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the EXPLORER Newsletter

QUARTERLY PUBLICATION OF THE COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY AT TEXAS SOUTHERN UNIVERSITY

CONTENTS

METRO AND COSET EXPANDED RELATIONSHIP *Page 1*

NSF TARGETED INFUSION AWARD
TEXAS DOT AWARD *Page 2*

EPA P3 PHASE I AWARD
COSET SURP *Page 3*

STEM ENCHANTMENT IV
COSET CONNECT *Page 4*

FACULTY SPOTLIGHT *Page 5*

ENGINEERING PROGRAM *Page 5*

STAFF SPOTLIGHT
STUDENT SPOTLIGHT *Page 6*

ALUMNI RAVES *Page 6*

STUDENT ACCOMPLISHMENTS *Page 7*

SCHOLARLY AND CREATIVE ACTIVITIES *Page 8*

Houston METRO and COSET Plan Expanded Relationship

The chief executives of the Metropolitan Transit Authority met with the leadership of the College of Science, Engineering and Technology to set the framework for joint activities. METRO CEO, Thomas Lambert, Executive Vice President, Dr. Terence Fontaine, Government Affairs Representative, Jose Pulido, and Vice President for Human Resources, Karen Kauffman met with Dean Lei Yu, Interim Associate Dean, Oscar Criner, Transportation Studies Chair, Yi Qi, Engineering Chair, David Olowokere, and Center for Transportation Research and Training Director, Carol Lewis. The capabilities of COSET in the transportation area was recognized as a resource that could be of benefit to METRO in achieving some of their objectives for services to the community.

METRO is moving to add new features to its portfolio of services, which are state-of-the-art and will require contemporary or new technologies to create and implement. COSET has a long history in computing, information technology, and transportation studies and with the addition of its new programs in civil engineering, and electrical and computer engineering, COSET has now expanded capabilities that point to new areas of activity that are applicable to the interests of METRO. COSET's large investment in transportation can now be focused on the transportation problems of the Houston area in a collaboration with METRO. It is hoped that other institutional stakeholders can join our partnership to achieve system wide impact.

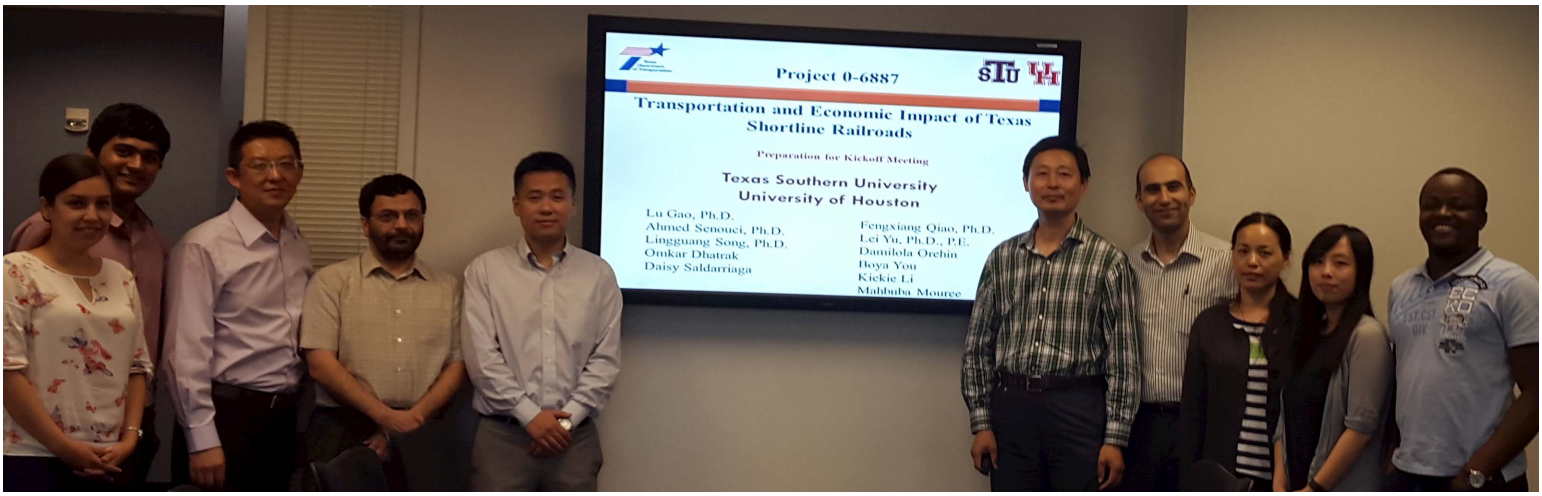
Engineering Receives National Science Foundation Targeted Infusion Project Award

