System Verification and Validation Plan for CVT Simulator

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Revision History

Date	Version	Notes
October 11th, 2024	0	First version of VnV plan

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1 Symbols, Abbreviations, and Acronyms

acronym	**definition**
CVT	Continuous Variable Transmission
GPS	Global Positioning System

Table 1: Verification and Validation Acronyms

2 General Information

2.1 Summary

This document will go into detail on the real-world data validation performed for the CVT Simulator. As per Dr. Smith's instructions, it will be completed prior to the course's end. This document currently serves as a placeholder for the final VnV extra report.

3 Functional Tests Evaluation

3.1 Simulation Model

3.1.1 Position

- Car go fast... still! Explained by poor modelling of air resistance and other resistive forces such as rolling resistance, frictions, etc

Car position over time

3.1.2 Velocity

- Car go fast, shocker! Ignored many resistive forces

Car velocity over time

3.1.3 Acceleration

Not availabel (no data gotten from IMU)

3.1.4 Shift

- We see generally a flat shift in both, which is great! - Both also have a low ratio, although slight differences, they definitely both exist well

- Low ratio is somewhat different in calculations (causes: Wrong geometry, precision in machined parts, assumption of slip) - Through the shift, we see some curve. A subtle change in ramps could cause this, or a poor understanding of the springs in our system. Potential in the real CVT system for spring to bind as it compresses, bringing unknown forces - Don't see max shift much, this is due to poor data collection tests - Limits on the length of track we have access to mean we dont see our top end of the speeds our vehicle can acheive.

1 and 2 (What is 1?)