strengthen aging infrastructure, prepare for potential hazards, identify liquefaction susceptibility, and enhance workplace safety. These are just a few examples of the exceptional work at CCE – a visit to our campus will provide many more.

Within CCE, there are nine focus areas of teaching and research. The school works in a collaborative approach – with other academic units, local and federal government, and industry – to positively influence the environment and to tackle local and global challenges. This cooperative approach has led to a major effort in developing a new resilience network. A specific example is the Cascadia Lifelines Program, a partnership between Oregon State, regional governments, and private industry aimed at improving critical infrastructure performance and transportation modeling during an anticipated major earthquake along the Cascadia Subduction Zone.

CCE offers a wide range of courses and research opportunities that allow students to choose from a variety of focus areas in which to specialize. Students are also encouraged to pursue an interdisciplinary approach to their research and many programs permit students to take up to 15 hours of courses in a minor area of their choice.

While at CCE, graduate students conduct their research in first-rate facilities. The O.H. Hinsdale Wave Research Laboratory is one of the world's largest and most technically advanced laboratories for coastal research. The Driving and Bicycling Simulator is one of only a few where a driver and bicyclist can interact in the same virtual environment. Additionally, the school is in the process of launching a revolutionary new 40,000-square-foot research facility.

CCE students have the opportunity to connect with alumni and industry partners, many of whom visit campus frequently and are eager to support students. This network helps CCE graduates remain on the cutting edge of research and connects them to their future profession.

Thank you again for your interest and I hope you enjoy your visit to Oregon State. I look forward to your contributions and the impact you will have on Oregon – and beyond.

Go Beavs!

Sincerely,

Jason Weiss
Head of the School of Civil and Construction Engineering
The Miles Lowell and Margaret Watt Edwards Distinguished Chair in Engineering
Director of the Kiewit Center for Infrastructure and Transportation Research
SCOPE AND OBJECTIVES

The graduate program in Coastal and Ocean Engineering at Oregon State University emphasizes the interdisciplinary nature of research and education on emerging themes related to natural coastal hazards such as tsunamis and hurricanes, as well the effects of climate change including sea level rise and increasing storminess. Additional themes include marine renewable energy, coastal ecology, and resilient and sustainable communities. Our program seeks to enable students to pursue research topics that cross the traditional boundaries of coastal engineering, and to prepare students for leadership positions in academia, private, and public sectors.

SAMPLING OF COASTAL AND OCEAN ENGINEERING COURSES

- CE 411/511 - Ocean Engineering
- CE 415/515 - Coastal Infrastructure
- CE 417/517 - Hydraulic Engineering Design
- CE 631 - Ocean Eng. Wave Mech. II
- CE 634 - Long Wave Mechanics
- CE 635 - Applied Modeling of Nearshore Processes
- CE 639 - Ocean Structure Dynamics
- CE 642 - Random Waves
- CE 643 - Coastal Engineering
- CE 645 - Wave Forces
- CE 647 - Ocean and Coastal Engineering Measurements
**STUDENT SPOTLIGHT • CHUAN LI**

**WHY OREGON STATE?**
Oregon State University's coastal and ocean engineering program is among the top in the field.

**HOW DID YOU BECOME INTERESTED IN COASTAL AND OCEAN ENGINEERING?**
I have enjoyed going to the coast since I was young. Over the years I have learned about the various challenges at the coast, such as those concerning public safety and navigation. I became very interested in learning more about the coast and in helping to address those challenges.

**DESCRIBE YOUR CURRENT RESEARCH.**
My research is on wave runup, which is the extent that a wave reaches onto shore. We are motivated by the unusually large wave runups – sometimes referred to as “sneaker waves” – that often pose a danger to the public and are especially prevalent in the Pacific Northwest. We aim to better understand the conditions that lead to the occurrence of these unusually large runups, which would help improve our ability to predict them. Our methods involve a combination of field observations, laboratory experiments, and numerical modeling.

**WHAT ARE YOUR PLANS FOLLOWING GRADUATION?**
I plan to seek a position at the U.S. Army Corps of Engineers.

**WHAT DO YOU LIKE ABOUT OREGON STATE?**
I’ve been grateful for the faculty and students here, as well as the classes I’ve taken and the research facilities and resources on campus. Oregon State provides a great environment for education and research.

**WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?**
I like that Corvallis is close to the coast and a major city, while not having the feel of a tourist vacation spot or the complications of a big city. In addition, the nature and landscape of the Pacific Northwest are quite special.

**ANYTHING ELSE YOU WOULD LIKE TO SHARE WITH PROSPECTIVE STUDENTS?**
I think it’s a good idea to come visit if you haven’t already. Get a tour of the campus in general and the department/school you’re applying to.
CONSTRUCTION ENGINEERING MANAGEMENT

GRADUATE STUDIES IN CONSTRUCTION ENGINEERING MANAGEMENT

SCOPE AND OBJECTIVES

Construction Engineering and Management is the application of scientific and technical knowledge to the processes used to construct infrastructure projects. Graduate studies in the Construction program at Oregon State emphasize construction engineering and management concepts and techniques and their broader application to the Architecture/Engineering/Construction (A/E/C) industry.

The instructional program is highly interdisciplinary and aims at developing strong abilities to conduct construction engineering and management work involving basic concepts and principles, technical analysis, planning, design, and management, and the development of knowledge that positively impacts the A/E/C industry. The program provides students with skills in planning, designing, and implementing construction processes and systems. The course offerings provide a broad awareness of construction concepts and an understanding of scientific and technical knowledge to address construction problems.

SAMPLING OF CONSTRUCTION ENGINEERING COURSES

CE 507 - CCE Grad Seminar
CE 520 - Engineering Planning
CE 524 - Contracts and Specifications
CE 527 - Temporary Construction Structures
CCE 520 - Advanced Concrete Construction
CCE 525 - Construction Site Systems Engineering
CCE 526 - Design for Safety in CCE
CCE 528 - Advanced Virtual Design and Construction
CCE 529 - Lean Construction
CEM 541 - Heavy Civil Construction Management
CEM 543 - Project Management for Construction
CEM 550 - Contemporary Topics
CEM 551 - Project Controls
CEM 552 - Risk Management
CEM 553 - Construction Business Management
WHY OREGON STATE?
I began pursuing my PhD studies in 2015. Toward the end of the first year of my PhD studies, my advisor, Dr. Yelda Turkan, asked me if I would like to transfer to Oregon State University along with her. In a heartbeat, I answered ‘Yes’. I am convinced, even today, that it was one of the best decisions I had ever made.

HOW DID YOU BECOME INTERESTED IN CONSTRUCTION ENGINEERING?
My interest in construction management gradually grew while exploring different courses during my undergraduate studies. Initially, I was unsure of what subdiscipline within civil engineering to pursue. Luckily, I had the opportunity to engage in research work during my third year, which further fueled my interests in the area. The research experience exposed me to the multitude of problems plaguing our industry. The potential research opportunities in this field intrigued me, and that is when I decided to pursue graduate studies.

DESCRIBE YOUR CURRENT RESEARCH.
I am working on a project that focuses on developing a framework that will help state highway agencies to track the progress of bridge construction projects. My work involves collecting and processing large volumes of lidar data, and using it together with four-dimensional Building Information Modeling for generating progress information. This funded by the Oregon Department of Transportation.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
I have thoroughly enjoyed my research experience so far, and I want to continue the academic route. While the construction sector in Nepal is full of opportunities, it is marred by malpractices and inefficient construction processes. Eventually, I want to return to my country and apply what I have learned for my future endeavors. I hope to achieve this by starting a consulting business over there.

WHAT DO YOU LIKE ABOUT OREGON STATE?
I like the location of the campus, the excellent faculty and the rigorous curriculum. The learning environment in the classrooms made me feel like the faculty want to see me succeed and inspired me to always give one hundred percent in whatever I do. The excellent research expertise of the faculty is a huge bonus, and I have always felt like I can approach anyone for help and advice. I could not have asked for a better graduate school experience. Overall, I am thankful for the endless academic and social possibilities at Oregon State that inspire me to become a better-learned person each day.

ANYTHING ELSE YOU WOULD LIKE TO SHARE WITH A FUTURE STUDENT?
I entered graduate school at Oregon State, eager to bring many changes and excited at the prospect of creating new things, but I had never anticipated how the entire graduate school experience would change me. This transformative journey has taught me many things about myself and has changed my outlook on things. I am grateful to have had such an enriching experience, and none of this would have been possible without the guidance, nurture and love that the faculty and Oregon State, in general, has provided me with. I have had one of the most wonderful experiences of my life at Oregon State and encourage others to have their share of wonderful experiences here.

SAFETY FIRST
Oregon State is widely considered one of the leaders in construction safety research. Working collaboratively with funding agencies, industry, and academic partners like the Oregon Department of Transportation, faculty within the school regularly investigate, contribute, and improve how the A/E/C industry approaches construction safety within the built environment.

WOMEN IN BUILD
In 2017, BUILD Magazine named CCE a winner of the 2017 Women in BUILD Award in recognition of gender diversity efforts. Between 2013 to 2017, there was a three-fold increase in female faculty and the female population in the graduate student body increased by approximately 6.5 percent.

A PLACE TO EXPLORE
The Pacific Northwest is a well-known destination for travelers around the world, particularly for those with an interest in the outdoors. Oregon is home to 13 national forests, 21 national wildlife refuges, 361 state parks, as well as national scenic areas and national grasslands. Factor in Corvallis’ ideal location in the central Willamette Valley, an outdoor adventure is always just a few steps away.
ENGINEERING EDUCATION

GRADUATE STUDIES IN ENGINEERING EDUCATION

SCOPE AND OBJECTIVES

Graduate study in Civil and Construction Engineering Education at Oregon State integrates fundamentals of civil and construction engineering with the learning sciences. Students will develop expertise in contemporary theories and practices on how people learn in academic and professional settings. Our program seeks to enable students to be leaders in academia and industry as experts in both civil and construction engineering technical content and how people learn, adapt, develop, and succeed in these fields.

SAMPLING OF ENGINEERING EDUCATION COURSES

At least two thirds of civil and construction engineering education graduate student’s coursework will consist of civil and construction engineering courses. A sample of the learning science and educational research courses available for selection are listed below.

