COLLEGE OF ENGINEERING
THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

Department of

CIVIL & ENVIRONMENTAL ENGINEERING

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CHAIR'S MESSAGE

INSIDE

The demand for Civil Engineers continues to be strong. The expansion and replacement needs of infrastructure in the nation, and around the world, make this an exciting time to practice Civil Engineering. For future Civil Engineers, rest assured that the demand will continue to 2050 and beyond. Two of the grand engineering challenges—providing access to clean water, and restoring and improving urban infrastructure—directly relate to Civil Engineers. The Department of Civil & Environmental Engineering at UAH is doing it's part to produce graduates who have the technical knowledge and problem-solving skills to meet the demand.

As the new interim chair of the Department of Civil & Environmental Engineering I am new to position, but not the school. I have been at UAH for 20 years and have seen many changes, always eventually leading to advancements in the department and university. This past year, was another one of growth and change. Enrollment grew 4.1 percent for 2018 with just over 200 total students in the department. The faces always change with students graduating and moving on to new challenges and careers while making room for a new class of students to take their place in classes and on research projects. Our department saw the addition of Dr. Salman and the departure of two members, Dr. Ishak and Dr. Haleem. With all the changes, the mission of the department remains constant. It is our goal to provide an education and experience that will lead to a successful career and quality life.

I am delighted to assume the role of interim department chair and lead the department into the next decade. With the help of the students, staff, researchers, faculty, board members, alumni and constituents we will work to make the world a better place to live for future generations.

Sincerely,

Michael Anderson, Ph.D.
Interim Department Chair

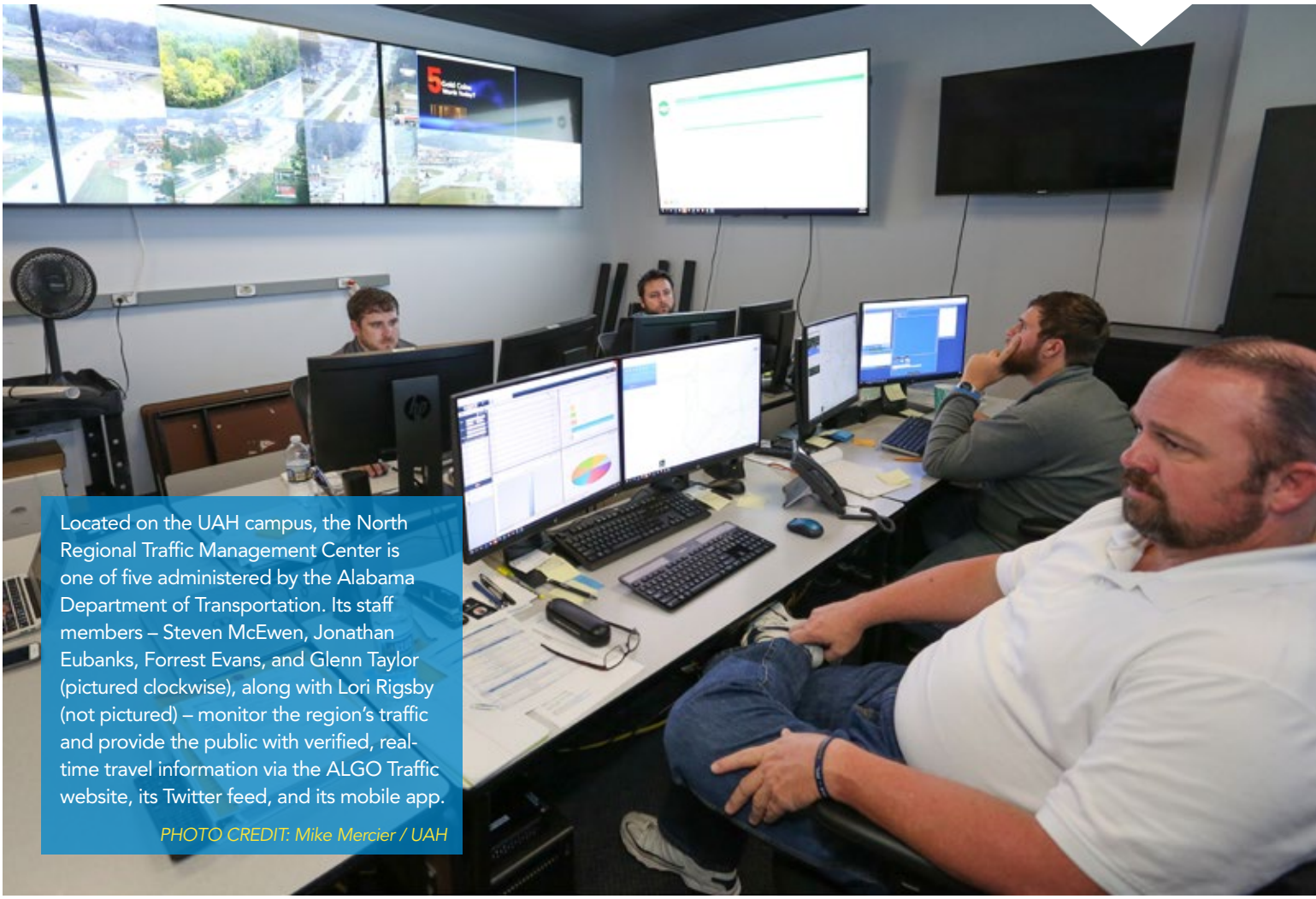
Dr. Ashraf Al-Hamdan receives the 2018 College of Engineering Outstanding Teaching Award from Dr. Shankar Mahalingam, Dean of the College of Engineering.