The National Science Foundation (NSF) announced its 2015 Targeted Infusion Project (TIP) award to Texas Southern University to support its proposed research on "Development of a Knowledge-Based System for Integrating Artificial Intelligence into the Undergraduate Engineering Curriculum." This is a three-year grant with a total funding of $400,000. The project is under the direction of faculty members in the Department of Engineering including Drs. Yaqi Wanyan, David Olowokere, and Xumin Chen. The proposed research seeks to develop an interactive and comprehensive intelligent database to document, compare, and analyze cutting-edge Artificial Intelligence (AI) applications in the civil engineering field and use it as the platform and educational media to enrich the Department's curricula.

The project activities will impact more than 400 undergraduate students in the Department of Engineering to promote learning interests, stimulate the cognitive process, emphasize underlying engineering problem-solving activities, enhance academic infrastructure, and foster an interdisciplinary setting that reflects the multi-disciplinary nature of many engineering processes. The proposed activities will also have a significant impact on how new technologies are taught in old-fashioned engineering fields and how students learn these concepts. Furthermore, this project will produce an intelligent database, which can be used both as an educational media and a research platform. The expandable and sustainable database will enhance academic infrastructure of the COSET and increase the engineering programs' visibility.

ITRI Won a TxDOT Research Project

Texas Department of Transportation (TxDOT) is contracting with TSU for a research award 0-6887 on "Transportation and Economic Impact of Texas Shortline Railroads." The Innovative Transportation Research Institute (ITRI) at TSU is the lead university and University of Houston is the collaborating institution. Dr. Fengxiang Qiao is the Project Supervisor and PI on the TSU side, and Dr. Lei Yu is the Co-PI. The total award is $297,252, with TSU receiving $148,420. With this project, the researchers will determine detailed roles and plans for the Shortline railroad network of the State of Texas, and analyze the transportation and economic impacts of Shortline railroad operations for local communities and the entire state of Texas.



COSET Team Wins EPA P3 Phase I Award

A COSET team of faculty, Dr. Hyun-Min Hwang, Environmental and Interdisciplinary Sciences, graduate students, Matthew Fiala and Sharmila Bhandari, Environmental Toxicology PhD program, and undergraduate students, Aminata Dicko, Engineering major and Zara Uddin, Biology major received a grant of $15,000 from the US Environmental Protection Agency (EPA). This grant is for EPA's P3 (People, Prosperity, and the Planet) Phase I, which is a national college competition for designing solutions for a sustainable future. This program offers students quality hands-on experiences that brings their classroom learning to life. This team developed an idea to reduce energy consumption especially during hot summer days by installing innovative green roof as a heat insulator in commercial buildings and residential houses. This innovative green roof design includes a hydroponic plant growing system and a rainwater harvesting and recycling system. They will bring the proposed design to the National Sustainable Design Expo to compete for the P3 Phase II Award and a grant of $75,000 to take their design to real world application.

COSET Summer Undergraduate Research Program

This summer, COSET successfully completed the third Summer Undergraduate Research Program (SURP). The program was originally launched in the summer of 2013 with the primary intention of increasing enrollment of students in graduate and professional programs in Science, Technology, Engineering, and Mathematics (STEM). COSET invested substantial funding to students and faculty mentors to encourage more students to participate in SURP and improve their educational success. This year total of 25 undergraduate students and 19 faculty mentors from 7 departments participated in SURP. That is a significant increase compared to 16 student participants in the year 2013. Students worked for 10 weeks in laboratories under general and managerial supervision of Drs. Hyun-Min Hwang and Yunjiao Wang, and their mentors' close academic supervision. Students generated high quality research data in various fields. They also attended weekly workshops developed to help them better design and conduct research projects, analyze research data with statistical tools, and effectively disseminate their findings through conference presentations and journal publications. Upon completion of the program, they delivered poster and oral presentations, and prepared manuscripts that will be published in Proceedings of SURP 2015.

Student participants sequenced the mitochondrial genome of hawk-owl to determine their subspecies, utilized mathematical formula to generate aesthetic musical chords, validated the usefulness of low-cost compact earth-field NMR in measuring spin properties of various substances, studied visual awareness of rivalry images using a mathematical model, simulated performance of an electromagnetic suspension system as a new concept of space exploration vehicles, investigated causes of marine accidents in the Houston Ship Channel to reduce human errors in the future, and obtained hands-on research experience while conducting various other top notch innovative research projects.