CE 590 - Engineering Teaching and Learning
SED 621 - Survey of Research on Learning
SED 623 - Curriculum Theory
SED 611 - Survey of Research on Teaching
SED 612 - Quantitative Research Design and Critical Analysis
SED 613 - Learning Theory
ChE 599 - Engineering Education Foundations
WHY OREGON STATE?
When I was considering graduate schools, my undergraduate advisors recommended that I take a look at the engineering education program at Oregon State, which is unique in that it integrates both civil engineering and education fields. The research projects really appealed to me, and during my first visit to Oregon State, my advisor and the staff were very welcoming. It was then that I knew the university was a good fit.

HOW DID YOU BECOME INTERESTED IN ENGINEERING EDUCATION?
After graduating with a structural engineering major at UC San Diego, I was offered a job as the Engineering Outreach Coordinator for the Center for Research on Educational Equity, Assessment and Teaching Excellence at UC San Diego, providing engineering outreach support for various UC San Diego grants and projects. With my background, expertise and experience working with the K-12 community, I started to see that pursuing an engineering education degree was essential in order to develop STEM opportunities for under-served and underrepresented students at all levels.

DECRIBE YOUR CURRENT RESEARCH.
My current research involves analyzing and comparing the performance of undergraduate and professional engineers on strength of material concepts. Results can provide a better understanding of what concepts students are actually taking to the field as well as providing insight into which curricular materials need to be improved to enhance undergraduate engineering education.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
I’d like to obtain a position as a tenure-track faculty in engineering education. I’m interested in designing and leading research projects that study new, scalable paths to engineering, specifically undergraduate teaching and coursework and to contribute to the efficient development and growth of future engineers and increase the representation of women and underrepresented minorities in STEM.

WHAT DO YOU ENJOY ABOUT OREGON STATE?
Oregon State is a friendly place and there are so many opportunities to be involved. The civil engineering department feels like a second home. Everyone is helpful and supportive. They’re all invested in your success.

WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?
The campus is beautiful. The trees are amazing! I enjoy being able to experience four seasons and the beauty of the local hiking trails.
GRADUATE STUDIES IN GEOMATICS ENGINEERING

SCOPE AND OBJECTIVES

Graduate study in Geomatics Engineering at Oregon State University integrates fundamental spatial data and boundary law theoretical knowledge with practical applications. Students gain exposure to the latest in geomatics technologies and boundary theory. The M.S. and M.Eng. programs prepare students for careers in civil engineering geomatics design, consulting, development, regulation, or construction. Additionally, the M.S. program provides the background for students more interested in teaching, research, or specialization to pursue the Ph.D. degree.

Students pursuing graduate school who have a BS degree in Civil Engineering (ABET\EAC) or Construction Engineering Management (ACCE) who take 16 credit hours of approved civil engineering geomatics courses are eligible to sit for the Fundamentals of Surveying Examination in addition to the Fundamentals of Engineering Examination in the State of Oregon.

Interdisciplinary studies are encouraged for geomatics students. Up to 15 hours can be spent to focus in a minor area (within CCE; e.g. geotechnical, transportation, ocean, etc.) and outside (e.g. geosciences, computer science, etc.) or other, if desired, and related to research or future goals.

SAMPLING OF GEOMATICS ENGINEERING COURSES (CREDIT HOURS)

CE 507 - SEM/Geomatics Seminar (1)
CE 513 - GIS in Water Resources (3)
CE 560 - ST/GNSS & Geometric Geodesy (4)
CE 560 - ST/Advanced Geospatial Info (4)
CE 560 - ST/Fundamentals of Geodesy (4)
CE 560 - ST/Hydrographic Surveying (4)
CE 561 - Photogrammetry (3)
CE 562 - Digital Terrain Modeling (4)
CE 563 - Control Surveying (4)
CE 565 - Oregon Land Survey Law (3)
CE 566 - 3D Laser Scanning and Imaging (4)
CE 567 - Coastal Remote Sensing (4)
CE 568 - Least Squares Adjustments (3)
CE 569 - Property Surveys (3)
CE 661 - Kinematic Positioning & Navigation (3)
WHY OREGON STATE?
I’m originally from Oregon and started at Oregon State as an undergrad in civil engineering. I chose to stay at Oregon State for graduate school because the geomatics program is excellent and I felt I had more opportunities to pursue here. In short, my experience as an undergrad was great and I realized there’s nowhere I’d rather be for grad school.

HOW DID YOU BECOME INTERESTED IN GEOMATICS?
As an undergrad, I started working on a geomatics research project just to get involved with research. I really connected with the practical focus. It’s about applying the tools we have to solve problems in better ways. Geomatics is applicable to so many areas; it means each project has new and interesting things. Plus, working with the technology is a lot of fun.

DESCRIBE YOUR CURRENT RESEARCH.
My master’s thesis research is an accuracy assessment of GPS under different overhead conditions while comparing the expanding number of available satellites systems. GPS receivers estimate an accuracy themselves. However, there is limited current peer-reviewed work to evaluate those estimated accuracies or predict accuracies before data collection. My goal is to provide an estimated accuracy, before data collection, based on the overhead visibility at a site and the number of satellites the user is expected to see.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
I plan to join the workforce somewhere in the Pacific Northwest. I want to continue learning new technologies and working hands-on in the field. The long term goal is to become a licensed Professional Engineer and Professional Land Surveyor.

WHAT DO YOU LIKE ABOUT OREGON STATE?
My teachers care about my education, well-being, and success. My classes have real-world examples and applications. I’m supported with opportunities to publish, teach, give presentations, and voice my opinion. I feel like I have an impact in CCE.

WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?
I love Corvallis. There’s lots of tasty food. It’s very walkable and bike-able. The Corvallis city bus service is free. We’re close to the coast and close to the mountains. We’re close enough to Portland and Eugene to do something on the weekend, but far enough to not deal with their traffic. Corvallis has many local activities that make it feel like an active, close-knit community. It’s great all around.

WHAT DO YOU LIKE ABOUT OREGON STATE?
Geomatics is a growing field and the skills are important for so many things. Even if you’re looking at another focus area, the geomatics classes are really accessible and the skills are important for any CCE degree. I may be biased, but the classes are fantastic!
Scope and Objectives

Graduate study in Geotechnical Engineering at Oregon State emphasizes the integration of the science of soil mechanics and the art of foundation and earth structure engineering. Theory is prominent, but it is constantly and critically re-evaluated with respect to its limitations and applicability to the practice of effective geotechnical engineering. Logic, science, and algorithmic thinking are emphasized to equip students with a robust toolbox of problem solving techniques applicable to a wide range of engineering problems, in geotechnical engineering and the broader sciences. The M.S. and M.Eng. programs prepare students for careers in consulting, design, development, regulation, or construction. Additionally, the M.S. program provides the necessary background to pursue the Ph.D. degree for students more interested in research, teaching, or specialization. The Ph.D. program is research intensive and prepares students to be leaders in consulting firms, government agencies, and academic institutions.

The most interesting problems to be faced by the next generation of civil engineers will not be narrowly defined within a single sub-discipline. To that end, the geotechnical engineering program is broadly multidisciplinary in terms of research and education. Geotechnical faculty regularly collaborate with others in CCE – structural, water resources, geomatics, and coastal engineers – and also with faculty from a broad range of other disciplines, including mathematics, physics, materials science, biomedical engineering, oceanography, seismology, forestry, and agricultural economics. This multidisciplinary collaborative spirit extends into the classroom, where professors share their diverse experiences and students are encouraged to take classes from across the school, college, and university.

Sampling of Geotechnical Engineering Courses (Credit Hours)

- CE 514 - Groundwater Hydraulics (3)
- CE 518 - Groundwater Modeling (4)
- CE 570 - Environmental Geotechnics (3)
- CE 571 - Advanced Foundation Engineering (4)
- CE 572 - Advanced Laboratory Testing of Soils (4)
- CE 575 - Earth Retention and Support (4)
- CE 576 - Ground Improvement (3)
- CE 577 - Static and Dynamic Soil Behavior (4)
- CE 578 - Geotechnical Earthquake Engineering (4)
- CE 579 - Slope Stability and Embankment Design (4)
- CE 570 - Unsaturated Soil Mechanics (3)
- CE 570 - Theoretical Geomechanics (3)
- CE 588 - Probability-Based Analysis and Design (4)
- CE 592 - Pavement Structures (3)
WHY OREGON STATE?
I wanted to work on problems that related to liquefaction and earthquake engineering for my master's. Oregon State has produced strong research in this area for years. At Oregon State, I was offered the opportunity to work on a large-scale blasting problem to simulate the response of a field site during an earthquake. This research ultimately led me to choose the university.

HOW DID YOU BECOME INTERESTED IN GEOTECHNICAL ENGINEERING?
I always loved playing in the mud as a child. As I grew older I knew that I wanted to work in a career that featured a lot of field work and many jobs in civil engineering required up to 50 percent field work. I chose general civil engineering as my undergraduate degree, and I did not realize geotechnical engineering was even a career field until my junior year of college. During my undergraduate studies at New Mexico Tech, my professor, Dr. Mehrdad Razavi, acted as my mentor. I took his geotechnical engineering class junior year and immediately remembered one of my favorite childhood pastimes during the laboratory portion of the class. I went on to take every class this professor offered, and his enthusiasm inspired me to do a master’s and pursue this field.

DESCRIBE YOUR CURRENT RESEARCH.
I had the amazing opportunity to work on the large-scale blasting project at the Port of Portland along with a team of other graduate students and professors to simulate the soil response during a seismic event. I was at the field site overseeing drilling, casing installation, and equipment installation. I helped create all of the equipment that got installed into each boring in order to measure the soil’s response before, during, and after blasting. My specific area of research is closely linked with geophysics and involves velocity profiling of the soil profile using downhole, crosshole, seismic cone penetration, and single line seismic surface array techniques. The shear wave velocity profile of the soil indicates the strength of the soil. We captured body wave velocities to show how the strength properties of the soil profile would change before and after a seismic event.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
In July, I will start working at Cornforth Consultants in the Portland area. I hope to be placed on many field assignments in a variety of different projects from seismic design to landslide mitigation.

WHAT DO YOU ENJOY ABOUT OREGON STATE?
I love the faculty and classes. I feel like I have learned a lot. In addition, the gym, workout classes, and dance community have provided me with a good balance to the academics.

ANYTHING ELSE YOU WOULD LIKE TO SHARE WITH PROSPECTIVE STUDENTS?
First term in the geotechnical engineering program is tough. Stick with it. The faculty here are very knowledgeable and involved in their graduate students’ work, and will teach you more than you believe possible.
INFRASTRUCTURE MATERIALS

GRADUATE STUDIES IN INFRASTRUCTURE MATERIALS

SCOPE AND OBJECTIVES

Graduate study in the Infrastructure Materials focus area at Oregon State emphasizes fundamental multi-scale understanding of material properties using experimental and computational methods. Our investigations span time scales from early-age properties to long-term performance. Principles of green construction and materials selection, rehabilitation, assessment and repair of infrastructure are also emphasized. Coursework provides fundamental theory as well as application to real-world engineering challenges.

