University Transportation Centers

30th Annual Outstanding Student of the Year Awards

Presented by:

U.S. DOT's University Transportation Centers (UTC) Program and the Council of University Transportation Centers (CUTC)

January 6, 2021

U.S. Department of Transportation
Office of the Assistant Secretary for Research and Technology

WELCOME

Welcome to the 30th Annual University Transportation Centers (UTC) Program's Outstanding Student of the Year Awards ceremony, sponsored by the U.S. Department of Transportation (U.S. DOT) and administered by the Office of the Assistant Secretary for Research and Technology (OST-R).

Each year, at the annual awards banquet of the Council of University Transportation Centers, the U.S. DOT honors outstanding students from participating UTCs for their achievements and promise for future contributions to the transportation field. Students of the Year are selected based on their accomplishments in such areas as technical merit and research, academic performance, professionalism, and leadership. This booklet provides an insightful overview of their accomplishments and goals.

OST-R administers the UTC Program with funding from the Federal Highway Administration.

University Transportation Centers Program

During the past few years, the U.S. DOT has launched several new initiatives designed to set transportation in motion toward a more connected, accessible, and sustainable future. Under the management of the U.S. DOT's Office of the Assistant Secretary for Research and Technology (OST-R), the University Transportation Centers (UTC) Program continues to bolster those efforts through advancing research on topics such as connected vehicles, pedestrian and cyclist safety, freight performance measures, and emissions reduction technologies.

Since its beginning, the mission of the UTC Program has focused on the development of advanced U.S. technology and expertise in transportation through education, research, and technology transfer at universities nationwide. The UTC Program was created by Section 314 of the Surface Transportation and Uniform Relocation Assistance Act of 1987, 49 U.S.C. §5317, with the primary purpose of conducting research.

The Intermodal Surface Transportation Equity Act (ISTEA) of 1991 reauthorized the UTC Program through fiscal year (FY) 1997, and expanded its mission to include education and technology transfer. In addition to the 10 Regional Centers, ISTEA created three "National" Centers and six University Research Institutes at universities named in ISTEA. This expansion led the U.S. DOT to adopt a strategic planning approach to program management based on a mission and set of goals that applied to all 13 centers and six institutes. The U.S. DOT extended the grants to the Regional Centers for three years, and announced its intention to reopen the program to competition, which occurred in 1994.

In 1998, the Transportation Equity Act for the 21st Century (TEA-21) reauthorized the UTC Program for an additional six years and increased the total number of centers from the original 10 to 33.

In 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) increased the number of centers to 60. In addition to the 10 Regional Centers, 10 Tier 1 funded centers were also competitively selected, and with the exception of the Title III centers, all of the UTCs were required to provide a one-for-one funding match.

The Surface Transportation Extension Act of 2011 (the Extension Act), gave discretion to redistribute the funds allocated to specific research projects and programs designated in SAFETEA-LU. In accordance with the Extension Act, the U.S. DOT competitively awarded grants to 22 UTCs in the amount of approximately $3.5 million each to 10 Tier 1 UTCs, two Tier 1 Transit-Focused UTCs, and 10 Regional UTCs, and FY 2012 funds were added following extension legislation.

In 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) continued the UTC program, authorizing the competitive selection of 35 UTCs to receive a total of $72.5 million in funding for each of FYs 2013 to 2014, with continued funding from extension acts through FY 2015. Following a competition in 2013, grants of approximately $3 million each were awarded to five National UTCs, $2.75 million each to 10 Regional UTCs, and $1.5 million each to 20 Tier 1 UTCs.

Fixing America's Surface Transportation (FAST) Act, signed in December 2015, was the first federal law in over a decade to provide long-term funding for surface transportation infrastructure planning and investment. The FAST Act authorized $305 billion in spending from FYs 2016 through 2020 for the maintenance of existing and establishment of new initiatives in research, education and workforce development, and the facilitation of technology transfer. To fulfill the FAST Act federal mandate, U.S. DOT hosted a grant competition that resulted in the announcement of 32 new UTCs in December 2016. UTCs in Federal Regions 1, 2, and 3 were added in 2018, and two new National Centers focusing on congestion and infrastructure research were added in 2019.

The Further Consolidated Appropriations Act, 2020, authorized $5M in funding to establish four new Tier 1 UTCs with each conducting research in one of the following topic areas:

1. Highly Automated Transportation Systems Research
2. Communications Technology and E-Commerce Effects on Travel Demand
3. Implications of Accessible Automated Vehicles and Mobility Services for People with Disabilities
4. Strategic Implications of Changing Public Transportation Travel Trends

For more information visit: https://www.transportation.gov/content/university-transportation-centers

University Transportation Centers
Outstanding Students of the Year

Students are organized by primary mode of interest/study area.

MARITIME	**Kaley Collins** University of Arkansas
MULTIMODAL	**Gabriella Abou-Zeid** Portland State University (PSU) **Jennifer Hall** The University of Texas at Austin **Amy Lee** University of California, Davis **Ladan Mozaffarian** University of Texas at Arlington **Adam Novotny** Virginia Tech **Nigel Pugh** North Carolina Agricultural and Technical State University **Rachel Seigel** University of Vermont **Rydell Walthall** The University of Texas at Austin **Amy Wyman** Oregon State University
PUBLIC TRANSIT	**Camille Boggan** University of Pennsylvania **Alex Eisenhart** San Jose State University **Lori Palaio** University of South Florida **Prarthana Raja** Rutgers, The State University of New Jersey **Ali Rahim-Taleqani** North Dakota State University

Ruwa AbuFarsakh
Louisiana State University

Katherine Asmussen
The University of Texas at Austin

Benjamin Bauchwitz
Duke University

Maha Elouni
Virginia Tech

Patrick Emami
University of Florida

Sydney James
University of Nebraska-Lincoln

Trevor Looney
The University of Oklahoma

Daniel McCabe
University of Washington

Cadence Motley
University of Nevada at Reno

Abdullah Jalal Nafakh
Purdue University

Campbell Neighborgall
Virginia Tech

Samuel Ricord
University of Washington

Emiliano Ruiz
The University of Texas at El Paso

Theodore Sjurseth
South Dakota State University

Samuel Speroni
University of California, Los Angeles

Christian Viniarski
University of Delaware

Yan Zhang
Washington State University

Kaley Collins

University of Arkansas

Maritime Transportation Research and Education Center (MarTREC)

kec023@uark.edu

Bio

Kaley Collins believes in pushing the limits of what she can achieve; her motto is "I don't know what 'can't' means." As a current graduate student in the Steel Structures Research Lab at the University of Arkansas (UArk), she is working to make critical port structure more reliable through research on modeling combined storm surge and wind demands during extreme meteorological events such as hurricanes. While an undergraduate Civil Engineering student, Kaley performed an honors research project characterizing 3-D printed steel material properties. Kaley's interests and engagement outside of research and academics are broad: She participated on the University of Arkansas Ranch Horse Team for four years; served as a UArk Student Ambassador and Honors College Ambassador, and as a member of the Academic Integrity Board and the Student Conduct Board, was active in UArk's Chi Epsilon Civil Engineering student service organization, and participated in other student societies.

Degree and Graduation Date (or Anticipated Date)

Master's degree in Civil Engineering from the University of Arkansas, May 2021

B.S. in Civil Engineering from the University of Arkansas, May 2020

Preferred Career after Graduation

Kaley will continue on for a PhD after completing her master's degree, and she intends to pursue a career in the private sector.

Broad Research Interest Area

Infrastructure systems

Specific Research Area

Numerical modeling of materials to determine failure conditions under different loads

Primary Mode(s)

Maritime

Top Accomplishment in 2020

In 2020, Kaley was recognized with a National Science Foundation Graduate Research Fellowship (NSF GRFP) Honorable Mention.

Thesis Title and Summary

"Port Infrastructure Resilience through Combined Wind-Surge Demand Characterization"

This research seeks to understand the interactive effects of severe wind and storm surge demands on port infrastructure, and to develop hazard demand models to aid improvements to infrastructure design resilience.

Gabriella Abou-Zeid

Portland State University

National Institute of Transportation and Communities

Gabou2@pdx.edu

Bio

Gabriella Abou-Zeid holds a B.S. in Sustainable Built Environments from the University of Arizona and is currently a second-year Civil Engineering master's student with transportation emphasis at Portland State University (PSU). Working in Dr. Kelly Clifton's Sustainable Urban Planning and Engineering Research Lab (SUPERLab) at PSU, her interdisciplinary research examines multimodal travel behavior, urban freight, and intersections between transportation and land use. She is the Dwight D. Eisenhower Transportation Fellowship Program's Top Ranked Masters Fellow for 2019–2020, and a 2020 Eno Center for Transportation Future Leaders Development Conference Fellow.