Two surveys performed at the beginning and the end of the program show that upon completion of SURP, students are confident that they can conduct research projects without supervision of mentors, indicating they are well-trained. Students also expressed that SURP facilitated their aspirations for, and matriculations at STEM graduate programs that will significantly contribute to increased representation of African-Americans in STEM graduate programs that is currently lower than 5%.

Overall, SURP provides many benefits to students toward their success in academics and professional employment. It clearly increases retention rates of undergraduate students and connects them with graduate degrees.

CRCN STEM Enchantment IV

Adventures in Logic, Mathematics, and Games

COSET and the National Science Foundation (NSF) Center for Research on Complex Networks (CRCN) hosted its Fourth Annual STEM Enchantment Program titled: "Mobile Computing with STEM for Young People." 2015 was the most exciting year for the STEM Enchantment outreach program. Children from the sixth grade to the eleventh were all fully engaged in the program's games, mathematics, and computing activities. The objective of the program was to find a paradigm to fully engage children in STEM activities. STEM Enchantment IV was an extremely successful program because of the lessons learned in the previous years.

Since STEM Enchantment I, the focus has been on an alternative to the traditional school paradigm. We wanted to provide students with a different view of STEM and exciting summer activities. The approach was to emphasize reading in the non-textbook literature of science and mathematics, robotics and computing. Students enjoyed the program, but some said it felt too much like school. For STEM enchantment II we changed to focus on climate change. In both years, the reliance was on public school teachers to carry out the program. The enchantment idea was to be different and present an alternative notion of school and we had not yet achieved that objective.

In STEM enchantment III, the program focused on what children like to do also – and that was play games. The teacher was Professor Criner and the helpers were two undergraduate students. Computer games and programming were emphasized using Visual Basic and android programming environments.

STEM Enchantment IV greatly expanded the results of the previous year and was designed to emphasize the connection between games, mathematics, and computing.

COSET Connect Mentoring Program

The College of Science, Engineering, and Technology Office of Student Services and Instructional Support (OSSIS) has established two programs designed to help new freshmen and transfer students with the best opportunity possible to succeed in college. OSSIS is continuing its mission to help retain students within the College who may otherwise have dropped out due to poor grades or changed majors due to the rigors of a STEM program.

COSET's newest pilot program is COSET Connect which matches first generation Tigers with the Dean, Department Chairs, and faculty members to increase progression and retention among students who are the first in their families to attend college. A group of 10 students meets with a member of the COSET faculty once monthly and via email to discuss issues of concern to them and to share. Our team is eager to help students and are committed to the task. It is the goal of the program for COSET students to develop the self-motivation and self-discipline necessary to succeed in college.

Faculty Spotlight Yaqi Wanyan

Dr. Yaqi ("Yachi") Wanyan is an Assistant Professor in the Department of Engineering. She earned her B.S. in Civil and Environmental Engineering with a minor in Applied Computer Science from Tongji University (Shanghai, China). She received her M.S. and Ph.D. in Civil Engineering from the University of Texas at El Paso. Dr. Wanyan is a licensed Professional Engineer (PE) with fifteen plus years of teaching, research and consulting experience in civil, geotechnical, and transportation engineering. She started her tenure with TSU in 2011 as postdoctoral research fellow and later as visiting Assistant Professor in the Department of Engineering. Her tenure-track assistant professorship started in the Fall of 2013.

The focus of Dr. Wanyan's current research is to infuse innovative Artificial Intelligence (AI) methodologies and algorithms into traditional civil engineering problem-solving routines to bridge the knowledge gap and derive better solutions than those using conventional engineering methods. Dr. Wanyan has been actively involved in Texas Department of Transportation (TxDOT) research projects on problematic soil behavior analysis, pavement design and modeling. She is collaborating with more than six external research institutions on various federal and state research projects. Dr. Wanyan recently secured $400,000 NSF support as the Principle Investigator on a three-year project titled "Development of a Knowledge-Based System for Integrating Artificial Intelligence into the Undergraduate Engineering Curriculum." She has authored two research papers in peer- reviewed scientific journals since 2013 and presented at the most influential international transportation conferences such as the Transportation Research Board Annual Meeting 2015.