Research opportunities abound and are supported in the suite of world-class Infrastructure Materials Laboratories. The M.S. and M.Eng. programs prepare students for careers in consulting, design, development, regulation, or construction in the private and public sectors. Additionally, the M.S. program provides the background for students wishing to further their career in academic or industrial research, teaching, or further specialization to pursue the Ph.D. degree.

SAMPLING OF INFRASTRUCTURE MATERIAL COURSES (CREDIT HOURS)

- CCE 520 - Experimental Methods in Cement Chemistry (4)
- CCE 520 - Corrosion and Its Control (4)
- CCE 520 - Condition Assessment, Repair, Rehabilitation of RC Structures (4)
- CCE 520 - ST/Pavement Materials
- CCE 520 - Selected Topics in Infrastructure Materials
- CCE 520 - ST/Advanced Concrete Construction
- CCE 520 - ST/Asphalt and Asphalt Mixture
- CCE 520 - ST/Pavement Design and Sustainability
- CCE 522 - Green Building Materials (3)
- CCE 523 - Concrete Durability (3)
- CE 532 - Finite Element Analysis (4)
- MATS 555 - Experimental Techniques in Material Science (4)
- MATS 570 - Structure Property Relationships (4)
- MATS 584 - Advanced Fracture and Fatigue of Materials (4)
- CE 592 - Pavement Structures
- CE 596 - Pavement Evaluation and Management
- WSE 571 - Renewable Materials in Building Construction (3)
- ST 515 - Design and Analysis of Planned Experiments (3)
STUDENT SPOTLIGHT • YVETTE VALADEZ

HOW DID YOU CHOOSE TO ATTEND OREGON STATE?
I chose Oregon State University because graduate students like myself have access to an infrastructure materials research group that is small yet very impactful and provides scholarly contributions. Many of the ongoing research projects at Oregon State are shedding light on innovative ways to improve our decaying infrastructure.

HOW DID YOU BECOME INTERESTED IN INFRASTRUCTURE MATERIALS?
I became interested in infrastructure materials as an undergraduate research assistant. I helped prepare and cast concrete samples. Over time, I started understanding the multi-faceted factors that influence the condition of these highly consumed, inexpensive materials; such as concrete. As I went on to do other work in traffic design and bridge inspections and maintenance, my interest in concrete further evolved as many of the engineering problems I encountered were rooted in commonly man-made concrete.

DESCRIBE YOUR CURRENT RESEARCH.
I’m currently working on the innovative application of cellulose nanomaterials (CNC) in cement-based materials, such as concrete. CNC are the building blocks of cellulose materials; which help give plants and trees strength and resilience. CNC are considered an abundant, renewable material that can be added to cementitious systems to further enhance these systems’ property development.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
After graduation, I would like to pursue a career in academia or research and development.

WHAT DO YOU LIKE ABOUT OREGON STATE?
The resources and environment are available to have a life balance at home and school. From the availability of physical activity classes to the accessibility to faculty and great research work, I definitely feel that Oregon State is a place for me – and I like that!

WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?
When I have time away from school and research work, I like to go hiking in the McDonald Forest. I have become more active and participate in more outdoor activities since I arrived at Oregon State and I largely attribute this to the community and environment of the university.

A CITY FOR TWO WHEELS
Nearly all of the city’s main roads have designated bike lanes and about 25,000 meters of biking trails run throughout the city limits.

The City of Corvallis is ranked third highest among U.S. cities for bicycle commuters.

A RESEARCH LEADER
Oregon State has earned a worldwide reputation for excellence in teaching and research. This includes the Carnegie Foundation’s highest designation — the classification reserved for universities with “very high research activity.”
GRADUATE STUDIES IN STRUCTURAL ENGINEERING

SCOPE AND OBJECTIVES
Graduate study in the Structural Engineering focus area at Oregon State emphasizes the design of safe and economical structures that meet society’s needs and that can also resist extreme hazards. Oregon State researchers develop modeling tools and investigate the behavior of a number of structural systems: reinforced concrete bridges, cross-laminated timber buildings, steel buildings, and wood residential structures. Examining the effects of a large magnitude, Cascadia Subduction Zone earthquake and the resulting tsunami on Pacific Northwest structures is a growing focus. Several structural engineering students are enrolled in a dual-major program with the Department of Wood Science and Engineering, where structural applications of renewable materials are emphasized.

SAMPLING OF STRUCTURAL ENGINEERING COURSES
CE 527 - Design of Temporary Structures
CE 531 - Structural Mechanics
CE 532 - Finite Element Analysis
CE 533 - Structural Stability
CE 534 - Structural Dynamics
CE 536 - Matrix Methods of Structural Analysis
CE 537 - Nonlinear Structural Analysis
CE 580 - ST / Advanced Steel Design
CE 580 - ST / Advanced Reinforced Concrete Design
CE 580 - ST / Performance-Based Seismic Design
CE 580 - ST / Seismic Design of Steel Buildings
CE 581 - Reinforced Concrete I
CE 582 - Masonry Design
CE 583 - Bridge Design
CE 584 - Wood Design
CE 586 - Prestressed Concrete
CE 588 - Probability-Based Analysis and Design
CE 589 - Seismic Design
WHY OREGON STATE?
Oregon State attracted me for several reasons. I grew up on Long Island, just East of New York City, and attended Cornell University for my undergrad. When applying for grad school, I decided I wanted to see more of the country. For a two-year MS program, why not try living in a different part of the country? The Pacific Northwest attracted me as an outdoorsy, green, mountainous region. I was drawn to the M.S. program for the diverse course material and the opportunity to take on a research project and write a thesis. Oregon State offered me the chance to experience and explore a new and enticing environment both as a student, and as an evolving, curious, and adventurous individual.

HOW DID YOU BECOME INTERESTED IN STRUCTURAL ENGINEERING?
When I was a fifth grader, I had a math teacher who liked to apply mathematical concepts to real life applications. He had us virtually buy houses and pay mortgages, invest our money in stocks, and design houses for families with different handicap requirements. Designing a house in that class set me on a path that eventually led me to structural engineering. After that project, I spent hours laying on my living room floor designing my future houses and my family's vacation house in Cape Cod. I was probably the easiest child to keep entertained at that point, and I'm sure my parents appreciated it while my three siblings kept them busy! Eventually I found myself a senior in high school deciding between architecture and civil engineering. I grew up loving art, math, and science, so it seemed feasible. When I applied to college, I applied to both civil engineering and architecture programs. I had an interview for Cornell and the interviewer actually crossed architecture off of my application, saying I'd be better suited as an engineer! Funny as it is, he was right. I fell in love with the structural program at Cornell, was a dedicated member of the steel bridge project team, and confirmed I was on the right path when I interned in the structural department at McLaren Engineering Group in NYC.

DESCRIBE YOUR CURRENT RESEARCH.
I am working on cathodic protection of steel rebar in existing concrete bridge structures as a continuation of the work done with titanium rebar under Dr. Higgins. The goal is to utilize the additional titanium reinforcement that has been added to resist lateral forces, to also help prevent corrosion of the existing steel rebar. I will be working to reverse the natural direction of the corrosion reaction by forcing the corrosion on the titanium, so we can prevent steel from corroding. Titanium is much more resistant to corrosion and is likely to corrode at a much slower rate than steel, so we hope to maintain the structural integrity of the rebar for as long as possible.

STUDENT SPOTLIGHT • AMANDA SLAWINSKI

A VIBRANT COMMUNITY
Corvallis is a lively community of artists and scholars, and it shows in the cultural events and attractions throughout the town. Tour the art along the Riverfront Commemorative Park or down Madison Avenue. Take a walking tour and see some of the beautiful architecture in the city. Visit the historic Majestic or Whiteside Theaters to take in a play or concert, or stop in to the Arts Center, or one of the many local art galleries, for an art showing.

YOUR PATH TO A CAREER
Graduates of the Oregon State civil engineering program have gone on to work at some of the most prestigious engineering firms in the country and across the world. Alums of the program are currently employed at firms like Jacobs, David Evans and Associates, and KPFF Consulting.
TRANSPORTATION ENGINEERING

GRADUATE STUDIES IN TRANSPORTATION ENGINEERING

SCOPE AND OBJECTIVES

Transportation serves society’s basic needs for personal travel and transfer of goods. Transportation engineering applies scientific and technical knowledge to provide economical and efficient transportation service that meets societal needs while maintaining compatibility with environmental, energy, and safety goals.

Oregon State offers a graduate concentration in transportation engineering leading to the degrees of Master of Engineering, Master of Science, and Doctor of Philosophy. The program promotes collaborative research and provides a state-of-the-art curriculum to help prepare students to be leaders in the industry, providing skills in planning, design, operation, construction, and maintenance of transportation systems and facilities. To meet student goals, the department utilizes interactive classrooms to prioritize student learning outcomes, implements learning environments where students engage in authentic engineering problems, and leverages hands-on learning from field data collection, to software applications, to analytical methods.

The course offerings provide both a broad awareness of transportation concepts and a depth of scientific and technical knowledge to address transportation problems. Required classes for graduate work include traffic operations, facilities design, transportation planning, and statistics. Additional classes on a variety of topics including but not limited to railroads, airports, traffic signals, traffic simulation, highway safety, demand modeling, and pavements are offered as electives through the school. Students are also encouraged to take elective courses throughout other departments and colleges on campus to aid in their professional and research endeavors, including: human factors, public policy, geographic information systems, and applied psychology.

SAMPLING OF TRANSPORTATION COURSES

CE 552 – Isolated Signalized Intersections
CE 554 - Driving Simulation
CE 590 - Transportation Safety Analysis I
CE 590 - Network Flow Analysis and Optimization
CE 591 - Transportation Systems Analysis and Planning
CE 592 - Pavement Structures
CE 593 - Railroad Engineering
CE 593 - Traffic Flow Analysis and Control
CE 595 - Traffic Operations and Design
CE 597 - Public Transportation
CE 598 - Airport Planning and Design
CE 599 - Intelligent Transportation Systems
STUDENT SPOTLIGHT • ALIREZA MOSTAFIZI

WHY DID YOU CHOOSE TO ATTEND OREGON STATE?
What attracted me the most was the variety of the research that transportation faculty were involved with here at Oregon State. I wanted to work on multidisciplinary projects focusing on connected and autonomous vehicles that bridge the gap between computer science, robotics, and transportation. Dr. Wang’s research seemed to be a perfect match. Plus, I was offered funding for my studies, which was a very important factor for me. In addition, the Driving and Bicycling Simulator that we have here is one of the best in the U.S., and there is amazing behavioral research that is being conducted by Dr. Hurwitz and his team using these facilities.

