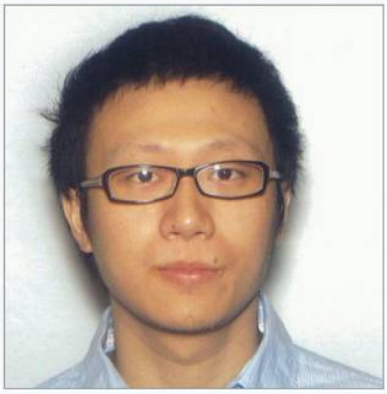
useful information as much as possible. Their proposed models can be applied in general situations where a surgery can have any number of CPT codes and any combination of CPT codes. Using real surgical data, they compared the proposed models with benchmark methods and found remarkable reductions in prediction errors.

CONTACT: Ying Li; yli@mays.tamu.edu; (979) 458-4787; 4217 TAMU, Department of Information and Operations Management, Texas A&M University, College Station, TX 77843



Arizona State University professor Jing Li and Ph.D. student Shuai Huang explored the possibility of using manufacturing data with inevitable sensor measurement errors to do process control.

Process control with inevitable sensor measurement errors

Rapid advances in sensors and distributing sensing technologies have created massive data in modern manufacturing environments. This provides an unprecedented opportunity for process control and quality improvement. On the other hand, as the data is collected by sensors that will inevitably wear out or fail during continuous operation, measurement errors in the data, such as insensitive, biased and noisy readings, can be enormous. As a result, process control decisions made based on the data may be misleading.

A natural question arising from this reality is whether we can still use the data to do process control. The answer is yes. In "Regression-Based Process Monitoring with Consideration of Measurement Errors," professor Jing Li of Arizona State University and her Ph.D. student, Shuai Huang, investigated four major types of measurement errors commonly existing in manufacturing data and developed new control charts for process monitoring and fault detection using the data that contain the measurement errors. Furthermore, they developed a method to identify the maximum allowable measurement error in the data that still allows certain monitoring and detection goals to be realized.

Their work will help the modern manufacturing industry fully explore the potential of advanced sensing technologies in their process control practice, even when the data is of imperfect quality due to inevitable sensor measurement errors. The work will also help manufacturers achieve the best trade-off between quality and cost in selecting sensors to be used in their process. It allows for economical but imperfect sensors to be very useful. This work is applied to a hot forming and a cotton spinning manufacturing process.

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CONTACT: Jing Li; jinglz@asu.edu; (480) 965-0125; assistant professor, industrial engineering, School of Computing, Informatics and Decision Systems Engineering, Arizona State University, Tempe, AZ 85281

Susan Albin is a professor at Rutgers University in the department of industrial and systems engineering. She is editor-in-chief of IIE Transactions *and a fellow of IIE.*