Degree and Graduation Date (or Anticipated Date)

M.S. in Civil Engineering (Transportation) from Portland State University, June 2021

B.S. in Sustainable Built Environments from the University of Arizona, May 2019

Preferred Career after Graduation

Gabriella intends to pursue a career in academia or the public sector.

Broad Research Interest Area

Transportation planning; transport policy; Intelligent Transportation Systems; freight

Specific Research Area

Transportation, land use, and travel behavior

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

In addition to being selected as Outstanding Student of the Year by the National Institute for Transportation and Communities (NITC), Gabriella was honored to join the Dwight David Eisenhower Transportation Fellowship Program cohort for the second year in a row.

Thesis Title and Summary

"Household Provisioning and COVID-19: Transportation Impacts, Technology Adoption, and Barriers to Food Access"

Building on a novel dataset of survey responses across five states, this work examines the impacts on shopping trips for food and household items in response to the COVID-19 pandemic. Trip-making strategies are explored across land uses, including use of online or smartphone-based services to coordinate grocery pickup or delivery. The adoption of such services is likely uneven across demographic groups, given barriers to technology or differential access to grocery stores. The findings of this research are critical for future emergency planning efforts, and will inform the extent to which changed travel behavior strategies in response to the pandemic will remain in the recovery period and beyond.

Jennifer Hall

The University of Texas at Austin

Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE) led by the University of North Carolina, Charlotte

Jennyhall381@gmail.com

Bio

As an undergraduate research assistant to Dr. Randy Machemehl at the University of Texas at Austin (UT Austin) in 2017, Jennifer Hall co-authored a report for the Canadian Society for Civil Engineering that compared unsafe cyclist behavior among three urban test beds in Austin, TX. This experience motivated Jennifer to pursue graduate studies in Civil Engineering, specializing in Transportation Engineering, while continuing her research under Dr. Machemehl. She has contributed to team projects that have produced a traffic impact analysis, characterization of cyclist behavior, a parking analysis, and several demand models for off-street bicycle facilities. Jennifer plans to continue for a PhD.

Degree and Graduation Date (or Anticipated Date)

PhD in Civil Engineering from the University of Texas at Austin, May 2022

M.S. in Civil Engineering from the University of Texas at Austin, December 2020

B.S. in Civil Engineering from the University of Texas at Austin, May 2019

Preferred Career after Graduation

Jennifer will be seeking a PhD at UT Austin, and then pursue a career in the public or private sector.

Broad Research Interest Area

Transportation planning; traffic engineering

Specific Research Area

Active transportation; traffic operations; public transportation

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Jennifer was awarded the Jack and Beverly Randall Endowed Graduate Student Fellowship for Excellence in Civil Engineering. She also was lead researcher in helping Texas Performing Arts (the UT Austin performing arts center) conduct a parking analysis.

Thesis Title and Summary

"Forecasting Off-Street Bicycle Facility Demands"

This thesis presents three different off-street bicycle demand models. The first model is a time series analysis that was created through the collection of cyclist counts; the second model predicts the number of cyclists from local sociodemographic data; and the third model predicts the number of cyclists from local weather data. This thesis is intended to supply city planners with accurate and flexible demand models that can be applied to any off-street bicycle facility environment.

Amy Lee

University of California, Davis

National Center for Sustainable Transportation (NCST)

aelee@ucdavis.edu

Bio

Amy Lee is a PhD candidate in the Transportation Technology and Policy Graduate Group at the University of California, Davis (UC Davis). Amy's research focuses on the relationships between transportation and land use, particularly the impacts of policy and politics on urban planning, transportation planning, and, ultimately, travel behavior and climate change. Amy has been an instructor and a teaching assistant, and has lectured for courses in the Department of Environmental Science and Policy at UC Davis. Prior to pursuing a PhD, Amy was a research analyst on the Modeling and Climate & Energy teams at the Sacramento Area Council of Governments.

Degree and Graduation Date (or Anticipated Date)

PhD in Transportation Technology and Policy from UC Davis, 2022

M.S. in Transportation Technology and Policy from UC Davis, 2017

B.S. in Environmental Policy Analysis and Planning from UC Davis, 2011

Preferred Career after Graduation

Amy will pursue a career in academia, consulting, or the public sector after receiving her PhD.

Broad Research Interest Area

Transportation planning, transportation policy

Specific Research Area

Transportation and land use

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Amy published two peer-reviewed articles, one of which built and showcased the analytical method that the California Department of Transportation adopted as its recommended methodology to evaluate the induced vehicle miles traveled (VMT) of state highway expansions.

Thesis Title and Summary

"Big Structural Change: A Mixed-Methods Investigation into the Policy and Politics of Land Use and Transportation Infrastructure in California"

This dissertation investigates the upstream factors of land use and transportation politics and policymaking in California through two streams of inquiry: (1) A study of the political coalitions involved in California's statewide zoning policy, including the beliefs, ideologies, and interests that unite those coalitions; and (2) A longitudinal analysis of transportation investments in major metropolitan regions, evaluating if and how highway investment patterns have changed over the last 20 years and the factors that have driven change or entrenched the status quo.

Ladan Mozaffarian

University of Texas at Arlington

Center for Transportation Equity, Decisions, and Dollars (CTEDD)

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Bio

A graduate research assistant at the University of Texas at Arlington Center for Transportation Equity, Decisions, and Dollars (C-TEDD), Ladan Mozaffarian is C-TEDD's lead on GIS, data analysis, and visualization software packages. Her goal is to synthesize useful findings on how urban planners and policymakers should react to social and environmental change. With a background in architecture and landscape architecture, Ladan is interested in knowing how cities will shape, and be shaped by, their human inhabitants. In that vein, she seeks to understand and document the economic, social, and environmental impacts of the relationship between humans and the built and natural environments.

Degree and Graduation Date (or Anticipated Date)

PhD in Urban Planning and Public Policy from the University of Texas at Arlington, December 2023

Master of Landscape Architecture from Shahid Beheshti University (SBU), Jan. 2012

Bachelor of Architecture from Shahid Beheshti University (SBU), August 2009

Preferred Career after Graduation

Ladan will seek a career in academia.

Broad Research Interest Area

Transportation planning; transport policy; Intelligent Transportation Systems

Specific Research Area

The intersection of innovation, equity, and transportation policy in cities

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Ladan had two papers accepted by the Transportation Research Record (TRR) and the Journal of Urban Sustainability.

Thesis Title and Summary

"The Role of Built Environment Attributes and Transportation in Enhancing Innovation and Productivity in Urban Areas"

The role of built-environment attributes and other environmental factors in promoting innovation has rarely been discussed in previous studies. Additionally, there is no comprehensive measure of innovation friendliness for urban areas. The first objective of this research is to develop a methodological framework that comprehensively and objectively measures innovation's environmental detriments. As a second research objective, this study seeks to ascertain the positive and negative social and environmental impacts of innovation districts/clusters of innovation within cities.

Adam Novotny

Virginia Tech

Safety through Disruption (Safe-D)

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Bio

Adam Novotny is a third-year PhD student in the Virginia Tech—Wake Forest University Biomedical Engineering and Sciences program, working under Dr. Zachary Doerzaph in the Center for Advanced Automotive Research at the Virginia Tech Transportation Institute (VTTI). He has worked on several projects, studying human factors, injury biomechanics, connected and automated vehicle technology, and vehicle safety system development. Currently, Adam is leading a study of e-scooter safety injury reports and system design for one of the leading micromobility companies in the United States.

Degree and Graduation Date (or Anticipated Date)

PhD in Biomedical Engineering from Virginia Tech, May 2022

B.S. in Mechanical Engineering from The College of New Jersey, May 2018

Preferred Career after Graduation

Adam is seeking a career in the public sector.

Broad Research Interest Area

Transport policy

Specific Research Area

Human factors and biomechanics in advanced vehicle safety systems; automated- and connected vehicle technology development

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Adam was first author on a soon-to-be published-paper titled "Concept Development of the Novel Pre Rear-End Positioning and Risk Extenuation System (PREPARES)." In 2019, his team won the international title with this project in the Collegiate Student Safety Technology Design Competition (SSTDC) of the Enhanced Safety of Vehicles (ESV) 26th International Technical Conference.