HOW DID YOU BECOME INTERESTED IN TRANSPORTATION ENGINEERING?
I got interested in transportation-related problems in one of my classes in college, and I was immediately drawn to the complexity of the issues, and how they can be approached from other perspectives that I had barely thought of before. My robotics background from high school helped me realize that innovative transportation technologies, such as self-driving cars, might be where my interests meet.

DESCRIBE YOUR CURRENT RESEARCH.
I’m currently working on two different lines of research. My main research interest stems from analyzing the impact of emerging connected and autonomous vehicle technologies on the mobility and safety of our transportation systems. For instance, I look into how different applications of self-driving cars can reduce our travel times, and I devise new methods for these applications to be implemented in the future development and deployment of such technologies. My second line of research focuses on natural disasters, particularly near-field tsunami, evacuation. This research aims to improve the evacuation efficiency on the coast of Oregon in any possible way. For example, by analyzing the impact of social, behavioral, and physical characteristics of the people in the evacuation process; or by introducing vertical evacuation sheltering possibilities in the community, we’re working to minimize the risk of natural disasters.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
I still haven’t decided if I want to stay in academia or work in industry, but I do know that I want to work in research and development of self-driving vehicles, and in general, the concept of smart cities.

WHAT DO YOU LIKE ABOUT OREGON STATE?
Excellent research quality is specifically one of the greatest strengths of Oregon State. The abundance of intelligent faculty members and students, as well as tons of resources and opportunities pave the way for fruitful collaborations, and as a result, making incredible products.
GRADUATE STUDIES IN WATER RESOURCES ENGINEERING

SCOPE AND OBJECTIVES

The graduate program in Water Resources Engineering at Oregon State emphasizes interdisciplinary research and education on emerging themes related to groundwater hydrology, watershed hydrology, stormwater, floods and droughts, water infrastructure, food-energy-water nexus, hydroinformatics, water resources systems analysis, and adaptation to climate change. The instructional program aims at developing strong abilities to conduct engineering work involving basic concepts and principles, technical analysis, planning, design and management.

PROGRAM OF STUDY

Students develop their study programs from a variety of courses in civil engineering and other departments and programs across Oregon State. Civil Engineering departmental courses typically form the major field of study. Supporting course work from other departments and programs is encouraged because of the breadth of the water resources engineering field and to take advantage of strong supporting programs in many natural resources departments on campus.

The major field usually consists of a core of course work in surface and groundwater hydrology, hydraulic engineering, water quality, stormwater management, river engineering, and water resources systems analysis. This is complemented by studies in a selected field such as environmental engineering, geotechnical engineering, bioresource engineering, forest hydrology, stream ecology, geomorphology and geology, and resource economics, as well as many other possibilities. Students consult with their advisor to develop study programs that fit their academic and professional goals.

SAMPLING OF WATER RESOURCES COURSES

CE 512 - Hydrology
CE 513 - GIS in Water Resources
CE 514 - Groundwater Hydraulics
CE 517 - Hydraulic Engineering Design
CE 525/CE 540 - Stochastic Hydrology
CE 540 - Selected Topics: Stormwater Design and Management
CE 540 - Selected Topics: Optimization in Water Resources Engineering
CE 544 - Open Channel Flow
CE 547 - Water Resources Engineering I: Principles of Fluid Mechanics
WHY OREGON STATE?
I attended Oregon State for the entirety of my undergraduate career, and that was more than enough to sell me on applying to the graduate program here. Not only because of the innovative research happening here, but also the great professors, students, and staff within the School of Civil and Construction Engineering.

HOW DID YOU BECOME INTERESTED IN WATER RESOURCES ENGINEERING?
Water is a vital resource, which is becoming increasingly scarce. I became interested in the field as I learned about the complex issues surrounding water, and the benefits effective water management can provide.

DESCRIBE YOUR CURRENT RESEARCH.
My research is focused on developing various surface and groundwater models surrounding Hermiston, Oregon, and integrating the models into a decision support system. My work is part of a large interdisciplinary team, with the goal of providing the region with a tool to aide in resiliency and adaptation planning. This tool aims to show the impacts of various decisions and the resulting interdependencies between different individuals, to ultimately promote collaborative problem solving between within the basin.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
I have not decided between teaching and entering the private/public sectors. However, whichever path I choose, it is important to me that I am able to approach my work in a research-based, problem-solving style of work.

WHAT DO YOU LIKE ABOUT OREGON STATE?
Oregon State is located in a great community and state. The resources on campus combined with the overall atmosphere make me glad I chose it.

STUDENT SPOTLIGHT • NICHOLAS A. GILES

COLLABORATIVE EXCELLENCE
At Oregon State, over 125 faculty teach and conduct research in areas related to fresh water supply and quality. These faculty members are spread among six colleges and represents many different academic disciplines – including engineering, ecology, geosciences, social sciences, economics and arts.

The Institute for Water and Watersheds is the hub for this diverse water research community. It seeks to solve complex water issues by facilitating integrative water research.

A DYNAMIC CULTURAL LANDSCAPE
Among the many cultural opportunities and resources in Corvallis is the Corvallis Multicultural Literacy Center (CMLC). The center is a self-sustaining community-based learning center where individuals and families of all cultures come together to share, mentor, and understand cultural literacies, to access resources, and to build a cohesive community in a safe, welcoming environment.

The center is conveniently located in the heart of the city, emphasizing that it is a gathering place for people from all over the community. For more information, visit cmilcenter.org.
RESEARCH AND FACILITIES

COASTAL AND OCEAN ENGINEERING

The Coastal and Ocean Engineering program at Oregon State is a leading center for research and education in coastal engineering and nearshore science, in which world-class faculty and staff specialize in physical/numerical modeling of coastal dynamics and field observations. A short list of focus areas includes: nearshore hydrodynamics, tsunami propagation and storm surge, remote sensing of nearshore waves and currents, turbulent sediment suspension and transport, and wave-structure interaction.

The Coastal and Ocean Engineering program is also the home of the O.H. Hinsdale Wave Research Laboratory (HWRL) and the Edwards Nonlinear Wave Lab. The HWRL is one of the largest and technically most advanced laboratories for coastal research in the world and contains the Directional Wave Basin and the Large Wave Flume. Through a National Science Foundation (NSF) award in 2015, two main resources at the HWRL become part of a distributed, national program – the Natural Hazards Engineering Research Infrastructure – that provides the natural hazards engineering community with access to various research infrastructure, as well as educational and community outreach activities.

The ties between Coastal and Ocean Engineering and the HWRL ensure students will have access to state-of-the-art facilities for research in coastal and ocean processes. In addition, since complex coastal problems require multidisciplinary solutions, Coastal & Ocean Engineering has ties to programs in Geosciences, Marine Geology, Physical Oceanography, Mathematics, and Computer Science.

DIRECTIONAL WAVE BASIN

The Directional Wave Basin is designed as a shared-use facility to understand the fundamental nature of tsunami and hurricane wave/surge hazards, including inundation to improve our numerical tools for coastal hazard mitigation, overland flow through the built and natural environment, fluid-soil-structure loading and response, debris impact, erosion and scour, natural and nature-based mitigation, and harbor resonance.

In addition to coastal hazards research, the facility is used for general testing of coastal infrastructure, for nearshore processes research, and for testing marine renewable energy devices.

LARGE WAVE FLUME

The Large Wave Flume is the largest of its kind in the US. Because of its size and ability to operate in high Reynolds regimes, the flume is ideally suited for: scaled shallow water hurricane and storm wave conditions, long wave and tsunami generation. It features an active wave absorption compensation system for reflected waves, which also minimize tank seiching in long duration studies.

EDWARDS NONLINEAR WAVE LAB

With the aid of the NSF support, a new water tank was completed in 2006. This apparatus was designed and constructed specifically for precision experiments for water-wave-mechanics with optical instruments. This tank enables us to measure wave and velocity fields from every angle using various optical techniques for flow visualization, as well as laser-Doppler anemometer (LDA) and particle-imagery velocimetry (PIV) systems.

CONSTRUCTION ENGINEERING

Construction Engineering research at Oregon State focuses on alternative contracting techniques, risk management, construction safety, sustainability, accelerated and durable construction, construction materials, and enterprise management. Over the past several years, Construction faculty have led or participated in research sponsored by the Construction Industry Institute (CII), National Cooperative Highway Research Program, the Oregon Department of Transportation (ODOT), The Center for Construction Research and Training, ELECTRI International, Pacific NW Transportation Consortium, and the National Institute for Occupational Safety and Health.

CONSTRUCTION SAFETY RESEARCH LABS

Construction safety research is conducted both in on-campus laboratories and on construction sites. For work zone safety research, the Oregon State Driving Simulator Lab provides an opportunity to model construction work zones within an interactive environment. The simulator allows for studying the interaction between passing traffic (driver behavior) and construction operations to examine worker exposures to safety hazards and safety performance of traffic control measures. For research on construction safety related to temporary and permanent structures, the CCE structures lab, and the Wood Science and Engineering (WSE) structures lab, are available for use. Given the complex, large-scale, and unique nature of construction projects, safety research is also conducted on construction sites and in architecture/engineering/construction offices located throughout Oregon and the Pacific Northwest to monitor and record work practices, worksite conditions, and worker behavior in actual, real-world settings.
RESEARCH AND FACILITIES

CONSTRUCTION ENGINEERING RESEARCH LABS
Multiple labs across the Oregon State campus provide the opportunity to conduct high-level and full-scale construction engineering research related to structures and materials. Civil and Construction Engineering and Wood Science and Engineering have multiple structures and materials labs available for use. For construction issues related to structures, the CCE and WSE structures labs provide the ability to model and test structures constructed of concrete, steel, wood, and other materials. Laboratories for materials testing include the Concrete Performance Lab, Kiewit Materials Performance Lab, and Green Building Materials Lab. Each lab is equipped with state-of-the-art technologies capable of conducting a wide range of research on the performance and impacts of materials used for construction. Additionally, construction sites located throughout Oregon and the Pacific Northwest are utilized to study construction operations, temporary structures, and construction materials in use.

