



TEXAS TECH UNIVERSITY

Department of Mechanical Engineering™

Fall 2012

Texas Tech University - Edward E. Whitacre Jr. College of Engineering

# The Blueprint Newsletter

## Message from the Chair

Dear friends, colleagues, and alumni:

We are pleased to share some of the exciting news in the Department of Mechanical Engineering at Texas Tech University over the past year.

Our undergraduate student enrollment has increased to 1081 students from 950 students last year, and we currently have 39 Master of Science and 73 Doctor of Philosophy students.

The department has also welcomed new faculty members Drs. Jian Sheng, Burak Aksak and Golden Kumar.

Dr. James Yang received the 2012 SAE Ralph R. Teetor Educational Award. Two of our alumni, Rear Admiral (select) John D. Alexander and James E. Lowder were named Distinguished Engineers of the Whitacre College of Engineering.

A group of undergraduate students won the ASME Old Guard Oral Presentation. In addition, both undergraduate and graduate students have received numerous awards and recognitions.

Our graduate program ranking from U.S. News and World Report improved to the 81st position from the 93rd position last year.

The department has built a strong connection with the Academy and Industry Advisory Board (IAB) members. Through this connection, the department has the ability to provide scholarships to our students from the donations of the Academy, IAB, and engineering industry. All that we have accomplished in our education and research programs has been made possible through the excellence and dedication of the ME faculty and staff members.

If you are in the Lubbock area, please do not hesitate to stop by and see the exciting things developing in the department. I would like to thank Greg Ochoa for producing such a wonderful newsletter.



Chaudhuri

Jharna Chaudhuri  
Professor and Chair



The Texas Tech Formula SAE Team competed in the Texas Autocross Weekend that was hosted by the University of Texas at Arlington in July. (Read more on page 3.)

## Sheng Named Whitacre Endowed Chair in Mechanical Engineering

Dr. Jian Sheng has been named the inaugural Whitacre Endowed Chair in Mechanical Engineering at Texas Tech University.

Sheng received a Doctor of Philosophy from The Johns Hopkins University in 2007. Since 2008, he has been on the faculty at the University of Minnesota and at the University of Kentucky.



Sheng

His research is focused on advancing the latest experimental techniques, including 3-D holographic PIV, tomographic PIV, digital holographic microscopy, 3-D fluorescent light field microscopy and the use of a volumetric flow accelerometer.

The primary objective of his research is to establish the capabilities in obtaining high resolution 3-D and multiple component measurements. The research also emphasizes applying these new techniques to advance the understanding of flow wall interactions with engineering and biomedical implications.

He has received funding from the National Institutes of Health, the National Science Foundation, GRI, as well as several state agencies. He is the recipient of a 2008 NSF CAREER award and the 2011-2012 Outstanding Professor Award from the University of Minnesota.

In the past few years, he has authored and co-authored 29 journal and conference papers, gaining more than 400 citations in authored works. His research on micro-organism locomotion and biophysical interactions under dynamical conditions is published in Proceedings of Academy of Science and Annual Review of Fluid Mechanics. Several projects developed in his lab have also received wide media coverage.

# Student News

## ASME Students Place in Old Guard Competition



(L-R) Chase Dorsey, Pejmon Arbrapour, Joseph Campos, Kyle Ellis, and Lauren Clary at the District E Conference.

Pejmon Arbrapour, a senior mechanical engineering major, won first place in the Old Guard Oral Presentation at the American Society of Mechanical Engineers Student Professional Development District E Conference. The presentation was “Reinventing the Wheel: A Radially Collapsing Wheel for an innovative Wheelchair Design.”

Kyle Ellis, a senior mechanical engineering major, won second place on the same topic in the Old Guard Poster Competition at the same conference.

Arbrapour and Ellis will compete at the national conference in November with their presentation and poster. Group members Lauren Clary, Joseph Campos, Pejmon Arbrapour, Kyle Ellis and Chase Dorsey worked on the design in their engineering design course.

## Texas Tech Formula SAE Team Competes in Texas Autocross Weekend



Formula SAE

The Texas Tech Formula SAE Team competed in the Texas Autocross Weekend that was hosted by the University of Texas at Arlington in July. Formula SAE is a student design competition organized by SAE International.

This year, the car scored 153 more points than last year and was able to reduce the vehicle’s weight by 107 pounds.