Thesis Title and Summary

"E-Scooter Safety Improvements through Design and Training"

This project seeks insight into the nature, frequency, and severity of injuries resulting from e-scooter crashes, and, using a variety data collection methods, to identify the major factors contributing to crashes and injuries. The results will inform the design of countermeasures to be incorporated into a revised prototype e-scooter design intended to induce safer riding behavior. Prototype testing through simulation, lab, or field evaluation will be performed to assess the updated design's performance and potential safety benefits. The results will also be used to develop improved training materials and methods for inexperienced riders.

Nigel Pugh

North Carolina Agricultural and Technical State University

Center for Advanced Transportation Mobility (CATM)

nrpugh@aggies.ncat.edu

Bio

Nigel Pugh is a PhD candidate in Computational Science and Engineering at North Carolina A&T State University after earning simultaneous bachelor's degrees in Computer Science and Mathematics from Elizabeth City State University. Nigel's current research primarily focuses on dynamic path planning and artificial intelligence (AI)-based decision making under uncertainty. In summer 2020, he interned with NASA's Jet Propulsion Laboratory, applying his skillset to the optimal multi-stage route planning for space vehicles. Nigel has worked on a variety of research projects, on topics including emergency evacuation path planning, airport congestion mitigation, traffic speed prediction, and secondary incident prediction.

Degree and Graduation Date (or Anticipated Date)

PhD in Computational Science and Engineering from North Carolina A&T State University, December 2021

Bachelor's degrees in Computer Science and Mathematics from Elizabeth City State University, 2017

Preferred Career after Graduation

Nigel will pursue a career in the public and/or private sectors after receiving his doctorate.

Broad Research Interest Area

Transportation planning; Intelligent Transportation Systems

Specific Research Area

Emergency planning, emergency evacuations, and safety

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Nigel was the corresponding author on a paper titled "Deep Adaptive Learning for Safe and Efficient Navigation of Pedestrian Dynamics," which is currently under review for publication by the journal IET Intelligent Transport Systems.

Thesis Title and Summary

"AI-Based Decision Making in Human-In-the-Loop"

This research develops an optimal navigation model providing more navigation guidance for evacuation emergencies to minimize total evacuation time while considering the influence of other passengers, based on the social-force model. Nigel will expand this current framework to incorporate decision making in partially observable emergency environments and develop a multi-agent modeling framework in emergency evacuation scenarios.

Rachel Seigel

University of Vermont

Transportation Infrastructure Durability Center (TDIC) led by the University of Maine

rseigel@uvm.edu

Bio

Rachel Siegel is deeply interested in the growing problem of increasingly frequent extreme precipitation events in the northeast U.S. In order to acquire the training and credentials to prepare her technically for work in this area, she entered the master's degree program in Civil and Environmental Engineering at the University of Vermont in June 2019 after working in the field.

Degree and Graduation Date (or Anticipated Date)

M.S. in Civil and Environmental Engineering from the University of Vermont, May 2021

B.S. in Environmental Studies from the University of Vermont, May 2016

Preferred Career after Graduation

Rachel wants to work on flood modeling or observation, performing risk analysis for areas under threat of flood events.

Broad Research Interest Area

Transportation planning; infrastructure systems

Specific Research Area

Modeling bridge-stream network interactions under transient conditions, and evaluating these interactions to frame bridge risk assessments and flood mitigation

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Rachel completed all simulations for the Mad River HEC-RAS model.

Thesis Title and Summary

"Bridge-Stream Network Analysis across Multiple Sites to Identify Sensitive Structural and Hydraulic Parameters for Flood Risk Assessment and Floodplain Reconnection"

The northeastern United States is experiencing more frequent and extreme precipitation events of longer duration. Infrastructure must now be able to withstand more frequent major flood events. Satisfying the rigorous hydraulic demands of these floods on all bridges and structures is infeasible, so prioritizing resources to minimize flood damage is critical. This thesis attempts to quantify the dynamic interactions between a river and its surrounding infrastructure (particularly bridges) under highly uncertain, transient conditions. The purpose is to help assess a number of flood mitigation strategies, such as widening bridges, lowering approaches, and adding culverts. The analysis uses two-dimensional HEC-RAS models, developed for three Vermont river corridors with varying features. Multiple model simulations are performed over 25- to 500-year flood events. The analysis results are compared and contrasted across the three study sites to develop a framework for assessing flood mitigation of a bridge-stream network.

Rydell Walthall

The University of Texas at Austin

Cooperative Mobility for Competitive Megaregions (CM2)

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Bio

Rydell Walthall specializes in transportation economics and policy, and has worked on projects for the Texas and U.S. Departments of Transportation, the city of Austin, and the North Central Texas Council of Governments. Rydell has interned at the American Society of Civil Engineers, and taken leadership roles in student organizations such as the student chapter of the Institute of Transportation Engineers and University Democrats.

Degree and Graduation Date (or Anticipated Date)

PhD in Civil Engineering from the University of Texas at Austin, spring 2022

Dual M.P.Aff. in Public Affairs and M.S.E. in Civil Engineering from the University of Texas at Austin, December 2019

B.S. in Civil Engineering from the University of Texas at Austin, December 2013

Preferred Career after Graduation

Rydell is seeking a career in the public sector.

Broad Research Interest Area

Transport policy

Specific Research Area

Transportation economics and policy

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Rydell completed a thesis in fulfillment of the requirements for dual master's degrees in Public Affairs and Civil Engineering.

Thesis Title and Summary

"Rail Electrification's Potential for Emissions Abatement in the Freight Industry: A Case Study of a Transcontinental Rail Corridor"

This research examines freight rail electrification by creating an energy model to simulate trains along specific corridors. The parameters for the energy model were developed after an extensive literature review. Using publicly available data sources, the model was applied to simulate intermodal trains along the southern BNSF TransCon rail corridor between Los Angeles and Chicago. An economic model based on the simulation results shows freight rail electrification can bring significant returns on investment to private companies and produce large public benefits. Uncertainty in some of the parameters means there is a chance for the investment to perform poorly; however, this risk can be mitigated by public policies. Public subsidies for capital, electricity, or tax credits might incentivize electrification while increasing net social benefits.

Amy Wyman

Oregon State University

Pacific Northwest Transportation Consortium (PacTrans) led by the University of Washington

wymana@oregonstate.edu

Bio

Amy Wyman is entering her second year as a PhD student focusing on transportation engineering at Oregon State University (OSU). After receiving her bachelor's degree in Civil Engineering from OSU in 2017, she worked for two years in Phoenix, Arizona as a traffic engineer at the civil engineering consulting firm Burgess & Niple before returning to OSU for graduate school. She is a member of OSU's Driving and Bicycling Simulator Laboratory, and is passionate about active transportation, transportation safety, and promoting women and minorities in STEM.

Degree and Graduation Date (or Anticipated Date)

PhD in Civil Engineering from Oregon State University, June 2024

Honors B.S. in Civil Engineering from Oregon State University, June 2017

Preferred Career after Graduation

Following completion of her doctorate, Amy will pursue a career in academia.

Broad Research Interest Area

Traffic engineering

Specific Research Area

Transportation Human Factors and Safety

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Amy co-developed and co-led a week-long National Summer Transportation Institute camp for high school students.

Thesis Title and Summary

"Integrating Active Transportation Modes into Connected and Automated Transportation Systems: Conceptual Design and Evaluation of Human Machine Interfaces"

Human Machine Interfaces (HMIs) are developed and evaluated for a variety of applications, including smart phone HMIs to provide information for bicyclists approaching signalized intersections, and external HMIs on highly automated vehicles for facilitating bicyclist and pedestrian interactions.

Camille Boggan

University of Pennsylvania

Mobility21, A National University Transportation Center for Improving Mobility of People and Goods led by Carnegie Mellon University

boggancm@design.upenn.edu

Bio

Camille Boggan is a city planning graduate student at the University of Pennsylvania's Weitzman School of Design. She graduated Phi Beta Kappa from Miami University (Ohio) in 2019 with a bachelor's degree in sociology. As a graduate research assistant in Dr. Megan Ryerson's Safe Mobility Lab, Camille has supported research efforts into transportation safety and wayfinding. In 2020, she interned with the city of Philadelphia's Office of Transportation, Infrastructure, and Sustainability, and has served on the transit steering committee of 5th Square, Philadelphia's urban activist PAC, since 2019.

