2025-11-01

E028: Appendix Reference Part 4

DIP-SMC-PSO Educational Series

January 25, 2026

Overview

This episode covers appendix reference part 4 from the DIP-SMC-PSO project.

Part: Appendix
Duration: 15-20 minutes
Source: Comprehensive Presentation Materials

section0   System Architecture Diagram

High-Level Component Interaction:
   [Visual diagram - see PDF]

section0   Control Loop Flow Diagram

Real-Time Control Cycle:
   [Visual diagram - see PDF]
   Cycle Timing:
   - **Time step (dt):** 0.01 s (100 Hz) - **Controller compute:** 0.5-1 ms - **Plant update:**
9-9.5 ms (RK45 integration) - **Total cycle:** 10 ms

section0   Research Paper Figure: Controller Comparison

Example: MT-5 Comprehensive Benchmark Results
   [Visual diagram - see PDF]

section0   TikZ Diagram: Sliding Surface Dynamics

Phase Portrait: State Trajectory to Sliding Surface
   [Visual diagram - see PDF]
   Key Insight: Trajectory converges to sliding surface, then slides to origin

Resources

- **Repository:** `https://github.com/theSadeQ/dip-smc-pso.git`

- **Documentation:** See `docs/` directory

- **Getting Started:** `docs/guides/getting-started.md`

Educational podcast episode generated from comprehensive presentation materials