2018 College of Engineering Outstanding Teaching Award

Dr. Ashraf Al-Hamdan, a clinical assistant professor at UAH, has received the 2018 College of Engineering Outstanding Teaching Award. Since joining the Department of Civil & Environmental Engineering at UAH in 2007, Dr. Al-Hamdan has taught a variety of undergraduate and graduate courses in Structural, Geotechnical, Water Resources, and Environmental Engineering.

He strongly believes that teaching plays a significant role in preparing students to become passionate graduates and competent engineers. He teaches foundational courses in the Civil Engineering curriculum. The student-instructor evaluations of his courses have consistently reflected his outstanding teaching performance and effectiveness as an educator in engineering.

Dr. Al-Hamdan also received the UAH College of Engineering Outstanding Faculty Teaching Award in 2014 and was honored as the Most Outstanding Civil Engineering Professor in 2016 by Tau Beta Pi – The Engineering Honor Society. In addition to teaching, Dr. Al-Hamdan has been contributing to student advising, curricular development, student recruitment, and professional activities. For the last four years, Dr. Al-Hamdan has been serving as the Chair of the Undergraduate Committee and ABET Coordinator of the Civil Engineering Program at UAH. His current research work is related to remote sensing and GIS applications to environmental modeling and assessment of water and air quality for public health and ecological uses to improve decision-making and environmental sustainability.



Located on the UAH campus, the North Regional Traffic Management Center is one of five administered by the Alabama Department of Transportation. Its staff members – Steven McEwen, Jonathan Eubanks, Forrest Evans, and Glenn Taylor (pictured clockwise), along with Lori Rigsby (not pictured) – monitor the region's traffic and provide the public with verified, real-time travel information via the ALGO Traffic website, its Twitter feed, and its mobile app.

PHOTO CREDIT: Mike Mercier / UAH

NEW REGIONAL TRAFFIC MANAGEMENT CENTER HOPES TO PUT COMMUTER WOES IN THE REARVIEW MIRROR

It's a rainy Thursday evening in Huntsville, and you're stuck in bumper-to-bumper traffic. You can feel your blood pressure rising as you lean out the driver's side window to see just how far the line of tail lights ahead of you go on for. Was there an accident? How long is the backup? Is there any way to get around it? Just then, you remember the new app you downloaded earlier in the week. Within seconds, you're able to see that the source of the traffic jam, a moderate crash, has resulted in the closure of one lane. Law enforcement is already on the scene and working quickly to clear away the debris, but by now, you've used the app's map to identify an alternate, traffic-free route home. A few turns later, you're back up to speed and on your way.