Degree and Graduation Date (or Anticipated Date)

Master of City Planning (M.C.P.) from the University of Pennsylvania, May 2021

B.A. in Sociology from Miami University (Ohio), May 2019

Preferred Career after Graduation

Camille will seek a career in the public sector.

Broad Research Interest Area

Transportation planning

Specific Research Area

Women-centered transit planning

Primary Mode(s)

Public transit

Top Accomplishment in 2020

Camille was a member of the Penn team that won the ITS America's Emerging Leaders Program Global Challenge with its transportation pricing model for Philadelphia to reduce congestion and direct funds to public transportation services. She was also recently awarded a graduate scholarship from the Women's Transportation Seminar (WTS) Philadelphia chapter.

Thesis Title and Summary

"Encumbered Journeys: Evaluating Mobility of Transit-Reliant Female Caregivers"

Transportation networks in major cities are built and managed around a very narrow subset of transit riders: able-bodied, solo men traveling to and from a white-collar job in the city center. In 2018, the Bureau of Labor Statistics reported women in the United States made up 50 percent of public transit commuters, yet comprise only 47 percent of the workforce. Despite the evidence of women as primary users of public transportation and as primary caregivers of their children, planning practices have lagged behind in considering their specific needs. This thesis aims to analyze the public transit network in Philadelphia from the perspective of transit-reliant female caregivers and identify areas of inaccessibility.

Alex Eisenhart

San Jose State University

Mineta Transportation Institute

alexandre.eisenhart@sjsu.edu

Bio

In addition to pursuing a master's degree in Transportation Management from San Jose State University, Alex is currently serving as Communications Analyst for the city of Dublin, California. After studying film and media production as an undergraduate, he began his career in Public Health communications. He then became a Public Affairs Specialist for the San Mateo County Transit District, focusing on press relations, crisis communications, creative content development, and campaign strategy. Alex is eager to leverage his new degree to help advance sustainability initiatives through public awareness and community engagement.

Degree and Graduation Date (or Anticipated Date)

M.S. in Transportation Management from San Jose State University, June 2021

B.A. in Media Arts Production from Emerson College, 2016

Preferred Career after Graduation

Alex will pursue a career in the public sector after completing his master's studies.

Broad Research Interest Area

Transportation planning; transport policy

Specific Research Area

Reimagining transportation planning and marketing strategies to foster increased public transit ridership

Primary Mode(s)

Public transit

Top Accomplishment in 2020

Alex's biggest accomplishment in 2020 was spearheading a public awareness campaign to honor and celebrate the dedication of SamTrans' frontline transit workers in the midst of the coronavirus pandemic.

Thesis Title and Summary

"Evaluating the Launch of SamTrans' Foster City Commuter Express (Route FCX)"

An evaluation of the agency's marketing and service planning strategies leading up to the launch of Route FCX. The capstone is primarily intended to inform agency staff about how to approach future express bus service launches in addition to that of outside public transit operators with similar routes and ridership characteristics.

Lori Palaio

University of South Florida

Center for Teaching Old Models New Tricks (TOMNET) led by Arizona State University

loripalaio@gmail.com

Bio

Lori Palaio conducts research at the Center for Urban Transportation Research (CUTR), using large data platforms to compare bike-sharing usage across explanatory variables that include system size, weather, location, and trip purpose.

Degree and Graduation Date (or Anticipated Date)

M.S. in Civil Engineering from the University of South Florida, December 2020

B.S. in Civil Engineering from the University of South Florida, December 2018

Preferred Career after Graduation

Lori is seeking a career in the private sector and/or consulting.

Broad Research Interest Area

Transportation planning; traffic engineering

Specific Research Area

System-level bikeshare ridership analysis

Primary Mode(s)

Public transit

Top Accomplishment in 2020

Lori was named a Dwight David Eisenhower Transportation Fellow, and was awarded a Georgia Brosch Transportation Scholarship by CUTR. Additionally, she was elected Treasurer of the USF Institute of Engineers Student Chapter. Lastly, she successfully defended her master's thesis virtually.

Thesis Title and Summary

"A Multi-City Investigation of the Effect of Holidays on Bikeshare System Ridership"

This project is a multi-city study of the effect of holidays on system-level bikeshare ridership using a log-linear regression model with robust standard errors. The results show the impacts of holidays on bikeshare system ridership for different user types in systems in the Washington D.C., Chicago, Boston, Los Angeles, and Minneapolis metro areas.

Prarthana Raja

Rutgers, The State University of New Jersey

Center for Advanced Infrastructure and Transportation (CAIT)

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Bio

While a trainee in the Rutgers Coastal Climate Risk and Resilience (C2R2) program, Prarthana Raja discovered her passion for characterizing and modeling the built environment to address contemporary issues such as natural disasters. Because of her skill in spatial sensing and data modeling, she has had the opportunity to work on a number of landmark projects—notably, scanning and modeling the Port Authority Bus Terminal in NYC for crowd management during extreme events. Most recently, she has been investigating the use of Light Detection and Ranging (LiDAR) to find the most efficient way to sanitize NJ Transit buses during the COVID-19 pandemic.

Degree and Graduation Date (or Anticipated Date)

PhD in Civil and Environmental Engineering from Rutgers University, May 2022

M.S. in Civil and Environmental Engineering from Rutgers University, 2014

Bachelor's degree in Architecture, Anna University, April 2011

Preferred Career after Graduation

Prarthana will pursue a career in academia after completing her doctorate.

Broad Research Interest Area

Transportation planning; infrastructure systems

Specific Research Area

Remote sensing; Building/Civil Information Modeling (BIM); coastal hazards and climate risk

Primary Mode(s)

Public transit

Top Accomplishment in 2020

Prarthana's biggest accomplishment in 2020 was her completion of a Rutgers Coastal Climate Risk and Resilience (C2R2) transdisciplinary traineeship funded by the National Science Foundation (NSF). After spending over two years learning directly from stakeholders, she is excited to utilize a transdisciplinary approach in her research.

Thesis Title and Summary

"Asset and Infrastructure Vulnerability Assessment of Hazards in Coastal Communities"

Harnessing emerging geospatial data sets and developing data science approaches to study the vulnerability of infrastructures and buildings in distressed coastal communities to climate-related threats such as hurricanes, sea level rise, and flooding.

Ali Rahim-Taleqani

North Dakota State University

Small Urban, Rural and Tribal Center on Mobility (SURTCOM) led by Montana State University

ali.rahim.taleqani@gmail.com or

ali.rahimtaleqani@ndsu.edu

Bio

Ali Rahim-Taleqani has over 10 years of experience in international freight forwarding, logistics, and domestic transport. He received his PhD in Transportation and Logistics from North Dakota State University (NDSU) in May 2020. During his doctoral studies, he worked on several projects relating to micro-mobility using simulation, optimization, and machine learning. Now a master's degree student in Computer Science, Ali is conducting research with the Small Urban and Rural Center on Mobility (SURCOM) at NDSU's Upper Great Plains Transportation Institute. He is currently developing a web application that will help rural and small urban transit agencies identify and project their state-of-good-repair.

Degree and Graduation Date (or Anticipated Date)

PhD in Transportation and Logistics from North Dakota State University, May 2020

M.S. in Computer Science from North Dakota State University, December 2020

Bachelor's degree in Mechanical Engineering, Azad University, May 2009

Preferred Career after Graduation

Ali will pursue a career in the public and/or private sector.

Broad Research Interest Area

Transportation planning; Intelligent Transportation Systems

Specific Research Area

Transportation network analysis; machine learning

Primary Mode(s)

Public transit

Top Accomplishment in 2020

In addition to receiving his PhD, Ali published his third journal article, "Maximum Closeness Centrality k-Clubs: A Study of Dock-Less Bike Sharing" in the Journal of Advanced Transportation.

Thesis Title and Summary

"Next-Visiting Location Prediction Using Encoder-Decoder LSTM"

Ali's thesis investigated the significance of choosing appropriate recurrent neural networks (RNNs) architecture for a spatial-temporal next-location prediction framework. Dockless shared micro-mobility, such as a bike/scooter sharing program, provides spatial trajectory data that entails essential mobility information. The study compares (i) the variable-sized geo-hash tessellation, and (ii) two common RNN architectures, Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRU), using bike/scooter location data for Washington, DC. LSTM and GRU networks are used for modeling and incorporating information from spatial neighbors into the model. The study suggests that the LSTM model yields slightly better performance over the GRU model based on the same tessellation.

