

# Platforms for Control System Education and Research

## Challenge

With the rise of technologies like unmanned vehicles and robotics, the importance of understanding feedback control is becoming more and more prevalent. Unfortunately many regard control systems as a very theoretical and abstract course. Having a comprehensive lab component to a control systems course is vital to connecting abstract theory to practical applications. Further, it is important to have well-designed labs to ensure the experience is learning about control systems, and not tinkering with hardware or tedious programming.

## Program

The goal of this session is to introduce Quanser's solutions and approach to Control Systems for teaching and research. Three systems will be demonstrated: the Quanser AERO, Active Suspension, and Coupled Tanks. The Quanser AERO is a multi-configurable aerospace-based system used for control system teaching and research. The Active Suspension is double spring mass damper system with an automotive application. Finally, the Coupled Tanks is a process control system with different configurations geared towards controlling fluid level.

The workshop will also include a hands-on portion where attendees will have the opportunity to learn about classic and modern control techniques, and see examples of how Quanser solutions are used in academic research. The Rotary Servo Base Unit will be used to explore PID-based control, and the Rotary Servo Flexible Link and Rotary Flexible Joint will be used to demonstrate vibration mitigation for robotics type systems that exhibit flexibilities using state-feedback.

## Key take-aways:

- ✓ Hands-on experience with Quanser control systems platforms and software tools
- ✓ Gain insight in what researchers are doing
- ✓ Network with peers

