

**MEEM 5812: Automotive Control Systems**

**Spring, 2023**

**Project – 5**

**Rule Based Antilock Brakes**

**A person wearing a suit and tie

Description automatically generated with medium confidence**

**By**

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1. Plots showing your controller’s performance. The plot generated by the simulation with the three subplots is what I want here. Note that you should generate 2 plots (one for each road condition) for each of the 3 controllers (a total of 6 plots).

Ans. The plots showing controller’s performance are as follows:

I. Dry Surface Controller:

Chart

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Figure 1: Adhesion Coefficient vs Time plot for Dry Surface

Diagram

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Figure 2: Vehicle Simulation with ABS for Dry Surface

Chart

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Figure 3: Adhesion Coefficient vs Time plot for Wet Surface

Chart

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Figure 4: Vehicle Simulation with ABS for Wet Surface

II. Wet Surface Controller:

A picture containing graphical user interface

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Figure 5: Adhesion Coefficient vs Time plot for Dry Surface

Chart

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Figure 6: Vehicle Simulation with ABS for Dry Surface

Chart

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Figure 7: Adhesion Coefficient vs Time plot for Wet Surface

Chart, line chart

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Figure 8: Vehicle Simulation with ABS for Wet Surface

III. Combined Controller:

Chart

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Figure 9: Adhesion Coefficient vs Time plot for Dry Surface

Diagram

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Figure 10: Vehicle Simulation with ABS for Dry Surface

A picture containing text

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Figure 11: Adhesion Coefficient vs Time plot for Wet Surface

A picture containing graphical user interface

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Figure 12: Vehicle Simulation with ABS for Wet Surface

2. One page showing the stopping times for the 6 cases.

Ans. The stopping times for the 6 cases are as follows:

1. Dry surface controller for dry surface: 3.264 sec

2. Dry surface controller for wet surface: 3.741 sec

3. Wet surface controller for dry surface: 3.331 sec

4. Wet surface controller for wet surface: 3.511 sec

5. Combo controller for dry surface: 3.362 sec

6. Combo controller for wet surface: 3.512 sec