FIELD DATA COLLECTION RESOURCES
In addition to the equipment available in the labs, our research capabilities are supported by a wide variety of equipment for field research. The equipment is selected to allow for the collection and analysis of multiple types of data associated with construction research.

GEOMATICS
The Civil Engineering Geomatics program at Oregon State is a leading center for research and education in geomatics applied to civil engineering and other fields. Our students also collaborate with researchers in a wide variety of disciplines. A short list of focus areas includes: 3D laser scanning/lidar, Geographic Information Systems, Geospatial Hazard Analysis, GPS/GNSS positioning, Atmospheric monitoring with GNSS, height modernization with GNSS, Cadastral Surveys, UAVs, UAV remote sensing, geospatial data management, and geomatics computation and programming.

GEOMATICS LABORATORY
Oregon State has access to a large amount of state-of-the-art equipment and software thanks to a memorandum of understanding between Oregon State, Leica Geosystems, and David Evans and Associates, Inc. This provides students with access to high-end, modern, Leica Geosystems Survey equipment. Students will be trained on the latest equipment available in industry practice. Leica has provided powerful software packages (Leica Geo-Office and Cyclone), which are used in Oregon State’s courses for survey and scan data processing. Maptek I-Site also provides licenses to Oregon State for I-Site Studio. QCoherent LP360 is also available for lidar data processing and analysis.

3D LASER SCANNING
Oregon State owns and operates Two Leica ScanStation2 laser scanners, a Riegl VZ-400 terrestrial laser scanner, and a NextEngine Micron resolution structured light system. In addition, Oregon State partners with Leica Geosystems and David Evans and Associates to use state-of-the art Leica scanners, as needed. Oregon State has access to a variety of software to work with 3D point clouds including Leica Cyclone, Maptek I-Site, the Terrasolid suite, and LP260. We also write a substantial amount of custom code for efficient and reliable point cloud processing.

SURVEY EQUIPMENT
Thanks to Leica and DEA, Oregon State has ten Leica Viva Series TS 15 P Robotic Total Stations, five of which have smart station capabilities with GNSS. In addition, there are several Leica DNA-03 and DNA-10 digital levels along with both sectioned fiberglass and single piece invar rods allowing for 1st, 2nd, or 3rd order work to be carried out.

UNMANNED AIRCRAFT SYSTEMS
The geomatics group has two DJI multicopters for performing remote sensing. These systems are capable of flying up to 18 minutes on a single battery, provide first-person view video, and can be programmed to follow photogrammetric flight paths. Oregon State also has Agisoft Photoscan for generating 3D models and point clouds from the images. Recently, Oregon State purchased the Sensefly eXom, a professional UAS designed for inspecting structures.

GPS/GNSS
Oregon State has 5 Leica GNSS receivers, a Trimble R8 GNSS receiver with a wifi hotspot to connect to Oregon’s RTK network as well as equipment to setup a GPS base station for differential and RTK GPS.

COMPUTING LABS
In addition to the computing labs offered by CCE, Oregon State Civil Engineering Geomatics has two dedicated computing labs. A graduate lab contains 10 high power graphics workstations (Quad
RESEARCH AND FACILITIES

Core processors, 24+ GB RAM, 1GB+ dedicated video RAM) with dual monitors for processing lidar data. These computers are equipped with the latest in lidar, GIS, and other geomatics software. The Photogrammetry Lab contains several computers with ERDAS Imagine software.

GEOTECHNICAL

Geotechnical engineers help design structures that are either composed of soil or rock or are in contact with it – that is, they engineer the interface between the natural and built environments. Their research provides insight into the performance of structures in contact with earth, such as bearing failures, settlement damage, and failures due to emergent processes such as landslides and liquefaction. Scott Ashford, dean and Kearney Professor of Engineering; Matt Evans, associate professor of geotechnical engineering; Ben Leshchinsky, associate professor of geotechnical engineering; Ben Mason, associate professor of geotechnical engineering; and Armin Stuedlein, associate professor of geotechnical engineering form the core of the geotechnical engineering research program at Oregon State.

GEOTECHNICAL FIELD RESEARCH SITE

The Geotechnical Engineering Field Research Site at Oregon State provides researchers, engineering practitioners, and contractors with a well-characterized site for research and product testing. The site was established in 1997 with the first round of extensive geotechnical and geophysical investigations.

The site is flat, open, and free of overhead obstructions. The working area available for field testing or fabrication of models is approximately 180 m × 120 m. The site has easy access for testing and construction equipment, adjacent city water supply, and nearby power and wireless network access. The soils are predominantly over-consolidated fine-grained materials with a depth to bedrock of about 30 m; groundwater fluctuates between 1.5 m and 2.5 m below ground surface.

Representative examples of full-scale testing at the test site include the evaluation of:
- construction and quality assurance testing of drilled shaft foundations;
- static and cyclic response of helical anchors;
- effect of mechanically-stabilized earth (MSE) wall reinforcement strip spacing on pullout resistance;
- torsional load transfer of drilled shafts;
- effect of seasonal groundwater fluctuation on performance of spread footings resting on aggregate piers;
- effect of proximity of piles to slopes on lateral capacity; and
- geophysical methods for measuring the shear wave velocity of soils.

GEOTECHNICAL RESEARCH LAB

The Geotechnical Research and Teaching Laboratories were completely renovated in 2013. These labs are well-equipped for the complete characterization of the engineering properties of soils, including index properties, compaction characteristics, hydraulic conductivity, compressibility, rate of consolidation, quasi-static shear strength, cyclic shear strength, and thermal properties (conductivity and specific heat capacity).

Element-scale testing capabilities range from fundamental to sophisticated for both teaching and research. Of note is the infrastructure for characterization of liquefiable soils, including cyclic triaxial and cyclic simple shear devices. Large load frames and triaxial cells facilitate the measurement of stress-strain-strength properties of crushed rock and coarse aggregate. Studies of complex soil behavior are facilitated by advanced electronics and innovative laboratory techniques, including optical microscopy, propagation of elastic waves, acoustic emissions monitoring, and thermal properties characterization.

GEOTECHNICAL COMPUTING RESOURCES

The Geotechnical Engineering Group maintains a large library of software for simulation of a variety of complex multiphysics problems with geotechnical applications. There is active research in discrete element method modeling (PFC, LAMMPS), finite element method modeling (ABAQUS, ANSYS, Comsol, Plaxis, GeoStudio), finite difference modeling (FLAC), and limit analysis (LimitState:GEO, Optum:G2) in the group. The software is installed on modern multicore workstations, high throughput servers, and computer clusters for access by students and faculty either on their desktops or through the cloud.

INFRASTRUCTURE MATERIALS

Infrastructure Materials Research in CCE at Oregon State focuses on cement-based materials, alternative cements, asphalt, metals and innovative materials and systems. Our research spans multiple scales from nano to macro and time horizons from early-age to long-term properties. We combine fundamental scientific and engineering investigations with computational modeling and
RESEARCH AND FACILITIES

predictive tools to provide real-world solutions. We are funded by a wide range of sources including NSF, DOD, Departments of Transportation, University Transportation Centers and wide-ranging Industry collaborations. Research is done across a suite of unmatched facilities in North America. We operate in four different laboratories including the Concrete and Asphalt Performance Lab, the Kiewit Materials Performance Lab, the O.H. Hinsdale Wave Research Laboratory and the Green Building Materials Lab. We also have an extensive outdoor exposure site for bench-marking accelerated laboratory investigations to real environmental exposure. Work is accomplished by a team of professors and post-doctoral researchers as well as outstanding graduate and undergraduate research assistants.

CONCRETE PERFORMANCE LAB

Research at the Concrete Performance Lab focuses on the prediction of long-term durability and characterization of early-age volume change of cement-based materials. Our multi-scale approach results in translational research that combines fundamental scientific understanding with the improvement and development of test methods and specifications that enhance concrete performance. We are recognized experts in concrete durability, namely alkali-silica reaction, early-age properties of calcium aluminate cements and prediction of cracking risk in high performance concrete. Concrete is the most used building material in the world. While new materials may show promise, they are often made from natural resources that are not found in quantities to compete or even replace concrete. It is for this reason that concrete is the most advantageous for further development. Enhancements to concrete achieve superior performance may be a central path forward to ensure both long-term durability and sustainability. These avenues are central to our research at Oregon State.

KIEWIT MATERIALS PERFORMANCE LAB

Kiewit Materials Performance Lab was designed to carry out sensitive bench-scale experiments to characterize various types of materials and investigate their deterioration mechanisms. Materials of interest involve cement/concrete, metals, alloys, polymers, coatings, asphalt and wood. The laboratory is equipped with grounded bench-top space, two high-performance fume hoods, an environmental test chamber, cyclic corrosion test chamber, isometric calorimeter, thermogravimetric analyzer (TGA), and electrical and electrochemical testing equipment (including potentiostats/galvanostats and FRAs for AC Impedance analysis). Among many other capabilities, the laboratory is also fully equipped to conduct sensitive electrochemical investigations to study corrosion phenomena in metals/alloys and to study performance and durability of coatings and composite materials.

GREEN BUILDING MATERIALS LAB

The Oregon BEST Green Building Materials Laboratory includes research activities from the Schools of Chemical, Biological and Environmental Engineering and Civil and Construction Engineering and the Department of Wood Science and Engineering. Equipment housed in this Oregon BEST Signature Laboratory will allow Oregon State researchers to characterize, develop and test high performance sustainable materials for a wide variety of applications including buildings and transportation infrastructure. It also enables Oregon State to continue to recruit top faculty, researchers and students to the Oregon State campus.

PAVEMENT STRUCTURES AND MATERIALS LABORATORY

The Pavement Structures and Materials Laboratory is equipped to conduct modeling and testing in several areas of pavement technology including asphalt binder and mixture characterization, aggregate characterization, asphalt mix and structural design, concrete materials testing, and concrete pavement design. Research conducted at the Pavement Structures and Materials Lab encourages the use of more sustainable pavement materials, such as permeable pavements, rubber asphalt, warm-mix asphalt technologies, recycled asphalt pavements, recycled concrete, and alternative cement binders. The lab is also equipped with computational modeling tools to investigate possible applications of pavement design strategies that can have a considerable impact on fuel consumption, vehicle maintenance costs, greenhouse gas (GHG) emissions, and lifecycle costs. The laboratory enables researchers to develop research programs to study pavement materials at both the applied and basic research levels.