Ruwa AbuFarsakh

Louisiana State University

Transportation Consortium of South-Central States (Tran-SET)
(a FAST Act UTC)

rabufa1@lsu.edu

Bio

As an M.S./PhD dual degree student in Engineering Science at Louisiana State University, Ruwa AbuFarsakh is currently working on research pertaining to sustainable engineered geopolymer composites. She interned in 2018-2019 at the Louisiana Department of Transportation and Development (LaDOTD) in the geotechnical application of bridge design. She was a student worker at Louisiana Transportation Research Center, where she worked on identifying soil specific gravities and analyzing soil borings. Ruwa became a College Reading and Learning Association (CRLA) Certified Advanced Tutor in 2016.

Degree and Graduation Date (or Anticipated Date)

PhD in Engineering Science from Louisiana State University, spring 2023

M.S. in Engineering Science from Louisiana State University, spring 2022

B.S. in Civil Engineering from Louisiana State University, spring 2019

Preferred Career after Graduation

Ruwa will pursue a career in academia after completing her joint degree program.

Broad Research Interest Area

Infrastructure systems; Materials

Specific Research Area

Engineered geopolymer composites (EGCs) for sustainable transportation infrastructure

Primary Mode(s)

Road

Top Accomplishment in 2020

Ruwa helped write and edit a journal article, "Novel Metakaolin Based Engineered Geopolymer Composites for Transportation Applications" (under review in the Transportation Research Record (TRR) in 2020).

Thesis Title and Summary

"Novel Metakaolin Based Engineered Geopolymer Composites for Transportation Applications"

Geopolymer-based ECCs, or EGCs, were introduced as an alternative to ECCs in order to benefit from the eco-friendly and sustainable nature of GP binders, and to enhance the mechanical properties (especially ductility) of otherwise brittle GPs. Although the published studies on EGCs are still scarce and mostly limited to EGCs prepared with short PVA fibers, the published results are very promising. In contrast to the cementitious matrices of ECC materials, GP matrices exhibit lower fracture toughness (Km) and lower tensile strength (cr) while attaining comparable compressive strengths (Ohno and Li 2018). This study proposes the development of EGC materials implementing locally available ingredients to produce practical and cost-effective EGCs for new construction and repair of transportation infrastructure in the region.

Katherine Asmussen

The University of Texas at Austin

Data-Supported Transportation Operations and Planning (D-STOP) Center led by the University of Austin (a MAP-21 UTC)

kasmussen29@utexas.edu

Bio

Katherine Asmussen is currently a master's degree and PhD candidate at the University of Texas at Austin. Her research interests are travel behavior modeling; discrete choice models; infrastructure performance, and its economic and policy impacts; and the future implications of connected and autonomous vehicles (CAVs) on the psychology of drivers. Through her research and past work experience in telecommunications and electrical engineering consulting, Katherine has expertise in infrastructure and vehicle communication, stakeholder engagement, and data analytics, all applicable in numerous contexts.

Degree and Graduation Date (or Anticipated Date)

PhD in Civil Engineering at the University of Texas at Austin, 2023

M.S. in Civil Engineering at the University of Texas at Austin, December 2020

B.S. in Civil Engineering from the University of Virginia, May 2018

Preferred Career after Graduation

Katherine will continue on for a PhD, and then pursue a career in academia.

Broad Research Interest Area

Transportation planning

Specific Research Area

Connected and automated vehicles; behavior analysis; travel behavior and demand modeling

Primary Mode(s)

Road

Top Accomplishment in 2020

Katherine authored a paper published in Transportation Research Part C: Emerging Technologies.

Thesis Title and Summary

"A Socio-Technical Model of Autonomous Vehicle Adoption Using Ranked Choice Stated Preference Data"

Understanding the "if" and "when" of autonomous vehicle (AV) adoption is of clear interest to car manufacturers, but also to transportation planners and traffic engineers. In this thesis, individual-level AV adoption and the timing of this process were examined, considering the psychosocial factors of driving control, mobility control, safety concerns, and tech-savviness. The results underscore the need to examine the adoption of technology through a psychosocial lens: technology developments and design should not be divorced from careful investigation of the habits and consumption motivations of different groups of individuals in the population. The analytical findings are translated into specific policy actions to promote AV adoption and accelerate the adoption timeframe.

Benjamin Bauchwitz

Duke University

Collaborative Sciences Center for Road Safety (CSCRS) led by the University of North Carolina, Chapel Hill

benjamin.bauchwitz@duke.edu

Bio

Ben Bauchwitz is a second-year Computer Science PhD student in the Humans and Autonomy Lab at Duke University. His interests lie at the intersection of artificial intelligence (AI), human-computer interaction, human factors, and psychology. Ben's research focuses on developing a robust framework for certifying and validating the behavior of autonomous systems, particularly those used in partially automated vehicles. Prior to Duke, Ben conducted intelligent systems research and development at Charles River Analytics in Cambridge, MA. He received his bachelor's degree in Brain and Cognitive Science from MIT in 2015.

Degree and Graduation Date (or Anticipated Date)

PhD in Computer Science from Duke University, spring 2023

B.S. in Brain and Cognitive Sciences from the Massachusetts Institute of Technology (MIT), 2015

Preferred Career after Graduation

Ben intends to pursue a career in the public and/or private sectors.

Broad Research Interest Area

Transportation policy; Intelligent Transportation Systems

Specific Research Area

Technology, methods, and analytics for certification of autonomous vehicles

Primary Mode(s)

Road

Top Accomplishment in 2020

Ben designed, executed, and evaluated a study assessing performance variability in the Tesla Model 3 driver monitoring system. This study revealed significant within- and between-vehicle variability on certain metrics, and provided evidence for a vulnerability in which sun angle systematically influences vehicle response to loss of lane markings.

Thesis Title and Summary

"Formal Methods for Rigorous Autonomous Systems Certification"

Current vehicle testing practices rely heavily on a limited number of observations of vehicle performance, and testing for complex ADAS systems is extremely limited. Ben's research seeks to formally bound the type and number of scenarios that must be evaluated to ensure complete coverage in testing. Additionally, Ben is developing analytic tools using computer vision and other techniques so that greater amounts of information can be captured from the limited number of observations available.

Maha Elouni

Virginia Tech

Urban Mobility & Equity Center led by Morgan State University

emaha@vt.edu

Bio

Maha Elouni is currently a graduate research assistant with the Center for Sustainable Mobility in the Virginia Tech Transportation Institute at Virginia Tech. Her research interests include traffic flow control, traffic modeling and simulation, and Intelligent Transportation Systems. Combining traffic light data with traffic density and vehicle sensors has enabled her to create a digital model that can control traffic light signaling as well as vehicle speed to maximize flow from one point to another.

Degree and Graduation Date (or Anticipated Date)

PhD in Computer Engineering from Virginia Tech, 2021

M.S. in Applied Mathematics from Virginia Tech, 2015

M.Sci. and B.Sci. in Computer Science from the National School of Computer Sciences (ENSI), University of la Manouba, 2012

Preferred Career after Graduation

Maha will seek a career in academia.

Broad Research Interest Area

Traffic engineering

Specific Research Area

Traffic flow and speed control for urban networks

Primary Mode(s)

Road

Top Accomplishment in 2020

Maha had two articles published in IEEE journals (IEEE Access and IEEE Transactions on Intelligent Transportation). Additionally, she earned the Future Professoriate Certificate, a key feature of Virginia Tech's Transformative Graduate Education initiative.

Thesis Title and Summary

"Traffic Flow and Speed Control on a Large-Scale Network with the Geographical Self-Organizing Maps (Geo SOM) Clustering Algorithm"

Different traffic flow control strategies were developed and implemented on an urban network to reduce network congestion. A new speed harmonization controller, based on sliding mode control, was developed and tested on Los Angeles freeways. Identification of congested areas using machine learning techniques was conducted.

Patrick Emami

University of Florida

Southeastern Transportation Research, Innovation, Development and Education Center

patrickemami@gmail.com

Bio

Patrick Emami is currently in the fifth year of his Computer Science PhD program at the University of Florida (UF). Patrick is a research assistant with the UF Transportation Institute and with the Modern Artificial Intelligence and Learning Technologies (MALT) Lab. He attended courses on advanced machine learning at the 2019 London Machine Learning Summer School (MLSS). In summer 2018, he volunteered with the UF Student Science Training Program (SSTP) to teach an introductory course on machine learning to rising high school seniors. He has mentored many undergraduate and graduate students on computer vision projects since 2017.

