

CEE NEWS

A publication of the Civil and Environmental Engineering Department

Fall/Winter 2022



OLD DOMINION
UNIVERSITY

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Contact

Civil and Environmental
Engineering

Batten College of Engineering
and Technology

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With Gratitude and Determination

Dear colleagues and friends,

As we quickly approach the end of the fall semester, I am excited to reflect on the many accomplishments of our students, faculty, staff and alumni this year.

Following the retirement of Dr. Ishibashi, the department welcomed Dr. Pengfei Wang, who recently completed his PhD at UCLA. Dr. Wang joins the department as an associate professor, bringing his expertise in the interdisciplinary areas of geotechnical engineering and applied statistics. The department also welcomed our new office manager, Ms. Sara Champlin.



Our research activities continue to grow in externally funded awards and research expenditures. Annual research expenditures have amounted to more than \$1M annually in the last three years- a record for the department. This year, two of our faculty, Dr. Sandeep Kumar and Dr. Xixi Wang, were awarded Fulbright Scholarships. Dr. Kun Xie has recently been nominated by ODU for the SCHEV Rising Star award. Working closely with the research committee of the CEE Visiting Council, the department launched a new research seed funding program to encourage novel research ideas and increase competitiveness in pursuing large external grants in one or more of ODU strategic priority areas.

Forging ahead, the department continues to expand virtual engagement to increase accessibility and accommodate the needs of non-traditional and working students. We remain committed to mentoring and strengthening personal connections with students to increase retention and help our students get to the finish line. The department is conducting a comprehensive and holistic internal review and evaluation of the current curriculum to maintain or increase the rigor and technical competencies of the program while exploring opportunities to reduce time to graduation. In doing so, we are paying close attention to the civil engineering workforce needs and the future trends identified by ASCE in the Future World Vision Program. We are committed to addressing sustainability, risk, resilience, diversity, equity, and inclusion in the civil engineering program and profession.

On behalf of the department, I invite you to read the news we shared through this edition. Your comments and feedback are always welcome. Thank you again for your continued support and interest in the education and research mission of our department. I wish you and yours a wonderful holiday break and a happy new year!

Sherif Ishak, Ph.D., P.E., F.ASCE
Professor and Department Chair - CEE



CEE RESEARCH HIGHLIGHTS

Factors Influencing Pedestrian Decisions to Cross Mid-Block and Potential Countermeasures

Investigators: Kun Xie (PI, CEE), Hong Yang (Co-PI, ECE) and Sherif Ishak (Co-PI, CEE)

Pedestrians are the most vulnerable road users. Pedestrian crashes occurring at mid-block raise significant concerns as some pedestrians prefer to cross at mid-blocks even though neighboring signalized intersections provide them a protected crossing phase. The goal of this research is to investigate factors influencing pedestrian decisions to cross mid-blocks and identify potential countermeasures to enhance pedestrian safety. We aim to answer the basic question why do pedestrians cross mid-blocks and to develop safety solutions accordingly. Scientifically rigorous statistical models will be developed using field observation and survey data to understand what factors produce high percentages of uncontrolled mid-block crossings. Fully understanding pedestrian crossing behaviors will help reveal the risk mechanism and therefore ensure that appropriate countermeasures can be developed to mitigate crash risk.

Transportation Systems and Flood Resilience under Dynamic Sea Level Rise: Integrated Modeling to Assess Natural and Nature-Based Solutions for Roadway Flooding in Hampton Roads, Virginia

Investigators: Navid Tahvildari (PI, ODU), Mecit Cetin (CEE), Gangfeng Ma (CEE), Kun Xie (CEE), Tom Allen (Geography), Robert McNab (Economics), George McLeod (GeoSEA), and Maryam Shakiba (CU Boulder).

Sea level rise, more intense storms, and increased frequency of extreme rainfall all exacerbate flood risk to coastal roadways. The Hampton Roads region has the highest relative sea level rise rate on the U.S. East Coast, which is correlated with an increasing rate of roadway recurrent flooding and transportation network degradation. The project, led by Dr. Navid Tahvildari, are investigating how sea level rise and the associated increase in coastal flooding is impacting surface transportation networks in Hampton Roads, VA. Research will be guided by local, regional, and state decision makers, and combines integrative modeling to predict the effectiveness of natural and nature-based features to protect and increase the longevity of the transportation system.

Flood vulnerability of the roadway network from multiple drivers, socioeconomically diverse communities, and economic and national security significance make the Hampton Roads region a natural testbed for the proposed modeling framework. There are critical gaps in the understanding of how flooding results in surface transportation network degradation, which is needed to be able to assess the performance of flood protection systems. Advanced predictions of future flooding and changes in traffic dynamics due to flooding, combined with economic impact analysis and social vulnerability assessments will help evaluate the effectiveness of different natural and nature based feature interventions. Research from the project will inform coastal adaption decision making in Virginia.