STRUCTURAL

While all members of the Oregon State structural engineering faculty have an interest in structural analysis and seismic related issues, Dr. Higgins and Dr. Miller specialize in design and experimental studies; Dr. Liu explores resilient steel structures, with a focus on seismic and disproportionate collapse resistance; Dr. Scott and Dr. Yim emphasize structural mechanics, analysis, and dynamics, as well as numerical modeling of fluid-structure interaction; Dr. Barbosa specializes in laboratory testing and probabilistic methods of risk and reliability applied to engineering problems; and Dr. Fischer seeks innovative approaches to improve community resilience and the robustness of infrastructure affected by earthquakes and fires. In recent years, structural engineering research projects have been supported by the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST), the United States Department of Agriculture (USDA), the Office of Naval Research (ONR), the Oregon Department of Transportation (ODOT), the California Department of Transportation (Caltrans), and the Pacific Earthquake Engineering Research Center (PEER). Collaborative work has been conducted with researchers at Lehigh University, Cornell University, Tufts University, the Transportation Ministry (Japan), the Tokyo Institute of Technology, the University of Rome (La Sapienza), and several other universities in Europe and Asia.

STRUCTURAL ENGINEERING LABORATORY

Many structural engineering research projects utilize Oregon State’s large scale strong floor and 160-foot high strong wall located in the O.H. Hinsdale Wave Research Laboratory. The strong floor is the second largest in the Western U.S. and allows researchers to simulate forces of up to one million pounds on frames up to two stories high. Additionally, the laboratory has a large scale environmental chamber and a 4-by-4-foot shake table. The facility has recently been used for studies of bridge cracking that have been undertaken on behalf of the Oregon Department of Transportation. Of the state’s 1800 bridges constructed in the 1950s, 500 have been identified as cracked. Replacement and repair costs could cost several billion dollars; however, a testing program at Oregon State led to economical repair prioritization strategies. In addition, the facility has been used on projects related to high strength steel materials for use in bridges and buildings, testing of full-scale bridge gusset plates, as well as...
RESEARCH AND FACILITIES

Building structural components, such as URM walls. Oregon State researchers are developing modeling tools and databases to forecast how the built infrastructure will perform over time, assess structural reliability, and identify cost-effective repair options for our aging infrastructure.

WOOD STRUCTURES LAB
Most of the experimental research related to wood structures is conducted at the Gene D. Knudson Wood Engineering Laboratory in the Oregon State Department of Wood Science and Engineering (WSE). The 3,000-square-foot high-bay facility has a 12-foot high L-shaped reaction wall and a 60-by-40-foot reaction floor to accommodate dynamic testing of large wood components and structural systems. Many graduate students are involved in dual-major Master of Science or Doctor of Philosophy degree programs in CE and WSE.

TRANSPORTATION
Transportation research at Oregon State can be divided into two broad interest areas: 1) traditional transportation engineering (e.g., transportation planning, design, operations, and safety) and, 2) pavement design and pavement materials.

Significant funding comes from various state, regional, and federal sources such as the Federal Railroad Administration, National Cooperative Highway Research Program, National Institute of Disability and Rehabilitation Research, National Science Foundation, Oregon Department of Transportation, US Department of Education, the Pacific Northwest Transportation Consortium (PacTrans), Sea Grant, and the Transit Cooperative Research Program as well as private industry.

DRIVING AND BICYCLING RESEARCH LAB
Researchers affiliated with the laboratory are concerned with studying transportation operations and safety issues from a multi-modal perspective. Due to the complexity of transportation problems, research conducted in the laboratory is interdisciplinary and requires expertise in transportation engineering, human factors, cognitive psychology, and statistics, among others. The laboratory is an experimental tool which can help uncover the explanatory mechanisms of transportation user behavior, leading to improvements in the safety and operations of transportation systems.

The high fidelity driving and bicycling simulators allow researchers to evaluate many more scenarios than would be practically possible in the field or on an instrumented test track while at the same time controlling for extraneous variables. As a result, drivers and bicyclists can be exposed to risky scenarios that would be either very difficult or impossible to evaluate in the real world or on a test track. The bicycling simulator is one of only a few in the world, and can operate simultaneously with the driving simulator in the same virtual environment. Mobile eye tracking is used in conjunction with both simulators and in the field to evaluate the visual attention of transportation users.

CENTER FOR ACCESSIBLE TRANSPORTATION
At Oregon State, the Center for Accessible Transportation (CAT) conducts research and development projects that concentrate on accessibility and cost-effective improvements in transportation technologies, with the goal of making transportation safer and more dignified for all. The projects focus on accessible air, rail and urban transportation. The CAT laboratory is fully accessible and is used for research, development and testing of new technologies and equipment. The laboratory is equipped with a range of wheeled mobility devices, and is also the permanent home of the test dummy family. CAT has 50th and 90th percentile male test dummies, and a 50th percentile female that are used for the biomechanics research.

COGNITION AND LEARNING LABORATORY
This lab is used for the identification and categorization of student misconceptions and knowledge of practicing engineers and for the development, implementation and testing of educational interventions to both overcome misconceptions and prepare students for the engineering workforce. The lab is outfitted with state of the art video and audio recording and teaching and learning.

WATER RESOURCES
The faculty in the Water Resources Engineering program is actively involved in a wide range of research activities dealing with problems in groundwater hydrology and contamination, river hydraulics and water quality, watershed hydrology and management, green stormwater infrastructure, coastal and inland flooding, water resources systems analysis, food-energy-water nexus, climate change impact studies, and hydroinformatics. These research areas are led by Jack Istok, professor of water resources engineering and Meghna Babbar-Sebens, associate professor of water resources engineering. Their work is augmented by emeritus faculty members Wayne Huber and David Bella, and instructor Tracy Arras.
RESEARCH AND FACILITIES

Water resources faculty have traditionally been heavily allied with other water-oriented faculty around the Oregon State campus, including engineers and scientists in Biological and Ecological Engineering, Forest Engineering, Geosciences, Crop and Soil Science, and elsewhere. The university is widely recognized for its integrative and interdisciplinary activities in water resources.

GREEN STORMWATER INFRASTRUCTURE RESEARCH FACILITY
Oregon State-Benton County Green Stormwater Infrastructure Research (OGSIR) Facility is a three-celled stormwater research facility for field-scale experiments and testing on green stormwater infrastructure. The cells provide the ability to test various stormwater treatment technologies and treatment of various stormwater contaminants. These cells are also instrumented with multiple sensors to enable better data collection and modeling.

Pollutants captured at this facility include tractor leaks, fuel tank spills, raw asphalt, road fill sediment, parking lot sediments and chemicals, and road paint spills. In addition to stormwater treatment, this facility supports long term research on stormwater quality to inform current and future projects for treating stormwater using ‘low impact development’ technology.

The lab is a partnership project to enhance water quality, provide long-term research and support stormwater and water quality education and outreach. Partners in the project include Benton County, Oregon State, Oregon BEST, State of Oregon Water Resources Department, and the Pacific Northwest Transportation Consortium.

GROUNDWATER RESEARCH LAB
The Groundwater Research Laboratory, located in the Oak Creek Building on the Oregon State campus, is involved in groundwater testing and research with an emphasis on clean-up of sites contaminated by radionuclides and chlorinated solvents. The lab, which features sophisticated equipment to detect a wide variety of contaminants in groundwater, concentrates on in situ aquifer characterization technologies, including the novel single-well “push-pull” method.

MULTIPURPOSE RIVER HYDRAULICS RESEARCH FACILITY
The MRHRF features a recirculating system with the ability to test two simultaneous and independent experiments with flows of up to 35 cubic feet per second. The facility is ideal for the construction and testing of river and low head pressurized hydraulic structures, and it can also be used for a wide range of research projects, including flood control, reservoir sedimentation, density currents, erosion and scour, aquatic habitat, stream restoration, fish passage and dam removal.

The $600,000 facility consists of a re-circulating system with a 20-m x 8-m concrete slab (platform for experiments), two independent head tanks, a sediment catchment, a clean water sump, pumps, and impulsion and return pipe lines. Partners for the lab include the United States Environmental Protection Agency, Oregon BEST, Oregon State, and Northwest Research Associates.

INSTITUTE FOR WATER AND WATERSHEDS
At Oregon State, over 125 faculty teach and conduct research in areas related to fresh water supply and quality. These faculty members are spread among six colleges and represents many different academic disciplines – including engineering, ecology, geosciences, social sciences, economics and arts. Oregon State also hosts a vibrant Water Resource Graduate Program where students can earn specialized degrees in water resources engineering, science, and policy and management.

The IWW is the hub for this diverse water research community. It seeks to solve complex water issues by facilitating integrative water research.
OREGON STATE UNIVERSITY - GRADUATE STUDIES
SCHOOL OF CIVIL AND CONSTRUCTION ENGINEERING

CIVIL AND CONSTRUCTION ENGINEERING FACULTY

INGRID AROCHO
Assistant Professor
Construction
RESEARCH: Dr. Arocho’s research interests include construction equipment fleet management, pollution production during construction activities, and construction methods improvement to reduce environmental impact. Her previous research included the estimation and forecasting of pollution emissions from construction equipment fleets.

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SCOTT ASHFORD
Dean, College of Engineering
Kearney Professor of Engineering
Geotechnical
RESEARCH: Dr. Ashford’s research focus is enhancing public safety and reducing potential economic loss worldwide from earthquake and coastal hazards. He performs trans-disciplinary work in earthquake and coastal engineering, focusing on full-scale modeling of soil-foundation-structure interaction, seismic site response, coastal erosion, and slope stability. His latest efforts are targeted at improving the resilience of the lifeline systems in the Pacific Northwest to better withstand earthquakes and tsunamis created by the Cascadia Subduction Zone.

CONTACT: scott.ashford@oregonstate.edu

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Construction
RESEARCH: Dr. Arocho’s research interests include construction equipment fleet management, pollution production during construction activities, and construction methods improvement to reduce environmental impact. Her previous research included the estimation and forecasting of pollution emissions from construction equipment fleets.

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SCOTT ASHFORD
Dean, College of Engineering
Kearney Professor of Engineering
Geotechnical
RESEARCH: Dr. Ashford’s research focus is enhancing public safety and reducing potential economic loss worldwide from earthquake and coastal hazards. He performs trans-disciplinary work in earthquake and coastal engineering, focusing on full-scale modeling of soil-foundation-structure interaction, seismic site response, coastal erosion, and slope stability. His latest efforts are targeted at improving the resilience of the lifeline systems in the Pacific Northwest to better withstand earthquakes and tsunamis created by the Cascadia Subduction Zone.

