

Hardware-in-the-Loop Plant Modeling for Autonomous Vehicle

Progress Presentation

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Outline

- 1 Introduction
- 2 Steering Subsystem
- 3 Acceleration Subsystem
- 4 Brake Subsystem
- 5 Concluding Remarks
- 6 References

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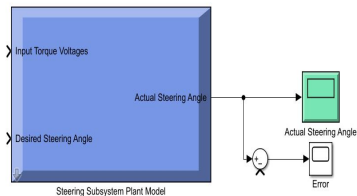
Introduction

- Modeled
 - Steering Subsystem
 - Acceleration Pedal Subsystem
 - Brake Pedal Subsystem
- Not Modeled
 - Shift Subsystem
 - Speed Subsystem
 - Speed Control Subsystem
- Manual Data vs. By-Wire Data
- Neural Network Modeling [?] [?]

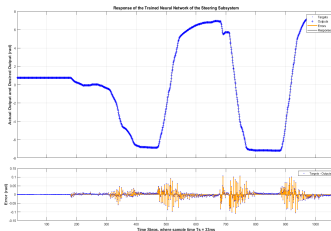
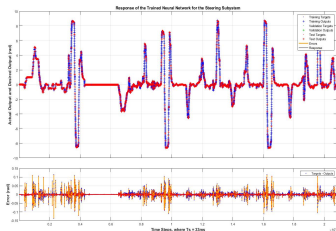
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Steering Subsystem



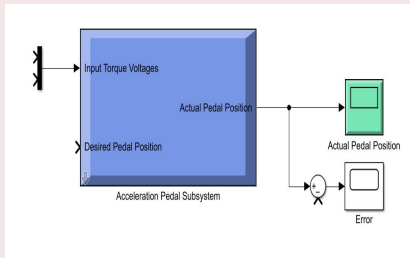
- Only a few samples are just outside of the accuracy requirements
- Transfer function model did not meet the accuracy requirements



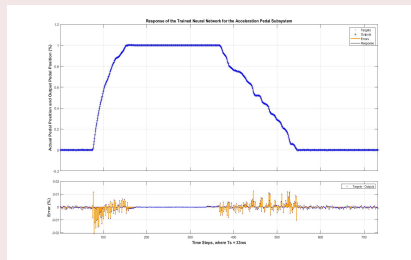
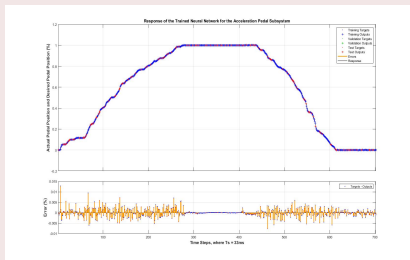
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Acceleration Subsystem



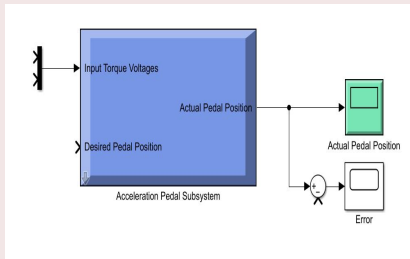
- All samples within 2% of the actual output
- Transfer function model did not have the same accuracy bounds
- Fewer concerns about connections in Simulink



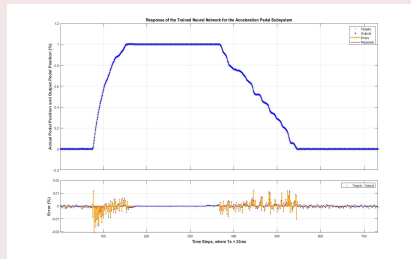
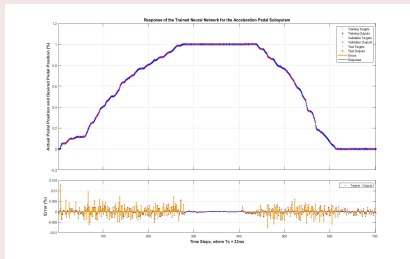
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Brake Subsystem



- All samples within 2% of the actual output
- Transfer function model did not have the same accuracy bounds
- Fewer concerns about connections in Simulink



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Concluding Remarks

Semester goals

- Test our modeled subsystems on the HIL bench
- Collect data for the remaining subsystems
- Model the remaining subsystems and test on the HIL bench
- Create final report highlighting our findings
- Present our findings

Anticipated Challenges

- Having time to model the remaining subsystems
- Needing to correct any models

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