Biolubricants for Plant Materials

The Biomass Research Laboratory (BRL), under the supervision of Dr. Sandeep Kumar, is developing a process of preparing biolubricant from unhydrolyzed solids (lignin) in collaboration with Montana State University-Northern. This project is funded through the United States Department of Agriculture (USDA).

The global lubricants market size reached \$125 billion in 2020, and over 55% of lubricants consumed annually escape into the environment from spills, improper disposal, and accidents. Over 95% of the spilled lubricants are petroleum based lubricants. These lubricants contaminate soil, drinking water, and air due to high toxicity and low biodegradability.

Biolubricants are still limited in usage due to the process cost, energy balance, and chemical usage. CEE graduate students are researching a new hydrothermal liquefaction (HTL) method that utilizes phenol as capping agent which aims to improve overall bi-oil yield and economical efficiency. Lignin, an abundant biomass on earth that can be extracted from tree, grass, and agricultural residues, is a renewable carbon source. Hydrothermal processes have an environmental advantage over conventional chemical processes.



Sunny day flooding on Hampton Blvd, Norfolk, VA showing restricted traffic flow on a flooded road segment. Photo Credit: Mecit Cetin

UNDERGRADUATE ALUMNI HIGHLIGHT

Jay Parker, Field Engineer, Allan Myers, Inc.

Jay Parker is a December 2020 CEE graduate, majoring in Civil Engineering with a minor in Civil Engineering Technology (Construction). She is currently serving as a Field Engineer with Allan Myers, Inc. in Chesapeake.

While at ODU, Jay interned with Newport News Shipbuilding for three years. She served as a Pre-Collegiate Initiative Chair and Secretary for the National Society of Black Engineers (NSBE), Secretary and then President of Chi Epsilon, and as the undergraduate student committee lead for ODU Engineering Ambassadors on the BCET Diversity, Equity, and Inclusion Committee.

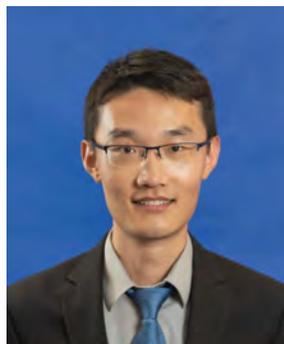
Jay encourages CEE students to "find your group and stay close because no man is an island. The hard work, blood, sweat, and (mainly) tears will all make sense eventually. Truly absorb as much information and knowledge as you can, because after graduation and working in the field, you'll see everything you're learning in class, again."



Jay Parker
ODU CEE Class of 2020



L to R: Patrick Ngabo, De'Leon LaFleur, Sutherlyn Brinn



Dr. Pengfei Wang

NEW FACULTY MEMBER *Welcome, Dr. Pengfei Wang!*

Joining us from the University of California, Los Angeles (UCLA), Pengfei Wang is our new assistant professor. Wang's primary research interests include geotechnical engineering, engineering seismology, and applied statistics, emphasizing regional geo-hazard modeling and analysis, multi-hazards risk assessment, geospatial analysis, and statistical learning and modeling in civil engineering applications.

He received his degrees in Geotechnical Engineering (UCLA, Ph.D. 2020), Statistics (UCLA, M.S. 2020), and Transportation Engineering (Tongji University, B.S. 2015).

Norfolk Trailblazer and ODU Alumna Honored

Kristen M. Lentz was the first female civil engineering graduate at Old Dominion University and the first female director of the Norfolk Department of Utilities. Now, the Norfolk water treatment plant on 37th Street bears her name. A pioneer for female professionals in male dominated fields within the city, Lentz was instrumental in



helping ODU students transition to professional engineers, particularly in the local community. Kristen served on the advisory council of the College of Engineering and volunteered for many years on the Civil and Environmental Engineering Visiting Council (CEEVC). Kristen launched the Department of Utilities first apprenticeship program, providing technical and job skills training and opportunities for those who might otherwise struggle to get their foot in the door. Kristen leaves a legacy of support and service to the City of Norfolk and ODU community.

CEE STUDENTS TAP INTO COMPETITION

2022 was a busy and exciting year for CEE students competing at local and national conferences. The Virginia Water Environment Association (VWEA) held its 19th Annual Student Design Competition on April 22nd with two CEE student teams competing in the Wastewater and Environmental categories. The two teams, advised by Dr. Mujde Erten-Unal and Dr. Gary Schafran, won first place in the Environmental category and second place in the Wastewater category. The first place team traveled to New Orleans in October to participate in the WEFTEC's Student Design Competition.

