

**Data Driven Approaches for Nonlinear System Identification and Control of Hardware
in the Loop Systems**

by

Patrick Neely

A thesis submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Master of Science

Auburn, Alabama
May 10, 2025

Keywords: System Identification, Data Driven Modeling, Machine Learning

Copyright 2025 by Patrick Neely

Approved by

Chad Rose, Chair, Assistant Professor of Mechanical Engineering
Scott Martin, Assistant Professor of Mechanical Engineering
Matthew Kirchner, Assistant Professor of Electrical and Computer Engineering

The Work Contained is CUI
Intentionally Left Blank