Prism: Western Michigan University’s Newsletter for Academic Affairs

Dr. Mitchel Keil, a professor in the Department of Industrial and Manufacturing Engineering (IME), is leading a project to understand the causes of heavy-truck rollovers. The project is sponsored jointly by the National Transportation Research Center, Inc. (NTRC), in Knoxville, Tenn., and WMU’s Center for Advanced Vehicle Design and Simulations (CAViDS). Several CEAS faculty and students borrowed one of the largest engineering “toys” ever used for a research project – a 48-foot tanker trailer. With Keil as their adviser, Sean Duncan, Taylor Krugh, Madeline McAuley, and Todd Simcina, all seniors enrolled in IME technology programs, used reverse engineering on the tanker truck to recreate all the geometry of a heavy tractor and tanker trailer in order to develop a full-scale simulation model with Pro/ENGINEER. TRITOP photogrammetry, which is a process of deriving geometric properties from photographic imagery, and ATOS 3-D digitizer systems were used to complete the project. The team explained the process used and the results of their six-month study in a senior design project titled “Modeling a Heavy Truck for Rollover Stability,” which was presented in April. “We built a full-scale 3-D model of a heavy truck for rollover simulation and testing,” said Duncan. Their model allows for testing of tractor and trailer together or as separate components. In addition, the model allows researchers to examine specific parts of each component. The primary benefit of the research will be to save lives because 52 percent of all truck driver fatalities are the result of rollovers. The model will also save time and cost. Others who assisted in the project include Dr. Richard Hathaway, Dr. Betsy Aller, Dr. Kapseong Ro, Dr. Upul Attanayake, and Dr. Paul Engelmann. The model was developed for CAViDS for further simulation analysis of rollovers.

Faculty Accolades

Three professors and a doctoral candidate from the Department of Industrial and Manufacturing Engineering (IME) were featured in the May 2009 issue of Modern Casting for the presentation of their paper at the 113th Metalcasting Congress held in Las Vegas in April. Dr. Steven Butt, Dr. Tycho Fredericks, Dr. Sam Ramrattan, and Supretta Amin-Kumar attended the conference for the presentation of their paper “Safety and Ergonomics Revisited: How Has the Industry Changed in 10 years?” The paper reviews the results of a comparison of information on safety programs that the researchers collected in a recent survey of metalcasters with information on safety programs from 1997. In the Modern Casting article titled “The Best of the Best,” Senior Editor Shea Gibbs describes the IME colleagues’ selection as one of the top three selected by conference attendees. The article provides a summarized description of the contents of the presentation.

Drs. Ala Al-Fuqaha and Dionysios Kountanis, Department of Computer Science (CS) professors who direct the CS Telecommunications Research Lab (TRL), are exploring various facets of smart technology to improve automotive safety and business computing. They were recently awarded a two-year grant from the Michigan Department of Transportation (MDOT) to pursue a research and development effort that aims to increase the safety and efficiency of transportation networks. The project includes working closely with MDOT, the University of Michigan, the University of Arizona, HNTB Inc., and Motorola to develop test facilities that evolve state-of-the-art vehicle infrastructure integration (VII) technologies and concepts and also work to grow the overall national and international VII programs. Five WMU student vehicles will be outfitted with MOTO-MESH, a Motorola network from that enables communication between cars. Vehicles will be equipped with sensors so data can be collected from the vehicles through their CANbus systems. “The end result of this is that we will be avoiding accidents and saving lives,” Al-Fuqaha said. Also, Al-Fuqaha and continued on next page