

### **37b Using Visualization in the Process Control Curriculum**

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Hands-on challenges which demonstrate and reinforce abstract process control concepts benefit the learning process. A process control training simulator offers an alluring method for providing students with the significant hands-on practice critical to learning. The proper tool can provide virtual experiences that give students a broad range of focused engineering applications of theory in an efficient, safe and economical fashion. And it can work as an instructional companion as it provides interactive challenges that track along with classroom lectures.

Process control is a subject area well suited to exploit the benefits of a training simulator. Modern control installations are computer based, so a video display is the natural window through which the subject is practiced. With color graphic animation and interactive challenges, a training simulator can offer experiences that literally rival those of the real world. These experiences can be obtained risk free and at minimal cost, enabling students to feel comfortable exploring nonstandard solutions at their desk. If properly designed as a pedagogical tool with case studies organized to present incremental challenges, we believe learning can be enormously enhanced for process control with such a training simulator.

To this end, Control Station was developed as an instructional tool for process dynamics and control. Control Station is a point-and-click environment compatible with Microsoft Windows. The development goal was a simulator that is visually appealing, easy-to use and accepted by students and practitioners. The software is designed so students will:

- learn how to collect and analyze process data to determine the essential dynamic behavior of a process,
- learn what "good" or "best" control performance means for a particular process,
- understand the computational methods behind the different control algorithms and learn when and how to use each one to achieve best performance,
- learn how the different adjustable or tuning parameters required for control algorithm implementation impact control performance and how to determine values for these parameters

Presented will be the Control Station software and how it can benefit learning of both students and industrial practitioners.