Degree and Graduation Date (or Anticipated Date)

PhD in Computer Science from the University of Florida, summer 2021

M.S. in Computer Science from the University of Florida, spring 2021

B.S. in Computer Engineering from the University of Florida, May 2016

Preferred Career after Graduation

Patrick will pursue a career in the private sector after receiving his PhD.

Broad Research Interest Area

Intelligent Transportation Systems

Specific Research Area

Computer vision for traffic scene understanding

Primary Mode(s)

Road

Top Accomplishment in 2020

Patrick published a survey in the August 2020 issue of "ACM Computing Surveys" on machine learning (ML)-based approaches to data association for multi-object tracking.

Thesis Title and Summary

"On Representation Learning for Multi-Object Video Understanding"

This thesis proposes new deep learning models (both generative and discriminative) that learn representations from multi-object video for downstream tasks. Videos with multiple interacting objects are challenging for current computer vision systems. Initially, we introduce a practical convolutional neural network that jointly learns object detection and object re-identification. We evaluate the model at a traffic intersection and fuse its predictions with Doppler radar to increase its field of view. While object tracks are a useful video representation for a variety of applications, ideally we would like a more general and robust representation that can be learned without requiring human supervision. We propose a new class of unsupervised deep models that automatically construct highly structured object-centric representations from real-world video that can be used for both inference and generation.

Sydney James

University of Nebraska-Lincoln

Mid-America Transportation Center

sydney.james@huskers.unl.edu

Bio

Sydney James completed a bachelor's degree in Civil Engineering in 2019 at the University of Nebraska-Lincoln (UNL) and is currently a graduate student there. While attending UNL, Sydney worked on research pertaining to transportation safety for vehicles transporting hazardous material in rural and tribal areas. Sydney interned with the Mid-America Transportation Center (MATC) at UNL developing and teaching curriculum for engineering and transportation based outreach programs intended for students generally underrepresented in STEM fields. Additionally, Sydney served as a MATC Programing Mentor for an engineering and transportation after school program for local middle school students, giving direction and guidance for STEM-themed activities.

Degree and Graduation Date (or Anticipated Date)

M.S. in Civil Engineering from the University of Nebraska-Lincoln, May 2021

B.S. in Civil Engineering from the University of Nebraska-Lincoln, May 2019

Preferred Career after Graduation

Sydney will seek a career in the public or private sector after completing her master's degree.

Broad Research Interest Area

Transportation planning; traffic engineering

Specific Research Area

Transportation safety for vehicles transporting hazardous material in rural and tribal areas

Primary Mode(s)

Road

Top Accomplishment in 2020

Sydney's research paper, "Identifying Underreported Crash Data on Native American Reservations: A Case Study of Thurston County, Nebraska," was accepted for presentation at the 2021 TRB Annual Meeting. She will bring attention to a wider audience regarding transportation issues on Native American Reservations.

Thesis Title and Summary

"Risk and Safety Associated with Hazardous Materials Transport: A Case Study of Rural and Native American Communities in Nebraska"

Rural areas and Native American Reservations often lack planning and preparedness for responding to hazardous material (HAZMAT) spills, which can be devastating to these communities. To reduce this risk of crashes involving vehicles transporting HAZMAT, this thesis identifies geographic areas that are at an increased risk through a search to determine crash history and the factors that contribute to such crashes. Once these areas have been identified, countermeasures will be suggested to decrease the risk of a crash. A decision template will also be produced at the conclusion of this research.

Trevor Looney

The University of Oklahoma

Accelerated Bridge Construction University Transportation Center (ABC-UTC) led by Florida International University

trevor.j.looney@ou.edu

Bio

Trevor Looney is a PhD candidate in the School of Civil Engineering and Environmental Science at the University of Oklahoma (OU). He earned his bachelor's and master's degrees from Missouri University of Science and Technology in Rolla, Missouri. After working for Wallace Engineers in Tulsa, Oklahoma, he enrolled at OU to pursue a PhD in structural engineering with research focused on ultra-high performance concrete (UHPC). Trevor has contributed to three interconnected research projects developing non-proprietary UHPC that are being coordinated by the Accelerated Bridge Construction University Transportation Center (ABC-UTC).

Degree and Graduation Date (or Anticipated Date)

PhD in Civil Engineering—Structural Engineering Emphasis from the University of Oklahoma, December 2021

M.S. in Civil Engineering—Structural Engineering Emphasis from Missouri University of Science and Technology, December 2012

B.S. in Civil Engineering from Missouri University of Science and Technology, December 2010

Preferred Career after Graduation

Upon completion of his doctorate, Trevor will pursue a career in public-sector research and development.

Broad Research Interest Area

Infrastructure systems

Specific Research Area

Multiaxial stress behavior of and constitutive models for non-proprietary UHPC intended for bridge infrastructure

Primary Mode(s)

Road

Top Accomplishment in 2020

Trevor was a major contributor to three interconnected research projects focused on UHPC: the ABC-UTC's Non-Proprietary UHPC Mix project; the development of the original non-proprietary mix at OU that became the foundation of the other UHPC Mix projects; and the matching Oklahoma Department of Transportation project. He also co-authored two journal papers.

Thesis Title and Summary

"Tensile Failure Criteria of Ultra-High Performance Concrete at Different Fiber Percentages"

This research is an experimental and analytical investigation of the multi-axial stress behavior of UHPC. The results of this testing will be used to determine generalized failure criteria for UHPC materials. The proposed failure criteria will be verified using experimental results and finite element analysis.

Daniel McCabe

University of Washington

Connected Cities for Smart Mobility towards Accessible and Resilient Transportation (C2SMART) Center led by New York University

danmccabe17@gmail.com

Bio

In between receiving his bachelor's degree from Harvey Mudd College in 2017 and enrolling at the University of Washington (UW), Daniel McCabe worked for two years as a research associate at Pacific Northwest National Laboratory. There he contributed to optimization-related projects with applications in power systems and national security. As a researcher now at UW, Dan is interested in using methods from operations research to guide better decision making for transportation systems. He hopes his future work will help harness new technologies' potential to improve the efficiency, sustainability, and equity of transportation systems.

Degree and Graduation Date (or Anticipated Date)

PhD in Civil Engineering from the University of Washington, June 2024

M.S. in Civil Engineering from the University of Washington, June 2021

B.S. in Engineering from Harvey Mudd College, May 2017

Preferred Career after Graduation

Dan will continue on at UW for his PhD, and then pursue a career in academia or the public sector.

Broad Research Interest Area

Infrastructure systems; Intelligent Transportation Systems

Specific Research Area

Transportation network optimization; electric vehicles

Primary Mode(s)

Road

Top Accomplishment in 2020

Dan had two papers (one as first author) accepted for presentation at the 2021 Transportation Research Board (TRB) Annual Meeting.

Thesis Title and Summary

"Optimization Model for Battery-Electric Bus Charging Infrastructure"

This thesis develops a mathematical programming model to identify optimal sites for battery-electric bus charging stations. The model balances real-world detail with computational efficiency, and relies primarily on standardized, readily available data in the general transit feed specification (GTFS) format to enable its easy application to different bus networks. A case study developed in collaboration with King County MetroTransit illustrates the model's usefulness for an upcoming electric bus fleet conversion in South King County, WA, and quantifies its impact with a detailed simulation.

Cadence Motley

University of Nevada at Reno

INSPIRE University Transportation Center led by Missouri University of Science and Technology

cmotley@nevada.unr.edu

Bio

Cadence Motley is currently pursuing a master's degree in Computer Science and Engineering at the University of Nevada (UNR). Conducting her research in the UNR Advanced Robotics and Automation Laboratory, and designing and fabricating next-generation robots that can aid bridge inspectors in condition assessment and load rating. Cadence is also a teaching assistant for mechanical engineering seniors during their capstone design projects, and she volunteers for local STEM events. Most recently, Cadence was a judge for the statewide Nevada FIRST® Tech Challenge robotics championship for students in grades 7–12.

Degree and Graduation Date (or Anticipated Date)

M.S. in Computer Science and Engineering from the University of Nevada, Reno, May 2021

B.S. in Mechanical Engineering from the University of Nevada, Reno, May 2019

Preferred Career after Graduation

Cadence intends to pursue a PhD, and then seek a career in the private sector.

Broad Research Interest Area

Infrastructure systems; Intelligent Transportation Systems

Specific Research Area

Robotics research

Primary Mode(s)

Road

Top Accomplishment in 2020

Cadence's work was recognized and published by the 2020 IEEE International Conference for Robotics and Automation (ICRA), the flagship, largest, and most highly reputed conference in robotics.