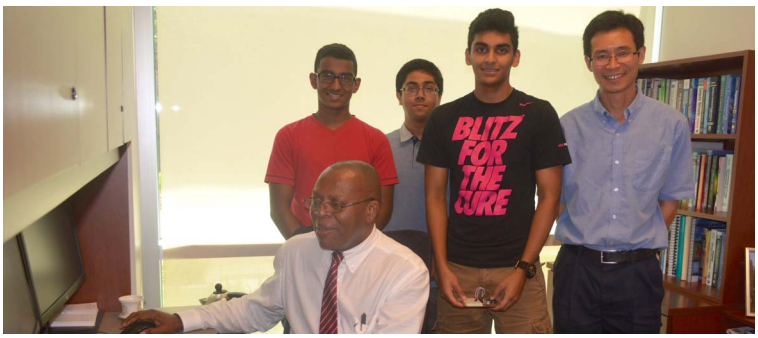
In her dual role as researcher and instructor, Dr. Wanyan teaches many core civil engineering courses ranging from freshmen introductions to senior design. She believes that it is crucial to teach students to have a life-long interest in learning. Learning ability is more than just delivering knowledge. She passionately seeks ways to enhance students' problem-solving and critical thinking skills, broaden students' horizons to include new technology, foster interdisciplinary settings to better prepare them for diverse and multidisciplinary workforce requirements, and to encourage prospective students to pursue professional engineering licensure or post-graduate studies in the engineering field.

Department Spotlight Engineering

The objective of the civil engineering program at TSU is to give students the knowledge, skills, and tools they need for an engineering career or advanced study in civil engineering. Students take a 126 credit hour plan of study to earn the bachelor's degree. Graduates are prepared to take the Fundamentals of Engineering (FE) examination which is the first part of their subsequent licensure as a professional engineer (PE).

The program provides a broad based civil engineering curriculum in structures, geotechnical, water resources, environmental, and transportation engineering, including a program designed to utilize learned technical skills, accompanied by communication skills, teamwork, and leadership qualities. This program is adequately structured to ensure graduates are employable by local, national, and international organizations. They are prepared for career with consulting engineering firms, government agencies, construction contractors and manufacturing industries. They design and build highways, bridges, water conveyance systems, water and wastewater treatment plants, dams, airports, structures and foundations for buildings, and other constructed facilities. They develop plans for managing traffic, water, air quality, flood plains, and the quantity and quality of water in streams, lakes, and reservoirs.

The TSU Civil engineering program features a two-semester co-op component. This ensures that students are equipped with strong familiarity with real-life practices before they graduate. In addition, the program is designed to assist industries and government agencies through the application of civil engineering knowledge and an understanding of infrastructure needs and problems; developing research programs with measurable results for implementation and with the expectation of improving the quality of life and economic well-being of the community.



Staff Spotlight Kimberly Scranton

Kimberly Scranton is a proud alumnus of Texas Southern University where she completed both her Bachelor of Science and Master of Science in Biology. During her graduate studies she explored whether a novel diruthenium compound, synthesized in part by TSU's chemistry department, could induce apoptosis in cancer cells. During her time at TSU, she worked with the Engineering and Biology Departments, the Center for Research in Science and Technology (CREST), and the Urban Academic Village (UAV). She also served as a student ambassador for the College of Science, Engineering and Technology. Ms. Scranton currently works in the Engineering Department.

She began working with the Engineering Department when she commenced her studies in 2008. Since then, she has been working closely with the department chair and staff to ensure the smooth running of the department. She has also been responsible for coordinating department activities and summer programs. When asked to describe her favorite part of working for the department, she stated that being able to mentor high school students during the pre-college engineering program is something that she looks forward to all year. Not only does she coordinate the workshops and activities for the program, she has also taken part as a presenter to introduce the students to concepts in science that they may not have heard about. This summer she introduced the participants to the discipline of biomimicry. This is the method of using inspiration from nature to solve problems in engineering. She is proud to play a part in encouraging the next generation to aspire to overcome their obstacles and pursue rewarding careers in engineering.

Alumni Raves Juan Morrison

Mr. Juan P. Morrison is a native Houstonian and proud Alumnus who now resides in our nation's capital, Washington D.C. He is a two time graduate of Texas Southern University (TSU) and credits his success to the Federal Government for the education and training he received at TSU. Juan received his Bachelor of Science degree in Airway Science Management and his Master of Science degree in Transportation Planning and Management.

