

MathWorks Special Session at IFAC ACE 2025

Title: Enhancing Controls Teaching with MATLAB and Simulink

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Abstract

Educators often face the challenge of limited time for creating comprehensive curricula while striving to help students grasp complex control concepts and bridging the gap between theory and practice. This session aims to address these issues by introducing teaching and learning resources that educators can utilize to save time and enhance their control classes, while providing a more engaging and interactive learning experience for students. We will highlight ready-to-use control courseware developed by leading universities, virtual labs, educational videos, and self-paced tutorials.

Additionally, in the session we will showcase how to prepare students with industry-relevant skills through hands-on experiments using the low-cost balancing bi-copter hardware. We will demonstrate a workflow including system identification, control design, and deployment to hardware. We will discuss how educators can use such hardware to introduce fundamental control topics such as PID control, as well as more advanced topics like model predictive control.