Thesis Title and Summary

"Climbing Robot Design, Development, and Manufacturing for Steel Bridge Inspection"

This master's thesis focuses on the research and development of a robust and reliable robot that is capable of carrying very large equipment loads without sacrificing mobility. This robot functions with an embedded NORTEC 600 eddy current sensor and GoPro that allow it to conduct nondestructive evaluations and collect high-resolution imagery data of steel structures. The data are processed into a heatmap for quick and easy interpretation by the user. In order to verify the robot's designed capabilities, a set of mechanical analyses were performed to quantify its limits and failure mechanics. This robot will help increase the safety of inspections by reducing the frequency at which a human inspector would need to hang underneath a bridge or travel along a narrow section.

Abdullah Jalal Nafakh

Purdue University

Center for Connected and Automated Transportation (CCAT) led by the University of Michigan

ajnafakh@purdue.edu

Bio

Abdullah Nafakh completed both his bachelor's and master's degrees in Civil Engineering in 2016 and 2017 at Purdue University. He then worked for two years as a roadway engineer in Indianapolis, Indiana, during which time he was involved in designing several roundabouts across the state. In 2019, Abdullah returned to Purdue University to pursue a PhD in Transportation Engineering. Abdullah's research at Purdue focuses on vehicle-pedestrian interactions and investigating alternative designs to accommodate all road users.

Degree and Graduation Date (or Anticipated Date)

PhD in Transportation Engineering from Purdue University, May 2022

M.S. in Civil Engineering (MSCE) from Purdue University, December 2017

B.S. in Civil Engineering, from Purdue University, May 2016

Preferred Career after Graduation

Abdullah intends to pursue a consulting career after completing his doctoral studies.

Broad Research Interest Area

Traffic engineering

Specific Research Area

Pedestrian infrastructure to improve safety

Primary Mode(s)

Road

Top Accomplishment in 2020

Abdullah was first author in the technical report "Assessment of an Offset Pedestrian Crossing for Multi-Lane Arterials" to be published in the Joint Transportation Research Program in late 2020.

Thesis Title and Summary

"Optimal Selection of Pedestrian Crossing Treatments"

Often the selection of a pedestrian crossing treatment is based off of surrounding motorist characteristics. However, this study considers optimal selection based on pedestrian characteristics.

Campbell Neighborgall

Virginia Tech

Improving Rail Transportation Infrastructure Sustainability and Durability (RailTEAM) led by the University of Nevada, Las Vegas

campben@vt.edu

Bio

Campbell Neighborgall's current research focuses on the rollover propensity of heavy commercial trucks with double trailers, with and without a roll-stability control system. He previously researched laser-based methods for quantifying levels of top-of-rail friction modifiers on railroad tracks. Campbell was awarded the Dwight D. Eisenhower Transportation Fellowship in 2018. During his undergraduate education, Campbell completed internships with Ford and Toyota and played a critical role in multiple vehicle-based undergraduate design teams.

Degree and Graduation Date (or Anticipated Date)

PhD in Mechanical Engineering from Virginia Tech, December 2021

Bachelor's degree in Mechanical Engineering from Virginia Tech, May 2018

Preferred Career after Graduation

Campbell will seek a career in the public sector, private sector, and/or consulting.

Broad Research Interest Area

Intelligent Transportation Systems; freight

Specific Research Area

Roll stability of heavy trucks; vehicle dynamic-control system testing; long-combination vehicle maneuverability; sensor fusion

Primary Mode(s)

Road

Top Accomplishment in 2020

Campbell successfully co-led an extensive evaluation of the rollover propensity of 33-ft A-double trailers. He was project manager and lead designer for all things electrical, including the selection and installation of analog and digital sensors, design of a braking robot, and tuning of a custom steering robot.

Thesis Title and Summary

"An Investigation on Low-Speed Off-Tracking, High-Speed Roll-Stability, and Brake Type Performance of Class 8 Trucks with 33-ft A-Double Trailers"

This study evaluated three challenges associated with the rollover propensity of large double-trailer trucks (low-speed maneuverability, high-speed roll stability, and the influence of brake type on vehicle performance) and their potential mitigation. Maneuverability was assessed using three unique tractor-trailer configurations. The high-speed rollover segment of this study evaluated the performance of a brake-based, trailer roll-stability control (RSC) system. A pneumatic actuator was added to the existing robotic steering controller so that full or partial brake pressure could be activated through a maneuver. Steering and braking robotics provided accurate and repeatable conditions for comparing rollover propensity, with and without RSC, and for comparing the brake-based RSC's performance using drum and disc brakes.

Samuel (Sam) Ricord

University of Washington (UW)

Center for Safety Equity in Transportation (C-SET) led by the University of Alaska Fairbanks

samuelsr@uw.edu

Bio

Sam Ricord completed his bachelor's degree in the Department of Civil and Environmental Engineering at the University of Washington (UW) in June 2019. Sam has continued his education at UW, completing his master's degree a year later, and is now pursuing a PhD in Civil Engineering. He has worked in UW's Smart Transportation Applications and Research Laboratory (STAR Lab) under founding director Professor Yinhai Wang since 2018. Sam's initial research dealt with Bluetooth and WiFi sensing of mobile devices. Because of a lifelong passion for social justice, his focus is now traffic safety and transportation justice.

Degree and Graduation Date (or Anticipated Date)

PhD in Civil Engineering from the University of Washington, June 2022

M.S. in Civil Engineering from the University of Washington, June 2020

B.S. in Civil Engineering from the University of Washington, June 2019

Preferred Career after Graduation

Sam is seeking a career in academia.

Broad Research Interest Area

Transportation planning; Intelligent Transportation Systems

Specific Research Area

Traffic safety; smart sensing; rural transportation planning; transportation justice

Primary Mode(s)

Multimodal

Top Accomplishment in 2020

Sam was lead author on a paper accepted for presentation at the American Society of Civil Engineers (ASCE) International Conference on Transportation and Development (ICTD) 2020.

Thesis Title and Summary

"Impact of Homeless Encampments on State Department of Transportation Right of Way"

Homeless encampments along state highway rights-of-way are a pressing issue for state departments of transportation (DOTs), because these camps pose many safety and equity concerns for the operations and maintenance of these roadways. Currently, state DOTs often lack written policies on best practices for interacting with these encampments. Further interdepartmental communication is needed to ensure that this pressing issue is addressed effectively and equitably by state DOTs.

Emiliano Ruiz

The University of Texas at El Paso

Center for Transportation, Environment, and Community Health (CTECH) led by Cornell University

emiruiz98@gmail.com

Bio

Emiliano Ruiz is currently in the Civil Engineering master's program at the University of Texas at El Paso (UT El Paso). Emiliano has interned at CTECH and with the National Science Foundation International Research Experience for Students (IRES) program. He has served as an officer for the student chapters of the Institute of Transportation Engineers, Intelligent Transportation Systems-America, and the National Society of Professional Engineers. Emiliano was selected as a Transportation Research Board (TRB) Minority Student Fellow for 2019-2020.

Degree and Graduation Date (or Anticipated Date)

M.S. in Civil Engineering from the University of Texas at El Paso, May 2021

B.S. in Civil Engineering from the University of Texas at El Paso, December 2019

Preferred Career after Graduation

Emiliano will seek a career in the private sector.

Broad Research Interest Area

Transportation planning.

Specific Research Area

Parking, simulation, and health impacts of transportation

Primary Mode(s)

Road

Top Accomplishment in 2020

As a TRB Minority Student Fellow, Emiliano presented a research paper in 2020 at TRB's Annual Conference—one of only 17 out of the 177 Minority Student Fellows in the history of the program to have had a paper published in Transportation Research Record (TRR), the Journal of the Transportation Research Board.

Thesis Title and Summary

"Assessing the Impacts of Health Benefits and Carbon Footprint in Student Parking Decisions at a University Campus"

A student's choice of parking location on campus affects the vehicle's level of carbon dioxide emissions and determines the walking distance to the final destination. This thesis examines three contributors to a university student's choice of parking location: parking permit fees, the potential health benefits of walking, and the desire to reduce carbon dioxide emissions. The associated health benefits and relative contribution to carbon dioxide pollution will be estimated for each parking lot on a university campus, and then presented in a menu of choices when the student is purchasing a parking permit. A survey will be conducted to assess students' parking choices before and after the provision of these community health-related parameters.

