Final Five

with Hui Yang, industrial engineer and associate professor, Penn State

Hui Yang is a professor, mentor and advisor to students at Pennsylvania State University who are studying industrial engineering. He is also an IE investigator and active member of professional and societal industrial engineer communities. Yang earned the CAREER award for Early Career Development from the National Science Foundation.

What inspired you to pursue a career in industrial engineering?

Data is everywhere in the industry. I am interested at digging into the most useful information from the data and leveraging them for optimal design, management and control of state-of-the-art industrial systems. Connecting theory with industrial practice for broader impact to our society led me to a career in IE.

Your project, sensor-based modeling and control of nonlinear dynamics in complex systems for quality improvements in manufacturing and healthcare, won the CAREER award. What motivated you to tackle this project?

Many industries, including manufacturing and healthcare, have identified the urgent need to harness and exploit nonlinear dynamics – arising whenever multifarious entities of a system cooperate, compete or interfere – to introduce creative new products or services with remarkable features, such as adaptation, customization, responsiveness and quality on an unprecedented scale.

How does industrial engineering apply to other aspects of your life besides teaching?

As an IE we are customized to optimize systems of interests and achieve maximal efficiency. This is not just in teaching but also in daily life. I am used to the optimization of time management in daily life, and I have developed a habit to make things efficient – for example, the space in the refrigerator, the garage or the path taken in travel.

How do your students affect your industrial engineering research?

Students are big contributors to the research. We have fun working together to brainstorm new ideas, investigate new problems, develop new methods and tools and disseminate the significant results. They learned in the process and have grown in the process. I have also learned to become a better mentor, guiding them in the process of scientific discovery. I am devoted to building the successful development of graduate students and am so excited to witness their growth. Everyone in the group has a unique perspective on the research problem (high school research students, undergraduate students, graduate students, faculty members). We, as a team, work on the development of new ideas and implement them for real-world applications.

What industries do you feel would benefit most from your research and industrial engineering?

As an IE, I have worked on sensor-based modeling and control of manufacturing systems for years. Recently, I worked closely with clinicians and healthcare researchers. I am always excited about research investigations into the most sophisticated machine, the human heart, with my collaborators. I have seen the suffering as patients at the hospital battle heart problems. The human machine is very complex. I work with doctors, physiologists, statisticians and IEs with a long-term aim to tackle this medical problem to improve the health of our society.

– Interview by Ashlyn Kirk

Ashlyn Kirk is the Web managing editor for IISE.