7146CEM: Automotive Software Engineering - Design and Development

Coursework

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Table of Contents

[Introduction 3](#_Toc87468768)

[Software Development Life Cycle 3](#_Toc87468769)

[Requirement Gathering 3](#_Toc87468770)

[PID controller 3](#_Toc87468771)

[Cruise Control 3](#_Toc87468772)

[Motor Speed 3](#_Toc87468773)

[Code 3](#_Toc87468774)

[Design 3](#_Toc87468775)

[PID Controller 3](#_Toc87468776)

[PID Tuning Algorithm 3](#_Toc87468777)

[Cruise Control 3](#_Toc87468778)

[Motor Speed 3](#_Toc87468779)

[Coding 3](#_Toc87468780)

[Testing 3](#_Toc87468781)

[Validation 3](#_Toc87468782)

[Advantages of the used SDLC model 4](#_Toc87468783)

[GitHub Workflow 4](#_Toc87468784)

[References 4](#_Toc87468785)

**No table of figures entries found.**

[Table 1 Cruise Control Model Validation 3](#_Toc88564699)

[Table 2 Motor Speed Model Validation 4](#_Toc88564700)

# Introduction

This document contains information and details regarding the workflow used to create the PID controller, Tuning of PID and Generation of Code.

# Software Development Life Cycle

This section gives an over all view of the software development process used to develop the cruise control and motor speed model.

## Requirement Gathering

### PID controller

To design the PID controller using the following equations

Where,

### Cruise Control

To design the cruise control model with the give specifications

### Motor Speed

To design the motor speed model with the give specifications

### Code

To develop the code in accordance with ISO26262 and following Mishra Guidelines

## Design

### PID Controller

-Mention the process used to design the PID controller like creating the transfer function, converting transfer function to Z Transform

### PID Tuning Algorithm

-mention the script which is used to Tune the PID for the models

### Cruise Control

-UML diagrams, block diagrams

### Motor Speed

-UML diagrams, Block diagrams

## Coding

-Autocode generation procedures, Documentation procedures used.

## Testing

-Unit testing results, Polyspace statics analysis result.

## Validation

-Comparing requirements and output of Testing to validate.

Table 1 Cruise Control Model Validation

|  |  |  |
| --- | --- | --- |
| S.No | Requirements | Result |
| 1 | Rise time < 10s |  |
| 2 | Overshoot < 10% |  |
| 3 | Stead state error <1% |  |

Table 2 Motor Speed Model Validation

|  |  |  |
| --- | --- | --- |
| S.No | Requirements | Result |
| 1 | Rise time < 5s |  |
| 2 | Overshoot < 5% |  |
| 3 | Stead state error <1% |  |

# Advantages of the used SDLC model

* Mention the advantages of the SDLC model used with the development of the pid.

# GitHub Workflow

* Mention the github links.
* Paste the flow chart of comits and branches as a picture

# References