Theodore Sjurseth

South Dakota State University

Mountain-Plains Consortium (MPC) led by North Dakota State University

Theodore.sjurseth@jacks.sdstate.edu

Bio

In 2019, Theodore Sjurseth captained South Dakota State University's (SDSU) steel bridge team, designing and constructing a bridge that brought SDSU to the AISC National Student Steel Bridge competition for the first time. He graduated that year with a bachelor's degree in Civil Engineering and a GPA of 3.91/4.0. Now enrolled in SDSU's Civil Engineering M.S. program, Theodore is continuing his academic excellence with a GPA of 4.0 while researching the seismic performance of mechanically spliced bridge columns to be used in accelerated bridge construction (ABC). His work focuses on testing eight half-scaled mechanically spliced precast bridge columns including one reference column, all subjected quasi-seismic loading.

Degree and Graduation Date (or Anticipated Date)

M.S. in Civil Engineering from South Dakota State University, May 2021

B.S. in Civil Engineering from South Dakota State University, May 2019

Preferred Career after Graduation

Theodore is planning a career in the private sector after completing his graduate studies.

Broad Research Interest Area

Infrastructure systems

Specific Research Area

Accelerated bridge construction

Primary Mode(s)

Road

Top Accomplishment in 2020

Theodore designed and tested 50-percent-scale bridge columns to develop the first-of-its-kind systematic database of mechanically spliced precast columns.

Thesis Title and Summary

"Seismic Performance of Mechanically Spliced Bridge Columns through Experimental Studies"

This project provides experimental evaluation of mechanically spliced precast bridge columns that are designed for highly seismic regions. This study evaluates the performance of bridge columns with mechanical bar splices used inside the plastic hinge region. The study will evaluate current design methods for such precast columns, and will offer practical construction detailing.

Samuel Speroni

University of California, Los Angeles

Pacific Southwest Region UTC (PSR-UTC) led by the University of Southern California

samuel.speroni@gmail.com

Bio

Sam Speroni is a PhD student in Urban Planning at the University of California, Los Angeles (UCLA) and researcher at the UCLA Institute of Transportation Studies. He completed his master's degree in Urban and Regional Planning at UCLA in June 2020. Sam's primary research interest lies at the intersection of transportation, education, and new mobility, where he looks for ways to improve equitable access to educational opportunities for vulnerable and disadvantaged student populations. Prior to UCLA, Sam was a high school English teacher and school administrator in Charlotte, North Carolina, through Teach for America.

Degree and Graduation Date (or Anticipated Date)

PhD of Urban Planning from UCLA, June 2024

Master of Urban and Regional Planning (M.U.R.P.) from UCLA, June 2020

B.A. in Urban Studies from Brown University, May 2011

Preferred Career after Graduation

Sam intends to pursue a career in academia following completion of his doctoral studies.

Broad Research Interest Area

Transportation planning; transport policy

Specific Research Area

School transportation; travel behavior; transportation equity; politics and finance

Primary Mode(s)

Road

Top Accomplishment in 2020

Sam was selected to present at the annual meeting of the Transportation Research Board, the annual conference of the Association of Collegiate Schools of Planning, and TRB's Sustainability and Emerging Technologies in Transportation virtual forum. He was also selected to the Eno Future Leaders Development Conference 2020 cohort.

Thesis Title and Summary

"School Transportation Equity for Vulnerable Student Populations through Ridehailing: An Analysis of HopSkipDrive and Other Trips to School in Los Angeles County"

Federal education legislation protects the right to school transportation for vulnerable student populations. Many of these trips are atypical and pose challenges for schools in providing them. Ridehailing offers a solution to this problem. HopSkipDrive, a ridehailing company designed to transport children, contracts with school districts and county governments to provide school transportation for these vulnerable students. This service has important social equity implications beyond just time savings, as HopSkipDrive contract trips tend to originate in neighborhoods with high percentages of low-income households and people of color.

Christian Viniarski

University of Delaware

Center for Integrated Asset Management for Multimodal Transportation Infrastructure Systems (CIAMTIS) led by Pennsylvania State University

cnv@udel.edu

Bio

Christian Viniarski is completing a master's degree in Civil Engineering at the University of Delaware, specializing in structural engineering. His research, supported by CIAMTIS, focuses on the use of carbon fiber reinforced polymer (CFRP) to strengthen concrete structures. He completed a bachelor's degree in Civil Engineering in 2017 at Penn State and worked as a structural engineer before joining the graduate program at the University of Delaware.

Degree and Graduation Date (or Anticipated Date)

M.S. in Civil Engineering from the University of Delaware, May 2021

B.S. in Civil Engineering from The Pennsylvania State University, May 2017

Preferred Career after Graduation

Christian intends to pursue a PhD after completing his master's degree, and then will pursue a career in consulting or the private sector.

Broad Research Interest Area

Infrastructure systems

Specific Research Area

Carbon fiber reinforced polymers and concrete structures

Primary Mode(s)

Road

Top Accomplishment in 2020

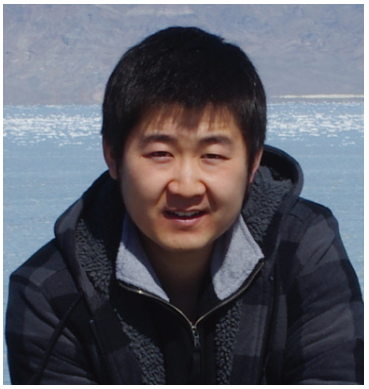
Christian's report to the American Concrete Institute (ACI) Committee 440, titled "U-wrap Anchorage Contribution to Beam Moment Strength," resulted in modification of ACI's proposed design guidance document.

Thesis Title and Summary

"Design of Anchors for Rapid and Durable Strengthening of Bridges with Externally Bonded Carbon Fiber Reinforced Polymers"

Carbon fiber reinforced polymer has become an increasingly popular material used to externally strengthen concrete members in buildings, bridges, and parking garages. This is due to CFRP's ability, when applied to structural concrete members, to increase their ultimate strength capacity, ductility, and stiffness. Furthermore, CFRP involves a relatively easy installation process, allowing it to be used in projects where rapid repair and structural strengthening are required. CFRP offers many benefits, such as having a high tensile strength-to-weight ratio and requiring minimal maintenance over its service life, compared to existing strengthening methods. CFRP is also a non-corrosive material that can be used to strengthen structures prone to corrosion-related deterioration (i.e., bridges and parking garages).

Yan Zhang



Washington State University

National Center for Transportation Infrastructure Durability & Life-Extension

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Bio

Yan Zhang contributed to research related to concrete, asphalt pavement, snow/ice control, and metallic corrosion while a project assistant at the Western Transportation Institute in 2012–2015. At Washington State University (WSU) in 2016, he developed an ultrathin nacre-biomimetic coating with super-anticorrosion performance, which was published in ACS Nano. Now with the National UTC TriDurLE, Yan has focused his dissertation on the development and modeling of durable anti-icing asphalt pavement. Yan is also a certified technician at the AASHTO-accredited Washington Center for Asphalt Technology.

Degree and Graduation Date (or Anticipated Date)

PhD in Transportation Engineering from Washington State University, January 2021

B.Sci. in Industrial Engineering from Hebei Polytechnic University, 2008

Preferred Career after Graduation

Yan is planning a career in the public or private sector.

Broad Research Interest Area

Infrastructure systems; materials

Specific Research Area

Anti-icing pavement, snow and ice control, environmentally friendly pavement, sustainable materials, and metallic corrosion

Primary Mode(s)

Road

Top Accomplishment in 2020

Yan was first author of a review article to be published in the Journal of Transportation Engineering, Part B: Pavements, titled "A Review on Anti-Icing Asphalt Pavement with Salt-Storage Additive."

Thesis Title and Summary

"Development, Assessment, and Modeling of an Anti-Icing Asphalt Pavement"

Asphalt pavement incorporating salt-storage additive is an effective anti-icing asphalt pavement used for winter road maintenance in cold regions. However, such pavement is plagued by low anti-icing capacity and effectiveness, limited anti-icing longevity, and reduced engineering properties of pavement. The research develops a novel type of functional additive for anti-icing asphalt pavement, characterizes the anti-icing performance and engineering properties of asphalt pavement with the additives, and models chloride ion transport in asphalt pavement under wet-dry cycles. This work pioneers the numerical simulation of chloride ion transport in asphalt pavement with the functional additives for anti-icing, using the finite element method.

U.S. Department of Transportation
Office of the Assistant Secretary for Research and Technology