

Podcast Episode E018

Numba Vectorization: 50x Speedup for Batch Simulations

DIP-SMC-PSO Project

Generated from comprehensive presentation materials

January 23, 2026

Episode Overview

This episode is part of a comprehensive 100+ episode podcast series covering the Double-Inverted Pendulum Sliding Mode Control with PSO Optimization project.

Topic: Numba Vectorization: 50x Speedup for Batch Simulations

Section: 05

Duration: 15-20 minutes (estimated)

Format: Conversational AI-generated audio via Google NotebookLM

Introduction

[TODO: Add detailed content for this episode]

This episode should cover the following key points:

- Overview of the topic
- Technical deep-dive with examples
- Connections to other parts of the project
- Practical insights and lessons learned

Technical Details

[TODO: Extract relevant slides from sections/part1_foundations/05_*.tex]

Key Takeaways

[TODO: Summarize main points]

Next Episode Preview

[TODO: Transition to next episode topic]

Production Notes

NotebookLM Processing:

1. Compile this .tex file to PDF: `pdflatex E018_...`
2. Upload PDF to NotebookLM notebook
3. Click "Generate Audio Overview"
4. Download resulting .mp3 file
5. Rename to: `E018_NumbaVectorization :5 0xspeedupforBatchSimulations.mp3`

Target Audience: Graduate students, control engineers, Python developers

Prerequisites: Basic understanding of control theory and Python

Related Episodes:

- Previous: [Episode ID]
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