ThC02: Business and Bandwidth: A Tutorial on How Business and Use Models Affect Industrial Control Design
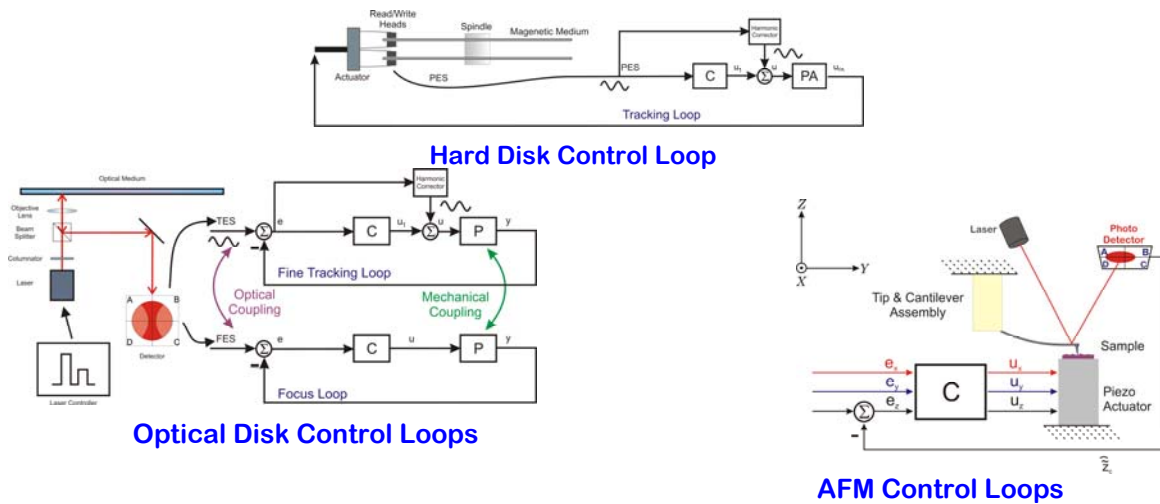
Hard Disk Control Loop

Optical Disk Control Loops

AFM Control Loops

Three different mechatronic control systems with vastly different business and use models.

Students studying control problems often learn a lot of wondrous algorithms that impart near mythical properties to the systems that they are applied to. At least this is how it works in theory and simulation. In practice, however, a thorough understanding of the system, the use model, and the market is often far more important than the differences between any two optimization algorithms. Knowing when and where a particular algorithm is useful is typically at the heart of real control problems.

The session, through a series of four talks by presenters with deep industrial experience, will describe a set of industrial control problems. These problems will provide context for control designs. The participant will come to understand industrial control not as a problem of "how to best optimize algorithm X" but of which of many algorithms can help in a practical way.

Structure of the Tutorial Session

The tutorial session consist of 4 talks:

- **ThC02.1 (60 min):** *A Tale of Three Actuators: How Mechanics, Business Models and Position Sensing Affect Different Mechatronic Servo Problems,* by Dr. Daniel Abramovitch of Agilent Laboratories.   This talk will describe similarities and differences between the servo control problems for optical disk drives, hard disk drives, and atomic force microscopes with a view to how the business and use models affect the control design.

- **ThC02.2 (20 min):** *Listening to the Problem: Comparing and Contrasting Control Engineering Requirements in the Process and Automotive Industries,* by Dr. Greg Stewart of Honeywell Automation & Control Solutions Process Solutions. This talk will describe similarities and differences in real time control as it is applied to the process and automotive industries.

- **ThC02.3 (20 min):** *Feedback to the Future: Controls Implementation in the World of Automotive Constraints,* by Dr. Anthony M. Phillips of Ford Motor Company. This talk will present an overview of the complexities involved with developing control algorithms for automotive applications.

- **ThC02.4 (20 min):** *The Gap between Academic Results and Industrial Use in Chemical Process Control,* by Dr. Scott Boyden of British Petroleum and Professor Karlene Hoo of Texas Tech University. The talk will describe will describe the constraints of the process control industry.