The team was sponsored by 25 organizations, including Bell Helicopter, Schlumberger, Fluor, Cameron, NuTech Energy, and SolidWorks.

SAE was also supported by local Lubbock businesses Teinert Metals, McWhorter Tire, TES Performance, Texas Tool, Richardson Collision, TexCraft.

## ASME Student Chapter Works to Improve Community, Networking, and Impact

The Texas Tech ASME Student Chapter, working to achieve goals for the 2011-2012 academic year, provided opportunities for members to make a difference in their community, further their interests in the field and industry of mechanical engineering, and to socialize with their professors and peers.

Before the semester began, the officers and students volunteered at the ASME IPTI Pistol Shoot, where students were able to network and gain valuable insight from veterans of the engineering industry. ASME also hosted a design competition. Eight teams crafted cardboard canoes and raced in an on-campus pool for scholarship prizes.

The chapter worked in the Lubbock community through an Arbor Day event and was a key contributor to the South Plains Math and Science Competition. This event, for potential engineering students in middle and high school, was organized by the university’s T-STEM Center.

Membership in the chapter grew this year, increasing from 187 to 263 student members. This growth drew

the attention of the national organization, and the Texas Tech chapter was recognized as the fourth largest student section in the nation, the eighth largest student section in the world, and fastest growing student section out of 526.

In the 2012-2013 academic year, the Texas Tech ASME Student Chapter will continue to work to bridge the gap between students and the engineering industry, with hopes of giving its members a greater chance of success and employment in their chosen fields of work.



ASME Student Chapter Activities



## ME Student Receives NATAS Award

The North American Thermal Analysis Society (NATAS), a group that is dedicated to promoting the understanding and advancement of thermal analysis, has awarded Keerti Kappagantula, a doctoral student in the Department of Mechanical Engineering a NATAS Student Award.



Kappagantula

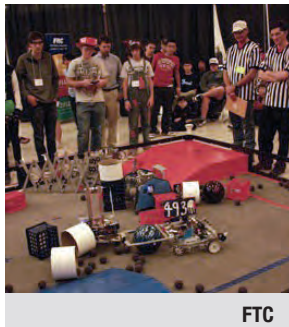
The award recognizes the best original contribution by a graduate student to the advancement of the field of thermal analysis and is open to any student in a masters or doctoral program at a university in North America.

North American Thermal Analysis Society (NATAS) is one the most renowned, internationally acclaimed body in the field of thermal analysis.

Every year, NATAS conducts annual conferences and researchers from world over congregate at these annual conferences to discuss the latest advancements in thermal engineering and thermal analysis.

## Texas Tech Hosts FTC Regional Robotics Championship

Teams of 9th-12th graders from the western half of Texas participated in the FIRST@Tech Challenge (FTC) Panhandle-Plains Regional Championship Tournament on March 3 for an opportunity to win statewide recognition for design excellence, sportsmanship and teamwork and to advance to the National Championship in St. Louis.



FTC

Dr. Alan Barhorst, a professor of mechanical engineering, hosted the event.

FTC is a challenging mid-level robotics competition designed for high school students who want a hands-on learning experience to develop and hone their skills and abilities in science, technology, engineering, and math.

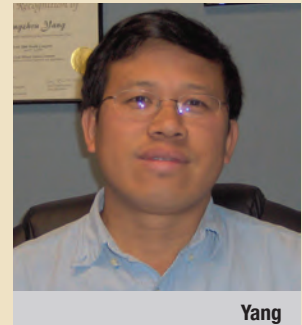
Teams of up to 10 students are responsible for designing, building, and programming their robots to compete in an alliance format against other teams. The robot kit is reusable from year-to-year and is programmed using a variety of languages.

Teams, including coaches, mentors, and volunteers, are required to develop strategy and build robots based on sound engineering principles.

## Faculty News

### Yang Receives Teetor Educational Award from SAE

Dr. James Yang, an assistant professor of mechanical engineering, has been named a recipient of the 2012 SAE Ralph R. Teetor Educational Award from SAE International. The award is in recognition of his outstanding contributions to SAE's engineering education initiatives.

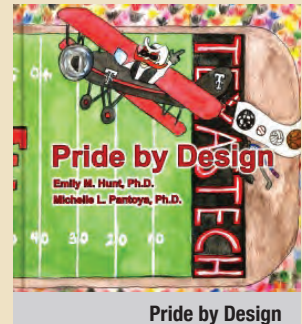


Yang

Reflecting the firm belief of its donor, Ralph E. Teetor, that young engineering educators are the most effective link between engineering students and their future careers, the SAE Ralph R. Teetor Educational Fund's major program is focused on younger engineering educators. Its objective is to provide an engineering atmosphere that these educators can meet and exchange views with practicing engineers.