Juan Morrison works for the U.S. Department of Transportation in their Federal Transit Administration (FTA) agency. He is a Transportation Program Analyst in FTA's Office of Transit Safety and Oversight were he manages State Safety Oversight programs and travels the nation conducting audits and safety reviews on local transit agencies, ensuring that our traveling public will have safe and secure systems to ride. He attributes his career opportunity to the great tutelage of Dr. Lei Yu and Dr. Carol Lewis in TSU's Transportation Studies Department. He says that the Center for Transportation Training and Research exposed him to various modes of transit and equipped him well for his current career. He will be forever grateful for being awarded the American Public Transportation Association (APTA), and the Dwight D. Eisenhower fellowships through Texas Southern University.

Mr. Morrison says that his time at Texas Southern were some of the best years of his life. He was a member of the Ocean of Soul Marching Band where he was also a member of Kappa Kappa Psi National Honorary Band Fraternity. He is also an active grad chapter member of the Alpha Phi Alpha Fraternity Inc. He says if he could give any advice to current Texas Southern students it would be "Your success is not hard, in fact it is rather simple if you do what's right, the right way, and keep the right attitude."

Juan Morrison says that any alumnus of Texas Southern is automatically an ambassador for the university. He says it is his normal practice to constantly promote the many positive attributes of our great institution. He charges the alumni to join local affiliates, give back, come back, and always be the Tiger you want the world to see.

Student Accomplishments

SETAC Travel Awards

Matthew Fiala, a student of the Environmental Toxicology Ph.D. program, received the Society of Environmental Toxicology and Chemistry (SETAC) travel award (free registration and $400) that makes it possible for him to attend the SETAC North America Annual Meeting in Salt Lake City in November. As a student member, he is in a network of over 6,000 individuals from academia, business, and government. He and his mentor (Dr. Hyun-Min Hwang) will deliver an oral presentation regarding sources, fate, and transport of trace metals in urban stormwater runoff. This annual meeting is an excellent opportunity for him to interact with other students and researchers to develop new research ideas for further exploration.

Visiting Student from BJTU

Ms. Xiaofei Sun, a graduate student from Beijing Jiaotong University in China, is visiting TSU College of Science, Engineering and Technology conducting a research project titled "Environmental Impacts of Using Different Advanced Traffic Signal Status Warning Systems" under the supervision of Dr. Yi Qi. The goal of the research is to evaluate the environmental effectiveness of different driver warning systems through driving simulator tests. The DriveSafety DS-600c simulator in the driving simulator lab in the COSET was used for this research. Ms. Sun has great experience working with TSU students and faculty, and their collaboration has led to a research paper submitted to this years' Transportation Board Annual Meeting in Washington DC. It has been a very productive experience and more international collaborations are expected in the future.

FAA Summer Internships

Aviation Science Management seniors Micah Harper and Freddy Fuentes participated in summer internships with the Federal Aviation Administration (FAA) in Washington D.C. at FAA headquarters. Micah was assigned to the FAA's office of Flight Safety with former TSU Aviation Science Management student Anthony Fathabadi who participated in the summer internship program during the summer of 2014 and who is now a permanent employee of the FAA in Washington. Freddy was assigned to the FAA's Part 121 office that oversees commercial air carriers. Mr. Harper graduated in May 2015 and Mr. Fuentes will graduate in December 2015.

Onyekachi (Kachi) Nwaokolo participated in a summer internship at Paine Field, Snohomish County Airport, in Everett, Washington. Kachi gained valuable experience in airport management and operations, the airport manager Mr. Arif Ghouse stated "Kachi did extremely well – I'm proud of him." The Executive Director for the County was present and was suitably impressed with Kachi' s presentation.

Hobby Fest 2015

Five Aviation Science students participated in the Allen T. Johnson Memorial Scholarship competition at 2015 Hobby Fest. Students from Texas Southern University Aviation Science Program, Embry Riddle, San Jacinto College, Sterling High School, and Carnegie Prep Charter School were invited to participate. Five TSU students were awarded $1,000.00 scholarships, they were: Micah Harper, Delecia Holmes, Jesse Soto, Lydia Ndagire, and Onyekachi (Kachi) Nwaokolo.

COSET 101 DATES

SEPTEMBER 30, 2015
OCTOBER 21, 2015
NOVEMBER 18, 2015
VENUE: SB158
TIME: 12:00 - 1:00 PM

Scholarly and Creative Activities

Publications

Li, M., G. Song, Y. Cheng and L. Yu. Identification of Prior Factors Influencing the Mode Choice of Short Distance Travel. Discrete Dynamics in Nature and Society, vol. 2015, Article ID 795176, 9 pages, 2015.