Introducing ALGO Traffic, available for free online, via Twitter (@algo_hvl), and in the app store. "It's similar to community-based GPS navigation apps, but our information is verified rather than user submitted," says Glenn Taylor. A retired state trooper, he now manages the North Regional Traffic Management Center (TMC), one of five administered by the Alabama Department of Transportation (ALDOT). Together with his staff of four

operators – Steven McEwen, Jonathan Eubanks, Forrest Evans, and Lori Rigsby – Taylor gathers traffic information about state/federally maintained roadways from a variety of sources, including ALDOT and law enforcement cameras and radios, 911 dispatch centers, weather stations, and other official sources. The team then disseminates that information via the three aforementioned channels. "We ensure that the public can make an informed travel decision," he says.

The TMC is headquartered in Olin B. King Technology Hall on the campus of UAH, thanks to a deal struck between ALDOT and Dr. Michael D. Anderson, interim chair of UAH's Department of Civil & Environmental Engineering. "They contacted me because their West Central Regional TMC is located at a university and they thought it would be a good fit," says Dr. Anderson, a longtime ALDOT collaborator. "So we provide the space for them, and in return, we will be using the data they collect in our research efforts to better understand traffic flow. They'll also be hiring some of our students to work alongside them, giving them hands-on experience in the field."

Taylor and his team are responsible for monitoring conditions across 13 counties that make up the ALDOT's North Region: Cherokee, Cullman, Colbert, Dekalb, Etowah, Franklin, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall, and Morgan. And because four of these counties abut the Tennessee border, that includes traffic going into and out of each state. "If there's an event close to the Tennessee state line or if I-65 shuts down, we let Tennessee know that, for their travelers, anyone southbound would be detoured," he says. "And they do the same for us." The operators work in shifts, with two required to be present at any given time. That arrangement allows them to keep the center open 14 hours a day, five days a week, with coverage transferring to the East Central Regional TMC overnight and on the weekends. "We aren't able to go to 24 hours yet, but we've already extended our hours by two so far and we've hired two part-time workers, Dario Gonzalez and senior civil engineering major Katherine Holley," says Taylor.

When a traffic event does occur, the operators on staff gather the pertinent information and upload it into the TMC's proprietary system. "We take into consideration the time of day, the number of vehicles involved, the number of lanes blocked, the number of responders, and that type of thing when we determine severity," says McEwen. a transfer from the East Central Regional TMC located in the Birmingham area. What they don't do is add extraneous or subjective information. "We can put notes in the system so that the other TMC operators can go in and be updated, but we follow a template for what gets seen by the public." That information is then uploaded to the ALGO website and app, and automatically tweeted out on the TMC's Twitter feed.

For McEwen, the job has proven to be a singular offshoot from his previous career as a traffic investigator for the U.S. Army. "Sometimes I miss it but there's a lot more to traffic management than I ever understood or realized," he says. "Since I've gotten here, it's grown on me even more." The same is true for Eubanks, a former patrol officer. "It's nice just to have a little change of pace compared to patrol work," he says. "It's a different side of working accidents and getting information to the public." As for the newest member of the team, Evans, he's hard pressed to explain how he ended up at the TMC after working at a juvenile detention center for most of his adult life. "I can't tell you what exactly drew my eye, but it seemed interesting and I have not been let down," he says with a laugh. "I like seeing how things impact the flow of traffic and being able to help people not be stressed out on their commute."

"I like seeing how things impact the flow of traffic and being able to help people not be stressed out on their commute."

The ultimate hope is that, together with UAH, the TMC won't just help alleviate stress on the region's commuters; it will also help ameliorate the flow of traffic so as to reduce the source of that stress. "The interaction between traffic managers and traffic researchers will allow for an improved understanding of travel behavior and congested travel conditions," says Dr. Anderson of the symbiotic relationship between the two. "The ultimate goal is to provide travelers improved information at present, while assisting in determining the future travel and infrastructure needs to reduce congestion in the years ahead."