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TRACY ARRAS
Senior Lecturer/Lower Division Coordinator
Geomatics
RESEARCH: Dr. Arras’ technical interests are principally in the area of geographical information systems and the integration of geomatic technologies (remote sensing, image processing, and GPS) for engineering applications. Technical interests also include the development of new innovative and effective pedagogic approaches (e.g., use of information technology and connectivity) to engage freshman and sophomore students. Her teaching interests include introductory GIS, GIS and Water Resources, and introductory freshman and sophomore courses that utilize information technology.

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MEGHNA BABBAR-SEBENS
Associate Professor
Water Resources
RESEARCH: Dr. Babbar-Sebens’ research interests lie in the area of Hydroinformatics, which employs simulation modeling, and information and communication technologies to help solve problems in hydraulics, hydrology and environmental engineering for better management of water-based systems. Examples of specific research applications include: Monitoring and modeling of urban green infrastructure for stormwater management; Web-based participatory design of conservation practices in watersheds; Advanced optimization algorithms and approaches for adaptation planning in presence of uncertainty, multiple objectives, and multiple stakeholders.; Data assimilation in water quality models using multiple sensors (e.g., in-situ instruments, satellites, and unmanned aerial systems (UASs), etc.)

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CIVIL AND CONSTRUCTION ENGINEERING FACULTY

ANDRE BARBOSA  
Associate Professor  
Structural  

RESEARCH: Dr. Barbosa’s research focuses on the development of experimental testing programs and numerical tools and techniques geared towards improving structural performance and resilience of the built environment to multiple hazards. Studied within the group are earthquakes, fire, and tsunami hazards. Structural materials which are addressed are reinforced concrete, timber, and steel.

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SHANE BROWN  
Associate Professor  
Transportation, Engineering Education  

RESEARCH: Dr. Brown’s research interests are in cognition and learning, with a particular emphasis on conceptual change and situated cognition. His conceptual change research examines why concepts are harder to learn than others and how to develop environments that facilitate understanding. His situated cognition research explores differences in ways of knowing and how core concepts are used in engineering practice.

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ERDEM COLERI  
Assistant Professor  
Infrastructure Materials, Transportation  

RESEARCH: Dr. Coleri’s research interests are in the areas of sustainable pavement materials and structures, energy efficient pavement design strategies, and infrastructure health monitoring using wireless sensor networks. The major objective of his research group is to develop methods and technologies to construct pavement structures that are more cost effective, socially beneficial, and does less damage to the environment. Main current research projects include i) modeling and measuring excess vehicle fuel use due to pavement structural response; ii) asphalt pavement layer adhesion through tack coats; iii) adjusting asphalt mixes for increased durability; iv) improving performance of recycled asphalt pavement mixes.

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DANIEL COX  
Professor  
Coastal and Ocean, Engineering Education  

RESEARCH: Dr. Cox’s research focuses on coastal engineering, including mitigation of coastal hazards stemming from hurricanes and tsunamis. His research includes wave/surge interaction with the built and natural environment; tsunami evacuation planning; wave impact forces on coastal structures; wave attenuation by vegetation; and coastal sediment transport.

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T. MATTHEW EVANS  
Associate Professor  
Geotechnical, Engineering Education  
RESEARCH: Dr. Evans' research interests include granular mechanics, soil behavior, image analysis, numerical methods, and unsaturated soil mechanics, with applications to renewable energy, multiphysics problems, waste isolation, and sustainable infrastructure. His work is broadly multidisciplinary and has relevance to fields such as materials handling, pharmaceuticals, biomechanical engineering, physics, and geology.  
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JOHN GAMBA TESE  
Professor  
OEG Faculty Fellow  
Construction  
RESEARCH: Dr. Gambatese’s technical and research interests include: construction safety, constructibility, sustainability, design-construction interface, lifecycle properties of constructed facilities, temporary construction structures, and construction engineering. He has conducted research on a variety of topics including: construction safety and health, designing for safety, constructibility, innovation in the construction industry, construction automation, alternative contracting methods, and sustainability.  
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ERICA FISCHER  
Assistant Professor  
Structural  
RESEARCH: Dr. Fischer’s research interests revolve around innovative approaches to improve the resilience of communities and robustness of structural systems and lifeline infrastructure affected by earthquakes and fires. This includes researching performance-based design approaches of structural systems to promote more sustainable designs. These research interests are implemented through both large-scale experimental testing and numerical modeling approaches.  
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MERRICK HALLER  
Associate Head of Graduate Affairs  
Professor  
Coastal and Ocean  
RESEARCH: Dr. Haller’s teaching interests include hydraulics, wave mechanics, coastal engineering, and graduate writing. Much of his present research interest is related to the remote sensing of wave transformation processes, especially those processes that lead to hazardous wave conditions, wave breaking, and rip currents. Other efforts are related to interaction between waves and wave energy converters and quantifying the physical effects of wave energy arrays.  
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JOE FRADELLA  
Senior Instructor  
Hoffman Instructor  
Construction  
RESEARCH: Prior to Oregon State, Mr. Fradella worked as a construction project manager where projects included historic building restoration and conservation, retaining walls and hardscape work. During his career, he has worked for several engineering and construction firms, primarily focusing on mechanical and electrical systems. His research interests include energy efficiency and construction safety.  
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SALVADOR HERNANDEZ  
Assistant Professor  
Transportation  
RESEARCH: Dr. Hernandez is recognized nationally and internationally in the area of transportation safety and transportation network modeling. His current areas of research interest are: Transportation safety modeling of all modes encompassing crash countermeasures, crash and safety analysis, and statistical modeling; Use of large scale disaggregate data sets for developing strategic, tactical, and operational models and solution methods for problems that arise in the multidisciplinary and interdisciplinary areas of transportation systems. Dr. Hernandez is also interested in behavioral issues in natural disasters such as in earthquakes, travel demand modeling, freight supply & demand modeling, and supply chain logistics modeling.  
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CIVIL AND CONSTRUCTION ENGINEERING FACULTY

CHRISTOPHER HIGGINS
Professor
Cecil and Sally Drinkward Professor
Structural

RESEARCH: Dr. Higgins’ research expertise is in experimental mechanics and he has extensive experience testing and evaluating structures subjected to a wide range of loading conditions including: seismic, wind, ocean waves, static, fatigue, and dynamic loads. He has conducted research on steel, concrete, composite, hybrid, and polymer structural materials. For his efforts, he has received numerous teaching and research awards throughout his career.

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KATHARINE HUNTER-ZAWORSKI
Associate Professor
Transportation

RESEARCH: Dr. Hunter-Zaworski’s research experience integrates biomechanics and ergonomics with rehabilitation and transportation engineering. She is passionate about developing safe, seamless and dignified accessible transportation systems for people with disabilities. She focuses on rail, aviation and public transportation.

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DAVID HILL
Professor
Coastal and Ocean

RESEARCH: Dr. Hill’s research portfolio includes numerous topics related to nearshore waters. Some recent examples include the linkages between tidal evolution and sea-level rise, the relationships between nearshore oceanographic conditions and biological and ecological processes, the role of coastal freshwater discharge in nearshore processes, and optical measurements of complex flow fields.

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DAVID HURWITZ
Associate Professor
Transportation, Engineering Education

RESEARCH: Dr. Hurwitz conducts research in the areas of transportation operations and safety. In particular Dr. Hurwitz is interested in the consideration of user behavior in the design and innovation of transportation systems. His current research portfolio includes projects dealing with intersection safety (vehicle-bicycle and vehicle-pedestrian crashes), transportation user behavior (driver response to traffic control devices and teenage distracted driving), and transportation engineering education (conceptual assessment of student learning and the dissemination of evidence base instructional practices).

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JASON IDEKER  
Associate Professor  
Infrastructure Materials  

RESEARCH: Dr. Ideker’s research group focuses on the prediction of long-term durability and characterization of early-age volume change of cement-based materials. Our multi-scale approach results in translational research that combines fundamental scientific understanding with the improvement and development of test methods and specifications that enhance concrete performance. We are recognized experts in concrete durability, namely alkali-silica reaction, early-age properties of calcium aluminate cements and characterization and prediction of drying shrinkage in high performance concrete.  

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BURKAN ISGOR  
Professor  
John and Jean Loosley Faculty Fellow  
Infrastructure Materials  

RESEARCH: The main focus of Dr. Isgor’s research is bridging the gap between nano-scale and macro-scale scientific and engineering problems using applied mathematics, computational materials science (continuum modeling, molecular dynamics and first principles calculations) and advanced analytical, spectroscopic, electrochemical techniques. These techniques allow Dr. Isgor to study interdisciplinary problems in materials science and engineering using both bottom-up (nano-to-macro) and top-down (macro-to-nano) approaches. Dr. Isgor’s research has applications in surface and interface science, corrosion science, electrochemistry, thin films & oxides, durability of materials, transport in porous media, cement & concrete research, inverse modeling and non-destructive testing and evaluation.  

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JUDY LIU  
Professor  
Structural, Engineering Education  

RESEARCH: In her research, Dr. Liu explores resilient steel structures, with focus on seismic and disproportionate collapse resistance. She has interests in behavior and design of structural steel connections and innovative systems for lateral resistance. She was awarded an AISC Milek Fellowship for research on steel slit panels for lateral resistance. Dr. Liu is a member of a number of committees, including the ASCE/SEI Disproportionate Collapse Mitigation Standard Committee, NCSEA Basic Education Committee, and AISC Partners in Education Committee.  

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CIVIL AND CONSTRUCTION ENGINEERING FACULTY

PEDRO LOMÓNACO
Director, O.H. Hinsdale Wave Research Lab
Coastal and Ocean

RESEARCH: Dr. Lomonaco joined Oregon State from the Environmental Hydraulics Institute, University of Cantabria, in Spain, where he was the Head of the Hydraulics, Coasts and Offshore Laboratory from 2007-2014. Previously, Dr. Lomonaco was a Research Officer of the National Research Council’s Canadian Hydraulics Centre, in Ottawa, where he designed and executed physical model testing of hydraulic, coastal and ocean structures.

Besides managing and coordinating the activities at the Hinsdale Wave Research Lab, his scientific activity primarily deals with studies of physical and numerical modeling of wave generation and propagation, wave-structure interaction, stability of coastal and submarine structures, behavior of floating structures, hydrodynamics, and non-linear behavior of long-waves in shallow waters.

