ASTI Honored with Innovation Award

It’s no surprise that Dr. Gary Doll and Akron Service Technologies Inc. (ASTI) are making news. ASTI, the collaboration formed in 2012 between UA and the Timken Co., developed engineered surface solutions utilizing a unique nanocomposite coating system to solve complex problems associated with friction, wear, and corrosion so products perform better, are less vulnerable to environmental conditions, or expend less energy.

The coatings, which consist of nanometer-sized ceramic particles in a matrix of polymers, work so well on roller bearings that Dr. Doll, who now is ASTI’s chief technology officer, said he has heard the technology described as “the single biggest improvement since when they started making bearings out of steel.” ASTI aims to sell the nanocomposite coatings into other industries, including automotive, aerospace, oil and gas, and wind energy.

It was this advancement that earned them a 2013 NorTech Innovation Award. Sponsored by NorTech and Crain’s Cleveland Business, the NorTech Innovation Awards honor the region’s most innovative organizations that have either demonstrated dramatic impact.

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We would like to extend a warm welcome to our new faculty member, Dr. Junliang “Julian” Tao. Dr. Tao comes to us from Case Western Reserve University, where he was a research assistant in the Department of Civil Engineering. He has already made contributions to research in the area of bridge scour, including the following:

- He helped to develop a numerical simulation framework to model the bridge scour process, integrating advanced CFD techniques and novel sediment transport model. This advanced model is unique in that it incorporates the influence of turbulence—which plays a crucial role in the process of scouring but is a factor that has been overlooked for a number of years. This model has been used to study the flow of scour patterns around bridge piers with different geometry.

- He was involved in the design of a bio-inspired sensor to characterize the turbulence at the interface of sediment and river flow. The sensor, which mimics the function and structure of hair cells in fish, employs a piezoelectric microfiber to construct the artificial hair cell and incorporates a unique pattern of electrodes that enables the sensor to have linear sensitivity as well as the directional sensitivity.

- He helped to design a field monitoring system that has been deployed in the field to remotely monitor the evolution of scour depth around real bridge piers. This system uses an innovative sensor based on the time domain reflectometry (TDR) technique and includes a field data...
Dr. Tao enjoys playing basketball and tennis. He loves all kinds of music from classics to rock and roll, he enjoys collecting record cover art, and he occasionally plays the guitar.

We are pleased to have Dr. Tao join the department and we look forward to his arrival.

Dr. Tao also serves as a young member in the Geotechnics of Soil Erosion Committee of ASCE, the Bridge Management Committee of the Transportation Research Board (TRB), and the Committee on Subsurface Soil Structure Interaction of TRB.

Dr. Tao will arrive on campus later this summer. This fall he will be teaching a statics course while continuing his current research on bridge scour. He plans to pursue future research in the area of sustainability, particularly on the topics of energy infrastructure, smart infrastructure, and sustainable materials.

When he isn’t busy teaching and doing research, Dr. Tao enjoys playing basketball and tennis. He loves all kinds of music from classics to rock and roll, he enjoys collecting record cover art, and he occasionally plays the guitar.

Figure 1. Bio-inspired Sensing

Figure 2. Field Monitoring and CFD Modeling of Bridge Scour

We are pleased to announce that Dr. Gunjin Yun recently received tenure and promotion to Associate Professor. Dr. Yun teaches both undergraduate and graduate level courses. His research interests include structural health monitoring, computational intelligence in structural engineering and mechanics, multi-site hybrid simulation technique for collaborative testing, material constitutive model for reinforced concrete structures, and inverse analysis for biomedical imaging. Dr. Yun came to UA in 2008 from Washington University in St. Louis. He is a member of ASCE and Network Earthquake Engineering Simulation (NEES) Consortium, Inc.
Student Teams Take 2nd at Regionals

Once again the UA Civil Engineering student design teams shone at the Ohio Valley Student Conference where they placed second overall among over fourteen universities from Ohio, Pennsylvania, and Kentucky. The students competed in AutoCAD, Balsa Wood, Concrete Canoe, Concrete Horseshoe, Environmental, Technical Paper, and Steel Bridge. As always, we are proud of all of our student teams’ accomplishments and how well they represent the Department of Civil Engineering and The University of Akron.