The Virginia Section of the American Water Works Association (AWWA) held its 19th Annual Student Water Challenge at WaterJAM on September 14th. ODU's team, comprised of undergraduate and graduate CEE students, won second place and received a cash prize of \$500 and a plaque for their achievement. Additionally, CEE graduate student Kayla Rutherford and Dr. Jaewan Yoon won first place in the YP Digital Knowledge Competition for their submission: "Feed-Backward Total Phosphorus TMDL Evaluation with Finite Segment Modeling Framework."

Congratulations to our faculty and students for a job well done!



L to R: Shashank Khatiwada, Dave Kibbie, Ujjwal Pokharel, Joey Wooten

Highlights of Civil and Environmental Engineering Scholarships and Award Recipients

Thanks to support from the Civil and Environmental Engineering Visiting Council (CEEVC), the Civil and Environmental Engineering Department awarded the William M. Boone Memorial Scholarships to four undergraduate students, the Richard Nettleton Memorial Scholarships to two undergraduate students, and a total of \$7,500 to seven graduate students who were selected for the William A. Drewry Graduate Enhancement Award.

William M. Boone Memorial Scholarship

- **Dave Kibbie** is a junior planning to graduate in December 2024. He is interested in Environmental and Water Resource Engineering. Currently, Dave is a water technology and research intern with the Hampton Roads Sanitation District (HRSD). Prior to attending ODU, Dave served six years in the Navy. He is active with the Environmental Engineering Student Association (EESA), American Society of Civil Engineers (ASCE), and Student Veterans of America (SVA).
- **John Morton** is a senior graduating in December 2022. His interests are in transportation and construction engineering. John is an ODU Football player and most recently completed an internship with Whiting-Turner Contracting. John is enlisted in the Navy as a member of the Civil Engineer Corps Collegiate program and will attend officer candidate school upon graduation.
- **Bradley Russo** is a senior graduating in May 2023. His interests are in structural engineering. Previously, he interned with VDOT and an engineering consulting firm in Norfolk. Bradley is also a member of the ODU ASCE Student Chapter.
- **Joey Wooten** is a senior graduating in May 2023. His interests are in environmental engineering, specifically sustainable development and water resources. Since January 2021, Joey has interned at HRSD. He is active with the ODU ASCE Student Chapter (President), Environmental Engineering Student Association (EESA), and Chi Epsilon.

William A. Drewry - Graduate Enhancement Award

The following graduate students were awarded for their scholastic achievement and promise:

- **George Adomako Kumi** is studying structural engineering. His current research focuses on the study of Thermo-Elastic-Plastic Behavior of beam-columns with applied torsion.
- **Xiaomeng Dong** is studying transportation engineering. She is researching transportation safety and how the COVID-19 pandemic impacts the likelihood of severe crashes via changing driving behaviors
- **Kyoko Hirayama** is studying environmental engineering. Her research is titled "Hydrothermal liquefaction of lignin into aromatic monomeric compounds." Kyoko was instrumental in the installation of an induction heating batch system which enables rapid heating. The object is to study the influence of heating rate to the biocrude yield, and its chemical composition to improve the economic feasibility of the process.
- **Behrouz Salahshour** is studying transportation engineering. He is researching intelligent transportation systems and transport modeling and simulation.
- **H.M. Stanikzai** is studying structural engineering. He is researching inelastic analysis and response of building frames subjected to earthquakes and ground excitations that are not aligned with the buildings principal axes. His work includes both experimental and theoretical investigation.
- **Guocong Zhai** is studying transportation engineering. He has published three academic papers involving transportation research: policy and practice, transport and environment, and transport geography.

Richard Nettleton Memorial Scholarship

- **Samantha Wilt** is a junior graduating in May 2024. She is an active member of the ODU Phi Sigma Rho Chapter, and recently completed an internship with the Whiting-Turner Contracting Company.
- **Kota Laning** is a junior graduating in May 2024. They are an active member of the ODU ASCE Student Chapter and have interned at Pennoni Associates and HDR.



Civil and Environmental Alumni Association

Did you know that the ODU CEE program has over 2,000 alumni? If you have any questions about chapter membership or upcoming events, please contact the ODU Alumni or Association at odualumni@odu.edu.

SAVE THE DATE

Winter 2022

December 17, 2022
Winter Commencement

December 23-Jan 2, 2023
ODU Holiday Break

Spring 2023

TBD
CEEVC Spring Seminar

April 2023
CEE Graduation Banquet

May 5-6, 2023
Spring Commencement



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