

Industrial & Systems Engineering

Seminar Announcement

Quality improvement: from autos and chips to nano and bio

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Abstract: Quality improvement (QI) has a glorious history, starting from Shewhart's path-breaking work on statistical process control to Deming's high-impact work on quality management. Statistical concepts and tools played a key role in such work. As the applications became more sophisticated, elaborate statistical methods were required to tackle the problems. In the last three decades, QI has seen more use of experimental design and analysis, particularly the methodology of robust parameter design (RPD). I will first review some major ideas in RPD, focusing on its engineering origin and statistical methodology. I will then discuss more recent work that expands the original approach, including the use of feedback control and operating window. To have an effective solution, the subject matter knowledge often needs to be incorporated. Techniques for fusing data with knowledge will be presented. For advanced manufacturing and high-tech applications, there are new challenges and possible paradigm shift posed by three features: large varieties, small volume and high added value. I will speculate on some new directions and technical development. Throughout the talk, the ideas will be illustrated with real examples, ranging from the traditional (autos and chips) to the modern (nano and bio).

Bio: *C. F. Jeff Wu* is Professor and Coca Cola Chair in Engineering Statistics at the School of Industrial and Systems Engineering, Georgia Institute of Technology. He was the first academic statistician elected to the National Academy of Engineering (2004); also a Member (Academician) of Academia Sinica (2000). A Fellow of American Society for Quality, Institute of Mathematical Statistics, of INFORMS, and American Statistical Association. He received the COPSS (Committee of Presidents of Statistical Societies) Presidents' Award in 1987, the COPSS Fisher Lecture Award in 2011, the Deming Lecture Award in 2012, and numerous other awards and honors. He has published more than 165 research articles and supervised 42 Ph.D.'s. He has published two books "Experiments: Planning, Analysis, and Parameter Design Optimization" (with Hamada) and "A Modern Theory of Factorial Designs" (with Mukerjee).

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