ACHIEVEMENTS & AWARDS

Amir Ahamdi

Amir Ahamdi, a Ph.D student in the department of Civil & Environmental Engineering at UAH received a prestigious award from the Alabama Program to Stimulate Competitive Research (ALEPSCoR) Graduate Research Scholars Program (GRSP). His research focuses on electrochemical methods for water/wastewater treatment. (Advisor: Dr. Tingting Wu)

Thanh Chi Vu

Thanh Chi Vu, a Ph.D student in the department of Civil & Environmental Engineering at UAH received a prestigious award from the Alabama Program to Stimulate Competitive Research (ALEPSCoR) Graduate Research Scholars Program (GRSP). His research focuses on development of low-cost, multifunctional adsorbents for water quality control. (Advisor: Dr. Tingting Wu)

Dr. Mehrnaz Doustmohammadi

Dr. Mehrnaz Doustmohammadi graduated with her doctoral degree in Civil Engineering in December 2018. Her dissertation topic was titled "Investigating the Factors Contributing to a Crash Severity Level and Crash Frequency in Rainy Weather and Wet Pavement Conditions Using Statistical Modeling Techniques for the State of Alabama." Dr. Doustmohammadi currently works for UAH as a research scientist working on several projects as primary investigator for the Alabama Department of Transportation (ALDOT) and the University of Alabama. Some of her projects include training bus drivers using a RIDE simulator for the state of Alabama and performing intersection crash analysis for ALDOT.

GET TO KNOW YOUR FUTURE CIVIL ENGINEERS

Aaditya Pillaipakkam Bahukuddumbi

Aaditya PB is a recent Ph.D. graduate that studied transportation engineering. He has worked as both a graduate assistant and teaching assistant enjoys sharing his knowledge of various Civil Engineering topics. When he isn't discussing traffic analysis and geometric roadway designs, he is participating in his favorite hobby, soccer and he currently plays in the Huntsville Men's Soccer League. Aadtiya also shows strong leadership and communications skills in the Indian Student Organization, of which he has been president from 2017 until graduating in December 2018.

Emma Donnelly-Bullington

Emma Donnelly-Bullington is a senior Civil & Environmental Engineering student from Memphis, TN. She loves that the department has a small student-to-teacher ratio. This has allowed her to have the same professors and have a real personal connection to her education. In the past, Emma has worked in the College of Engineering as a peer mentor for the First-Year Experience class and as an Engineering Ambassador. Emma is currently the President of the UAH Section of the Society of Women Engineers. She has traveled across the country to many SWE conferences, allowing her to network with others giving her the opportunity to share creative ideas and concepts.

Colsten Thompson

Colsten Thompson is a senior Civil Engineering student. This past summer, Colsten worked his first internship with the Alabama Power Company in Birmingham, AL. This position allowed him to take the knowledge he learned in the classroom and able to apply it to a real-world scenario. Colsten spent three years playing college basketball, then played professionally for a year in the North American Basketball League. He still uses his talents on the court as a student assistant coach for the UAH Women's Basketball team.