Concrete Canoe

Placing first in technical report and Men’s Endurance and Co-ed Sprint races and second for presentation, the team just missed a bid to the national competition with their second place overall finish. This year’s theme was *Fishing and the Great Outdoors* and the boat was called *fishful thinkin’*. The team used an old steel bridge creatively fabricated to look like a boat trailer for the stands and they modeled the display table to look like an old fishing store. Although the team did not qualify for nationals, they are proud of all that they accomplished this year and are looking to come back even stronger for next year’s competition.
The Steel Bridge Team qualified for nationals for the fifth year in a row with a second place finish at the Ohio Valley Conference. This year’s bridge was the lightest the team has ever built, weighing only 101 pounds! Unfortunately, the team ran into some violations at the regional competition, which dramatically affected the score. These issues were addressed before heading to the national competition. Fourteen students traveled to the University of Washington in Seattle to participate in the national competition on May 31st and June 1st. Here the team competed in six categories: construction speed, lightness, display, stiffness, economy, and efficiency. While the team did not garner a top three overall finish, they did finish strong in several categories. They took second place in both Stiffness and Efficiency, 12th place for Display, 14th for Lightness and 15th Overall. The team specifically designed the bridge for stiffness and light weight and were pleased to place so well in those categories.

For more information or to get involved as a sponsor or volunteer, send email to: nssbc14@uakron.edu or go to http://www.uakron.edu/engineering/beyond-the-classroom/student-design-teams/steel-bridge-competition.dot.
The annual CFCE Breakfast was held on Thursday, May 2nd at the Martin Center on the UA campus. This year, thirty scholarships totaling $86,400 were awarded. ASCE officers, Connie Hollo, president, Austin Feucht, Captain, Concrete Canoe, and Ben Thoburn, Captain Steel Bridge, presented the latest news from ASCE. Erin Spahr, in charge of 2014 Steel Bridge Nationals, presented plans for the national competition UA will host next year. Two alumni and past scholarship recipients, Suzie (Stelkic) Rufener and Ellen (Baumann) Selle spoke about the importance of receiving scholarships while UA students and what they are doing now in the working world. Additionally, the breakfast was an excellent opportunity for students to network with many local civil engineering leaders.
It’s time to cast your ballot for ASCE President-Elect. UA alum and former Akron resident Robert Stevens is one of two nominees. Stevens was born in Akron, he actually lived in a home that sat where Jackson Field now stands, and attended Spicer Elementary and Central High Schools before attending UA. As a UA student, he co-oped for the City of Akron in the Water, Highway and Planning Departments and joined ASCE as a Student Member. He has been active in ASCE for 50 years.

After graduating from UA with a BSCE in 1963, Stevens continued his education, earning his master’s from Yale in City Planning and Traffic Engineering and later his MSCE and PhD from the University of Michigan. He spent three years as the Technical Director of AMATS and most recently served as Executive VP for ARCADIS U.S., Inc. While Stevens is now retired from full-time employment with ARCADIS, he continues to work with them on a part-time basis doing special assignments. He lives in Keller, Texas with his wife of 47 years, Bonnie. He was a Technical Region Director on the ASCE Board of Direction for three years ending in October 2012. He now is the Chair of ASCE’s Committee on Technical Advancement. Stevens is excited about the possibility of being ASCE’s next President-elect and is committed to being a full-time Presidential officer.

If you are a member of ASCE, you can vote and help determine who will be the next President-Elect. Information on both candidates, including each candidates’ vision statement, can be found at [http://www.asce.org/Official-Nominees-for-President-Elect/](http://www.asce.org/Official-Nominees-for-President-Elect/). Voting is open to ASCE members from June 14 to August 14, 2013.
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in a specific industry or market sector or have the clear potential to do so in the near future.

“Our honorees are developing and commercializing exciting innovations that are helping to revitalize Northeast Ohio’s economy,” NorTech President and CEO Rebecca O. Bagley said. “These inspiring technologies are all vastly unique. What they have in common is the potential to transform our region by creating jobs, attracting capital and generating long-term, positive economic impact.”

ASTI also was honored for its distinctive business model, an open innovation concept that resulted in the formation of the Timken Engineered Surfaces Laboratories (TESL) at UA. Launched in October 2012, it is a place designed to speed the path between discovery and commercialization with students, faculty and industry partnered in the process.

Timken and UA’s College of Engineering contributed to the financing of the labs and the equipment housed in the labs, where students and faculty will work alongside industry experts in surface engineering. TESL is led by Dr. Doll, professor and Timken Endowed Chair in Engineered Surfaces and former Timken researcher who led the team that developed the coating technology. Dr. Doll said ASTI likely will be tapped to commercialize many of the technologies created within the lab, which is intended to serve as a vehicle for students, faculty members and industry researchers to solve surface engineering problems.

Visit http://www.youtube.com/embed/UGCNvR4ciq8?rel=0 for NorTech’s video interview with Dr. Gary Doll.