### Pantoya and Hunt Publish Second Children's Book

Dr. Michelle Pantoya, a professor of mechanical engineering, and Dr. Emily Hunt, a professor at West Texas A&M University, have published their second children's book. "Pride by Design" features Raider Red and Raiderland and aims to stimulate young interest in engineering by portraying how sports and engineering go hand in hand.

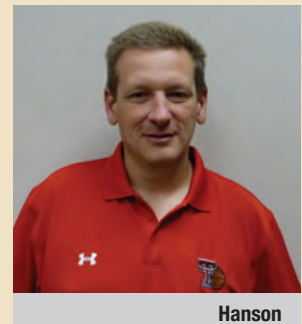


Pride by Design

The book can be purchased online for \$15.00 at [merchandise.ttu.edu](http://merchandise.ttu.edu)

### Hanson Named Distinguished Professor by Tau Beta Pi

Dr. Jeff Hanson, an instructor of mechanical engineering and Texas Tech alumnus, has received the 2012 Distinguished Professor Award from the Texas Tech chapter of Tau Beta Pi.



Hanson

Tau Beta Pi seeks to honor professors that excel inside and outside the classroom. Hanson was selected because of his work to innovate the current mechanical engineering curriculum as well as his desire to help students engage in discussion of real world topics that better prepare them for the engineering industry. He was also commended for his passion for engineering integrity.



TEXAS TECH UNIVERSITY

## Department of Mechanical Engineering™

### The Blueprint

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## New Faculty

### Dr. Burak Aksak



Dr. Burak Aksak joined the department in January 2012 as an assistant professor. He received a Ph.D. in mechanical engineering from Carnegie Mellon University (CMU) in 2008. After completing his postdoctoral studies in 2009 at CMU, he went on to cofound nanoGriptech LLC, a start-up company dedicated to developing and commercializing bio-inspired fibrillar adhesives. nanoGriptech LLC was awarded over \$1 million in research grants from the NSF, DoD, and Pennsylvania Nanomaterials Commercialization Center.

At Texas Tech, Aksak's lab focuses on developing bio-inspired devices for adhesion, sensing, actuation, and energy harvesting. His primary focus is to build multi-functional, self-sufficient systems that exploit the increased surface-to-volume ratio and the high sensitivity of micro/nano structures.

### Dr. Golden Kumar



Dr. Golden Kumar joined the department in January 2012 as an assistant professor. He received a Ph.D. in physics from Technical University Dresden in 2005 and a master of science in materials science and engineering from IIT Kharagpur, in 2000. He spent two years as a postdoctoral associate at the National Institute of Materials Science in Tsukuba, Japan. Before coming to Texas Tech, he was an associate research scientist at Yale University, where he developed viscous flow-based molding of amorphous metals for applications in catalysts, MEMS, and nano-imprinting.

Kumar's research activities at Texas Tech involve fabrication of functional metallic materials with tunable properties such as wetting, adhesion, reactivity, strength, and plasticity.

### Dr. Guillermo Araya



Dr. Guillermo Araya has joined the department in September 2011 as a research assistant professor. After completing a Ph.D. in aeronautical engineering from Rensselaer Polytechnic Institute in August 2008, he joined the Department of Mechanical Engineering at Johns Hopkins University as a postdoctoral fellow under the supervision of Dr. Charles Meneveau. He was a research assistant at Swansea University from 2009 to 2011.

His research interests include computational fluid dynamics of turbulent incompressible and compressible flows, wind energy array modeling, DNS, LES, RANS, URANS, turbulence modeling, heat transfer and flow control. He has authored and co-authored 30 journal papers and refereed conference papers.

## Keeping in Touch

The Texas Tech Department of Mechanical Engineering would like to know what is happening in your professional life. Visit the following website to update your information or let us know about your accomplishments: [www.coe.ttu.edu/info](http://www.coe.ttu.edu/info)

If you are interested in being a member of the ME Academy, please contact our chair, Dr. Jharna Chaudhuri at [jharna.chaudhuri@ttu.edu](mailto:jharna.chaudhuri@ttu.edu)