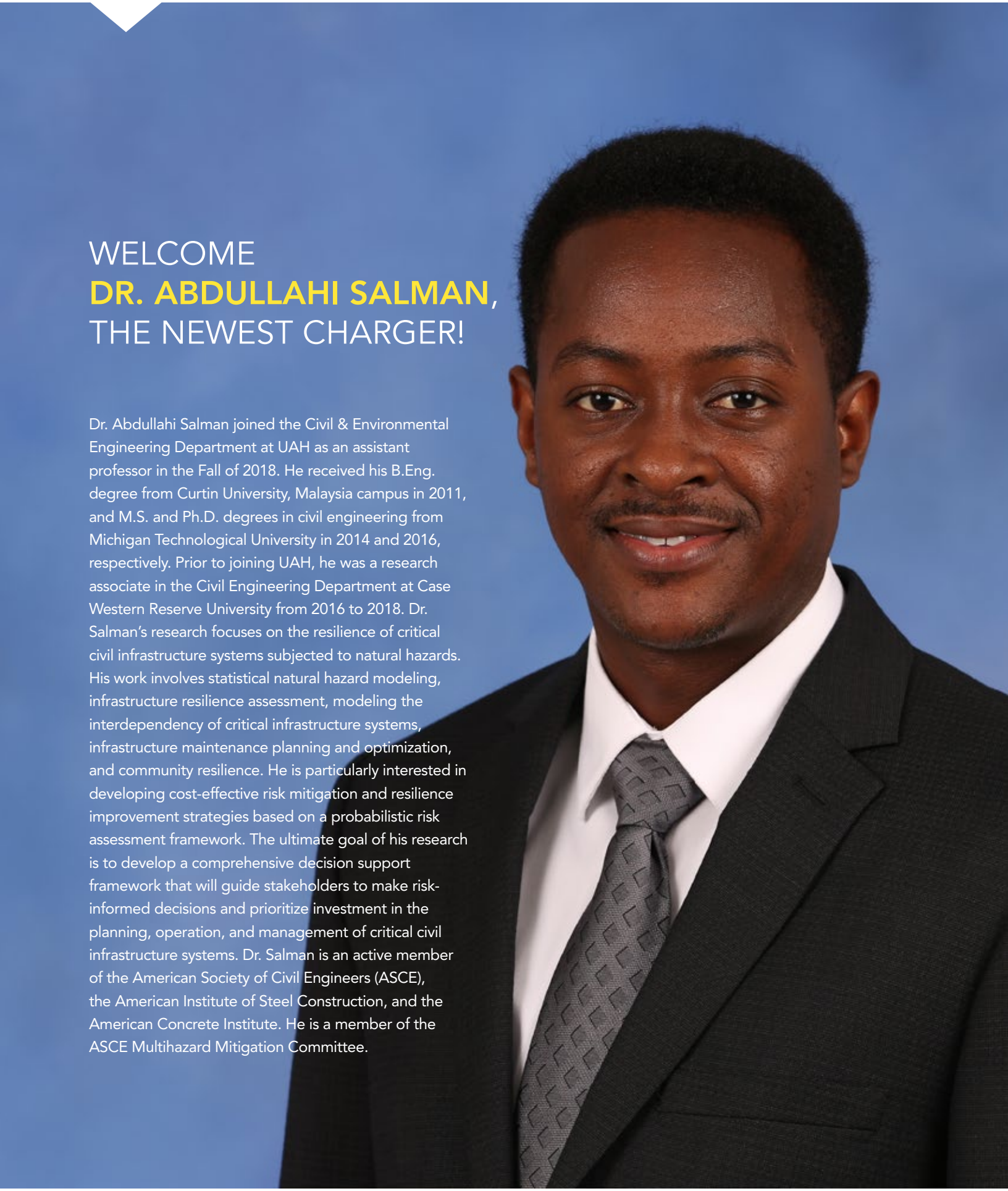
Pooja Parathy Preetha

Pooja Parathy Preetha is currently in her third year as a Ph.D. student in Civil & Environmental Engineering. Her main concentration is remote sensing and soil erosion. She has had her work in two journal publications and a conference publication. In between all her research, she still finds time to get lost in a wonderful book or dance the night away.

Lisa Lugo Kuzy

Lisa Lugo Kuzy is a graduate student from Paraguay, currently doing her second semester in the doctoral program and researching in traffic safety analysis. She earned her bachelor's degree in Civil Engineering at the National University of Asuncion, Paraguay, and she completed her masters in Civil Engineering at the University of Maryland at College Park. For several years, she worked and researched in the geotechnical field in her home country and has published in conferences in Latin America. Before moving to the U.S., Lisa was a Professor in the Civil Engineering Department at the Catholic University of Asuncion. She is also a mother of three and an advocate for kids with special needs.

WELCOME **DR. ABDULLAHI SALMAN**, THE NEWEST CHARGER!



Dr. Abdullahi Salman joined the Civil & Environmental Engineering Department at UAH as an assistant professor in the Fall of 2018. He received his B.Eng. degree from Curtin University, Malaysia campus in 2011, and M.S. and Ph.D. degrees in civil engineering from Michigan Technological University in 2014 and 2016, respectively. Prior to joining UAH, he was a research associate in the Civil Engineering Department at Case Western Reserve University from 2016 to 2018. Dr. Salman's research focuses on the resilience of critical civil infrastructure systems subjected to natural hazards. His work involves statistical natural hazard modeling, infrastructure resilience assessment, modeling the interdependency of critical infrastructure systems, infrastructure maintenance planning and optimization, and community resilience. He is particularly interested in developing cost-effective risk mitigation and resilience improvement strategies based on a probabilistic risk assessment framework. The ultimate goal of his research is to develop a comprehensive decision support framework that will guide stakeholders to make risk-informed decisions and prioritize investment in the planning, operation, and management of critical civil infrastructure systems. Dr. Salman is an active member of the American Society of Civil Engineers (ASCE), the American Institute of Steel Construction, and the American Concrete Institute. He is a member of the ASCE Multihazard Mitigation Committee.

