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Sudesh Woodiga

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Delivering fuel efficiency and reduced emissions key for Ford engineer

By Linda Hanes

Holder of three degrees from Western Michigan University—bachelor’s, master’s, and doctorate—alumnus Sudesh Woodiga has achieved much success as an aerodynamics engineer at the Ford Motor Company in Dearborn, Mich.

Woodiga enrolled at WMU in fall 2002 after completing the first two years toward a WMU bachelor’s degree in Malaysia through the University’s twinning program at Sunway University. Founded in 1987, the 2 + 2 program between the two schools helped Malaysia emerge as a Southeast Asia regional center for education.

He stayed in Kalamazoo to earn his graduate degrees and was quickly hired by the Ford Motor Company after completing his Ph.D. in 2013. His current role is twofold: development of tools and methods to support the company’s aerodynamics team; and, the aerodynamics development of vehicle programs.

The main focus of aerodynamics development is delivering improved fuel economy and reduced greenhouse gas emissions, which is achieved by optimizing the exterior shape of a vehicle to reduce aerodynamic drag. Two major vehicle programs Woodiga has supported at Ford to this end are the 2015 F-150 truck and the Mustang car.

Woodiga’s doctoral research was in the area of fluid mechanics and aerodynamics measurements. With his faculty mentor, Dr. Tianshu Liu, a WMU professor of Mechanical and Aerospace Engineering from China, they developed an industry first: the Global Luminescent Oil Film Skin Friction Tool. The tool has received recognition from academic institutions and government agencies both within the United States and internationally for its contributions to the fluid mechanics and aerodynamics community.

Skin friction is a metric in fluid mechanics and aerodynamics that describes the interaction between a fluid and the medium with which it interacts. The characterization of this interaction—skin friction measurements—enables the fundamental understanding of flow in the respective systems, which in turn can be used as a design aid in flow control applications to improve the efficiency of these systems.

While at WMU, Woodiga led the Applied Aerodynamics laboratory from an operational perspective, supporting both research and academic instruction activities. Woodiga attributes that experience as a factor in securing a position within the aerodynamics group at Ford, which he said is engineering for a better, greener tomorrow, with more choices to drive energy efficient, environmentally friendly vehicles.

“I was originally interested in the aspect of engineering that focused on automotive design and aerodynamics,” said Woodiga, a native of Subang Jaya, Malaysia. “I felt that working at Ford Motor Company would be an interesting challenge, especially since energy management and fuel economy are important characteristics of a vehicle, aerodynamics being a critical subset of that. It has been rewarding to apply the knowledge and experience that I gained at WMU to tackle the issues that we are faced with in our world today, specifically improved energy consumption efficiency.”

The Ford Motor Company is multinational and the bedrock of Michigan’s economy. Since its founding in 1903, Ford has been on the cutting edge of engineering and manufacturing within the automobile industry, and its engineers must meet high benchmarks for strategic innovation. Woodiga said his deep interest in developing new and innovative forms of testing in research set him apart during the application process.

“During the course of my doctoral research, I learned how to adapt, use what resources I had available, and to work around roadblocks to achieve my final goal,” he said. “I was able to do a lot of hands on work at WMU that definitely helped me going into the industry because many of the things I learned were directly applicable skills and expertise highly acknowledged and appreciated by the management of my department within Ford Motor Company.”