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JOSEPH LOUIS
Assistant Professor
Construction

TEACHING: Dr. Louis teaches undergraduate and graduate classes in heavy civil operations and equipment, and analytical tools for construction. His research interest lies at the intersection of simulation, visualization, and automation within the context of construction operations. He draws upon concepts in these areas to provide construction managers with better means of planning, monitoring, and controlling their operations to improve safety, maximize productivities, and minimize equipment idle times.

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KENNY MARTIN
Senior Instructor
Structural

TEACHING: Mr. Martin’s areas of interest include structural design and analysis, design of wood structures, timber mechanics, and the properties & behavior of wood. He teaches undergraduate and graduate courses in engineering mechanics and structural engineering. Courses include ENGR 211 Statics, CE 484/584 Wood Design, and CE 427/527 Temporary Structures.

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BEN MASON
Associate Professor
Geotechnical

RESEARCH: Dr. Mason’s research interests include soil-fluid-structure interaction, residual and momentary soil liquefaction, cyclic mobility of intermediate soils, seismic resiliency on a city-scale, cumulative damage caused by successive hazards, and the seismic response of Willamette Valley silt. He focuses on megathrust earthquakes created by the Cascadia Subduction Zone. Dr. Mason leads the group’s Soil Dynamics laboratory, which contains cyclic triaxial and cyclic simple shear devices.

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THOMAS MILLER
Associate Professor
Structural, Engineering Education

RESEARCH: Dr. Miller’s structural engineering and structural mechanics current research interests include earthquake engineering, timber structures and cold-formed steel structures. Recent research projects involve modeling, behavior and seismic response of residential timber structures, effects of perforations in wood I-joists, environmental impacts of various construction materials in structures, directionality of oriented strand board in resisting shear and cross-laminated timber diaphragms.

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OREGON STATE UNIVERSITY - GRADUATE STUDIES
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TUBA OZKAN-HALLER
Professor
Coastal and Ocean
RESEARCH: Dr. Ozkan-Haller’s interests include numerical, field and analytical investigations of water motions in the nearshore zone, defined by water depth at the order of 10-meters or less. Of special interest is the application of numerical models to predict nearshore circulation as well as the modeling of bathymetric change due to this circulation field. Verification of the results is carried out using field and laboratory data.
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CHRIS PARRISH
Associate Professor
Eric H.I. and Janice Hoffman Faculty Scholar Geomatics
RESEARCH: Dr. Parrish’s research focuses on full-waveform LiDAR, topographic-bathymetric LiDAR, hyperspectral imagery, uncertainty modeling, and UAVs for coastal applications. Parrish is the Director of the American Society for Photogrammetry and Remote Sensing (ASPRS) Lidar Division and associate editor of the journal Marine Geodesy. Prior to joining Oregon State, he served as lead physical scientist in the Remote Sensing Division of NOAA’s National Geodetic Survey and affiliate professor in the Center for Coastal and Ocean Mapping – Joint Hydrographic Center at University of New Hampshire.
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JIIHYE PARK
Assistant Professor
Geomatics
RESEARCH: Dr. Park’s research interests include GNSS positioning/navigation and GNSS remote sensing. She focuses on advanced algorithms in order to improve positioning and navigation performance in harsh environments and detecting geophysical events such as natural hazards or artificial explosions by monitoring ionospheric disturbances via GNSS remote sensing.
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BRYSON ROBERTSON
Associate Professor
Director, Pacific Marine Energy Center
RESEARCH: Dr. Robertson’s research focuses on detailed wave, tidal and offshore wind energy resource assessments, optimizing energy harvesting technologies, and numerically integrating marine power into the electrical grid; at a variety of scale and opportunities. In complimentary research, Dr. Robertson also looks at the future of our global energy systems; the nexus of technology, policy, economics and society on the decarbonization of electrical systems; and the public trust requirements to transition power system.
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MICHAEL OLSEN
Associate Professor
Geomatics
RESEARCH: Dr. Olsen’s current areas of research include the application of terrestrial laser scanning, remote sensing, GIS, geohazard analysis, computer programming, and 3D visualization to various problems within civil engineering. He has developed new, groundbreaking courses in 3D laser scanning and Digital Terrain Modeling. Recent projects he has been involved with include a diverse range of applications including: development of mobile laser scanning guidelines for DOTs, earthquake and tsunami reconnaissance (following recent events in American Samoa, Chile, New Zealand, and Japan), landslide and slope stability analysis, seaciff erosion mapping using LiDAR, liquefaction hazard mapping for Utah, and modeling and studying historical buildings such as the Palazzo Medici and Palazzo Vecchio in Florence, Italy.
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CATARINA PESTANA
Instructor
Construction
RESEARCH: Dr. Pestana’s research interest lie the area of project management, including lean management and risk management and the integration of human factors with virtual design and simulation. Her research interests focuses on the enhancement of the performance of production systems and products in different stages of their life-cycle and supply chain in the AEC industry. The main methods used are based on lean thinking and lean management, as well as on risk-based optimization and management techniques. Current research address multi-criteria risk-based decision methodologies to identify and validate improvements to processes and on-site operations in the AEC industry.
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CIVIL AND CONSTRUCTION ENGINEERING FACULTY

MICHAEL SCOTT
Professor
The Glenn Willis Holcomb Professor in Structural Engineering
Structural

RESEARCH: Dr. Scott’s current research interests include nonlinear structural analysis and dynamics, fluid-structure interactions, structural response sensitivity, and numerical methods. He has experience teaching a number of graduate and undergraduate courses in the areas of structural analysis and dynamics, finite elements, structural simulation and modeling, and computer-aided engineering.

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ARMIN STUEDLEIN
Associate Professor
Geotechnical

RESEARCH: Dr. Stuedlein’s primary research interests center on the behavior, performance, and reliability of geotechnical structures, including deep and shallow foundations, improved ground, and mechanically stabilized earth walls. Dr. Stuedlein recently completed research for the Oregon DOT on the behavior of pipes and culverts installed by ramming, including the development of a comprehensive framework for the evaluation of pipe drivability. His approach combines the evaluation of instrumented geotechnical structures with lab-based soil characterization, numerical modeling, random field theory and geostatistics, and reliability theory to better understand and predict geotechnical performance.

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BARBARA SIMPSON
Assistant Professor
Structural

RESEARCH: Dr. Simpson uses advanced computational and experimental methods to characterize structural response. Her aim is to develop innovative structural systems that improve building performance and reduce the effects of natural hazards on the built environment. Research areas include resilient design and retrofit of building structures, performance-based earthquake engineering, and next-generation computational modeling, optimization, and simulation.

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DAVID TREJO
Professor
Hal Pritchett Chair
Construction, Infrastructure Materials

RESEARCH: Dr. Trejo’s research focuses on the design and development of materials and systems for efficient construction processes and products. His interests focus on the design and development of systems that allow for accelerated and durable construction. Specific research projects have included development of precast overhang systems for safe, rapid, and durable bridge construction, assessment and modeling of segmental, post-tensioned bridges exhibiting strand corrosion, modeling and performance assessment of glass fiber-reinforced polymer (GFRP) concrete reinforcement, and many others.

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CIVIL AND CONSTRUCTION ENGINEERING FACULTY

YELDA TURKAN
Assistant Professor
Robert C. Wilson Faculty Scholar
Construction

TEACHING: Dr. Turkan teaches construction contracts and virtual design and construction courses at undergraduate and graduate level. In 2015, she was awarded with ASCE ExCEEd Fellowship for completing the ExCEEd teaching workshop organized and supported by ASCE. In her research, Dr. Turkan investigates how lidar and virtual design and construction technologies can help improve project controls. Her research interests are centered on the areas of sensing, automation, and information technology for construction engineering and management, infrastructure asset management, and transportation.

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HAIZHONG WANG
Associate Professor
Transportation

RESEARCH: Dr. Wang conducts research in the areas of multi-scale traffic modeling and simulation for transportation operation and system management; stochastic agent-based modeling and simulation for emergency evacuation and disaster response; traffic control and network optimization; and critical lifeline infrastructure interdependency. In addition, his research also includes studying transportation system planning and travel behavior analysis; mobility, safety, energy and environmental analysis of connected and autonomous vehicle; road user charge economic analysis; and bicycle safety analysis.

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JASON WEISS
School Head, Professor
The Miles Lowell and Margaret Watt Edwards Distinguished Chair in Engineering
Director of the Kiewit Center for Infrastructure and Transportation Research
Infrastructure Materials

RESEARCH: Dr. Weiss is a leading researcher in the development of more durable and sustainable concrete. At CCE, Weiss directs the Kiewit Center for Infrastructure and Transportation Research and holds the Miles Lowell and Margaret Watt Edwards Distinguished Chair in Engineering. Weiss is internationally recognized for his work in concrete pavement, building and bridges. Specifically, he has focused on minimizing cracking, improving durability, and making concrete more sustainable. As head of CCE, Weiss is leading efforts to improve the resilience of the aging infrastructure.

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MEAGAN WENGROVE
Assistant Professor
Coastal and Ocean

RESEARCH: Dr. Wengrove’s teaching interests include hydraulics, coastal engineering, sediment transport, turbulence and boundary layers, and engineering nature based features. Much of her present research interest is related to the mechanics of sediment transport and hydraulic design of nature based features. Specifically, focusing on the relationship between scales of sediment transport (e.g. a ripple feeding morphologic change of a sandbar), the effects of large storm events on deep seated erosion, and the hydraulics of nature based features such as living shorelines, marsh restorations, and coastal dunes. Other research efforts are related to the effect of combined waves and currents on sediment transport, boundary layer momentum flux, and the physical mechanics of nutrient diffusion and mixing from surficial sediments.

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CIVIL AND CONSTRUCTION ENGINEERING FACULTY

HARRY YEH
Professor
Coastal and Ocean

RESEARCH: Dr. Yeh’s expertise is in the field of hydrodynamics associated with natural hazards, especially those in a wide variety of tsunami-related problems. He has conducted a wide range of field studies during his career and a majority of his recent research activities are cooperative with applied mathematicians, numerical experts, mitigation strategists, and information technologists and he has extensive collaborative experience with Japanese scientists and engineers.

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SOLOMON YIM
Professor
Coastal and Ocean, Structural

RESEARCH: Dr. Yim’s research focuses on fluid and structural mechanics in the marine environment using high-performance computing based multi-physics, multi-scale and multi-domain systems methods. His recent research topics include hydroelasticity, free-surface flow and fluid contact/impact on deformable marine structures; waves, tsunami, storm surge and earthquake loads modeling and simulation in field and laboratory environments; and mechanics of wave-energy conversion systems.

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