Olowokere D, Ajofoyinbo A (2015). Energy-efficient MAC Protocol using Directional Antennas in IEEE 802.11– Based Wireless Sensor Networks. International Journal of Electronics Communication and Computer Engineering, Volume 6, Issue 5, September 2015.

Qing Li, Fengxiang Qiao, Lei Yu. (2015). Will Vehicle and Roadside Communications Reduce Emitted Air Pollution? International Journal of Science and Technology. Volume 5, No.1. January 2015. ISSN 2224-3577.

Qing Li, Fengxiang Qiao, Lei Yu. (2015). Socio-demographic impacts on lane-changing response time and distance in work zone with drivers' smart advisory system, Journal of Traffic and Transportation Engineering (English Edition) (2015), doi: 10.1016/j.jtte. 2015.08.003. Elsevier Publishing.

Williams J. L; Hai D.D; Positive Radial Solutions for a Class of Singular p-Laplacian Systems in a Ball. Mediterr. J. Math., 12 (2015), no. 3, 791-801.

Books

Marian Hillar, and Christopher A. Hoffman, translators: "Regarding the Mystery of the Trinity and the Teaching of the Ancients to Philip Melanchthon and His Colleagues"by Michael Servetus.

Translated from Christianismi restitutio by Marian Hillar and Christopher A.Hoffman (Lewiston, NY; Queenston, Ont., Canada; Lampeter, Wales, UK: The Edwin Mellen Press, 2015).

Invited Talks

Williams J. L Positive Radial Solutions for a class of Quasilinear Boundary Value Problems in a Ball, Prairie View A & M University April 24, 2015.

Williams J. L Positive Radial Solutions for a class of Quasilinear Boundary Value Problems in a Ball at the University of Houston April 17, 2015.

Hillar M. "Human Difference," Ian Ramsey Center for Science and Religion, St. Anne's College, University of Oxford, Oxford, Great Britain, July 22-25, 2015.

Marian Hillar, "What Does Modern Science Say about the origin of Human Moral Behavior? Science Confirms Philosophy." 27th International Conference of Philosophy, Athens-Vouliagmeni, 10-16 July, 2015

Dr. Olowokere Presented Keynote address at Satellite 2015

Dr. David Olowokere, Chair of TSU Department of Engineering was keynote speaker at a recently concluded International Conference and Exhibition on Satellite Technology held in Houston August 17 – 19 2015. His speech focused on the trend of development and emergence of man-made satellite systems from inception until now; and its potential of being an integral part of everyday life. He drew from profuse examples of various types of satellites especially weather, communication and navigation, and the NASA launching of a synchronous communication satellite system, explaining the associated engineering issues. He indicated that the launch of Sputnik I in October 1957 by the Soviet Union led directly to many new developments in scientific and engineering fields, including NASA and foundations of The Space Act. "The satellite has now become an increasingly vital and heavily relied-on technology in our society today. They provide direct communication over large distances anywhere around the world. Satellites can deliver bandwidth speeds up to 155 megabits per second. With this, technology companies can use high bandwidth applications such as streaming data or video and web casting. As there are no cables between links, information can be shared with the most remote, hard to reach areas of the world." Dr. Olowokere's speech received a standing ovation from participants, and he has since been invited to participate in the Satellite 2016 conference in Amsterdam.

AWMA Annual Meeting

Dr. Fengxiang Qiao and his Ph.D. student, Qing Li in Environmental Toxicology presented four research papers in the 108th Annual Conference & Exhibition (ACE) of Air and Waste Management Association (A&WMA) in Raleigh, North Carolina from June 22-25. Co-authored with Dr. Lei Yu and other two graduate students Boya You and Wu Ying, these presentations were all related to vehicle emission modeling and traffic noise analyses. The presented papers have been accepted for publication is the conference proceedings. This is one of the oldest and largest conferences on air and waste management.

Dr. Fengxiang Qiao was Re-elected as the First Vice President of ICTPA

May 14-17, 2015, Dr. Fengxiang Qiao and four graduate students Peijia Tang, Qing Li, Boya You, and Wu Ying from Innovative Transportation Research Institute (ITRI) at TSU attended the 28th International Chinese Transportation Professional Association (ICTPA) in Irvin, CA. Dr. Fengxiang Qiao was re-elected as the first vice president of ICTPA. The TSU team conducted a total of six research presentations covering traffic simulation, eco-driving, vehicle emission modeling, connected vehicle technology, etc.