Publications

Al-Hamdan, A.Z., Preetha, P.P., Al-Hamdan, M.Z., Crosson, W.L., and Albashaireh, R.N. (2018) "Reconnoitering the linkage between cardiovascular disease mortality and long-term exposures to outdoor environmental factors in the USA using remotely-sensed data," *Journal of Environmental Science and Health: Part A-Toxic/Hazardous Substances & Environmental Engineering, 53(9), 809–818.*

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Preetha, P.P., Al-Hamdan, A.Z., and Anderson, M. (2018). "Assessment of the Impact of Land Cover and Land Use Changes on the Water Quality of Sediments and Nutrients in Cahaba River Basin Using SWAT," *International Conference on Environmental Science and Technology 2018, Houston, Texas, June 25–29, 2018.*

Ahmadi, A., Yang, W., Jones, S., Wu, T. "Separation-free Al-Mg/Graphene Oxide Composites for Enhancement of Urban Stormwater Runoff Quality," *Advanced Composites and Hybrid Materials. 1 (3), 591–601, 2018.*

Wu, T., Englehardt, J., Guo, T., Gassie, L., Dotson, A. "Applicability of Energy Positive Net-Zero Water Management in Alaska: Technology Status and Case Study," *Environmental Science and Pollution Research, 25 (33), 33025–33037, 2018.*

Yang, W. and Wu, T. "Explore the mechanism of heterogeneous catalytic ozonation in different water matrices", *The 256th ACS National Meeting, August 19-23, 2018, Boston, MA.*

Kassu, A., Anderson, M.D. "Analysis of Nonsevere Crashes on Two- and Four-Lane Urban and Rural Highways: Effects of Wet Pavement Surface Condition," *Journal of Advanced Transportation. Vol. 2018. Article ID 2871451, 10 pages, 2018.*

Kesavareddy, S., Haleem, K., Doustmohammadi, M., Anderson, M.D. "Comparing the Crash Injury Severity Risk Factors at High-Volume and Low-Volume Intersections with Different Traffic Control in Alabama," *International Journal of Statistics and Applications. Vol. 8. No. 4. 2018. 173–188.*

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Kassu, A., Anderson, M.D. "Determinants of Severe Injury and Fatal Traffic Accidents on Urban and Rural Highways," *International Journal for Traffic and Transportation Engineering. Vol. 8. No. 3. 2018. 294–308.*

Doustmohammadi, M., Shirani-Bidabadi, N., Kesavareddy, S., Anderson, M.D. "The Impact of Sidewalks on Vehicle-Pedestrian Crash Severity," *International Journal of Statistics and Probability. Vol. 7. No. 4. 2018. 69–77.*

Sojaeshafiei, M., Doustmohammadi, M., Anderson, M.D. "Accuracy of Crash Data for Wet Pavement Crash Analysis," *International Journal of Traffic and Transportation Engineering. Vol. 7. No. 2. 2018. 28–31.*

Doustmohammadi, M., Anderson, M.D. "Binary Probit Crash Analysis for Various Curve and Grade Conditions," *International Journal of Statistical Applications. Vol 8. No. 2. 2018. 35–41.*

Raja, P., Doustmohammadi, M., Anderson, M.D. "Estimation of Average Daily Traffic on Low Volume Roads in Alabama," *International Journal of Traffic and Transportation Engineering. Vol 7. No 1. 2018. 1–6.*

Research Grants/ Contracts

"Alabama Transit Management System," *Sponsored by the Alabama Department of Transportation, October 1, 2018–September 30, 2020. ($2,250,000).*

"Alabama Highway Performance Monitoring System Data," *Sponsored by the University of Alabama, October 1, 2017–May 31, 2019. (152,696).*

"Performance Reviews for Section 5310 and 5311 Agencies," *Sponsored by the Alabama Department of Transportation, September 1, 2015–September 30, 2020, ($243,141).*

"Modeling Support for ALDOT and Alabama MPOs," *Sponsored by the Alabama Department of Transportation. October 2018–September 2019. ($58,000).*

"Implementing usRAP in Alabama: Coving the State – Phase 4," *Sponsored by the Alabama Department of Transportation, October 1, 2018–September 30, 2020, ($373,301).*

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