Autonomous Vehicle Simulation (AVS) Laboratory, University of Colorado

Basilisk Technical Memorandum

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ATTITUDE GUIDANCE DURING ORBIT BURN

Prepared by	H. Schaub

Status: First Release
Scope/Contents
Summary of the document goes here.

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Contents

1 Model Description 1

2 Module Functions 1

3 Module Assumptions and Limitations 1

4 Test Description and Success Criteria 2
4.1 Check 1 . . . 2

5 Test Parameters 2

6 Test Results 2
6.1 Unit Test Table Results . . . 2
6.2 Unit Test Figure Results . . . 3

7 User Guide 3

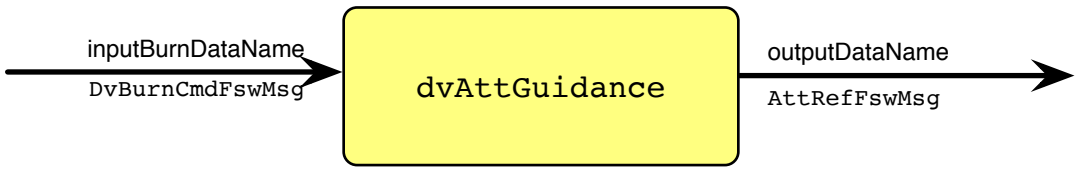

Fig. 1: Illustration of the module input and output messages.

1 Model Description

2 Module Functions

This section will contain a bullet-list and descriptions of what functions this module performs. For example:

- **Calculate A Thing**: This module calculates a thing with great precision
- **Communicate Something**: This module interfaces with X, Y, and Z via the messaging system.

3 Module Assumptions and Limitations

This section should describe the assumptions used in formulating the mathematical model and how those assumptions limit the usefulness of the module.

4 Test Description and Success Criteria

Describe the unit test(s) in here.

4.1 Check 1

There could be subsections for various checks done within the unit test.

5 Test Parameters

Test and simulation parameters and inputs go here. Basically, describe your test in the section above, but put any specific numbers or inputs to the tests in this section.

The unit test verify that the module output guidance message vectors match expected values.

Table 2: Error tolerance for each test.

Output Value Tested	Tolerated Error
outputVector	1e-12

6 Test Results

The results of the unit test should be included in the documentation. The results can be discussed verbally, but also included as tables and figures.

All of the tests passed:

Table 3: Test results

Check	Pass/Fail
1	PASSED
2	PASSED
3	PASSED

6.1 Unit Test Table Results

To automatically create a unit test table to include in the documentation, use the command:

```
unitTestSupport.writeTableLaTeX(
tableName,
tableHeaders,
caption,
dataMatrix,
path)
```

Here are the sample TEX table form the unit tests.

Table 4: Sample output table for param1 = 1 and param2 = 1.

time [s]	Output 1	Error	Output 2	Error	Output 3 $\boldsymbol{r}$	Error
0	2	0	1	0	0.7	0
0.5	3	0	1	0	0.7	0
1	4	0	1	0	0.7	0
1.5	2	0	1	0	0.7	0
2	3	0	1	0	0.7	0

6.2 Unit Test Figure Results

If figures and plots are generated in the python unit tests, these can be also automatically included in the unit test documentation. This is achieved with the command:

```
unitTestSupport.writeFigureLaTeX(
"testPlot",
"Illustration of Sample Plot",
```

Table 5: Sample output table for param1 = 1 and param2 = 3.

time [s]	Output 1	Error	Output 2	Error	Output 3 $\boldsymbol{r}$	Error
0	2	0	3	0	0.7	0
0.5	3	0	3	0	0.7	0
1	4	0	3	0	0.7	0
1.5	2	0	3	0	0.7	0
2	3	0	3	0	0.7	0

Table 6: Sample output table for param1 = 2 and param2 = 2.

time [s]	Output 1	Error	Output 2	Error	Output 3 $\boldsymbol{r}$	Error
0	3	0	2	0	0.7	0
0.5	4	0	2	0	0.7	0
1	5	0	2	0	0.7	0
1.5	3	0	2	0	0.7	0
2	4	0	2	0	0.7	0

```
plt,
"width=0.5\\textwidth",
path)
```

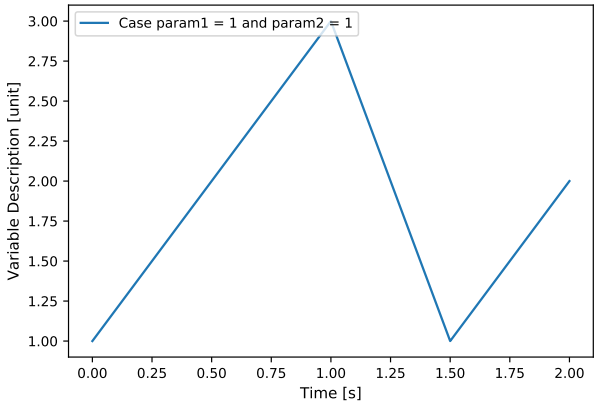

Fig. 2: Illustration of Sample Plot

7 User Guide

This section contains information directed specifically to users. It contains clear descriptions of what inputs are needed and what effect they have. It should also help the user be able to use the model for the first time.

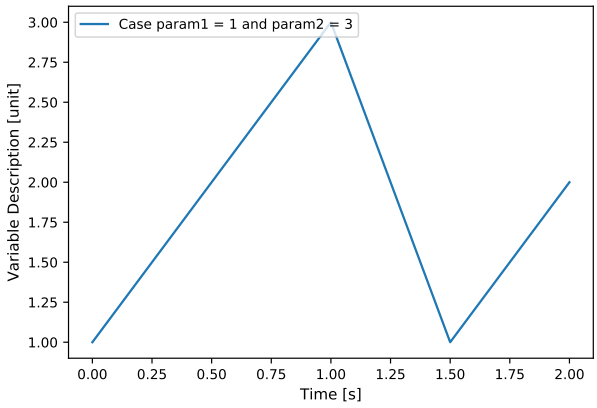

Fig. 3: Illustration of Sample Plot

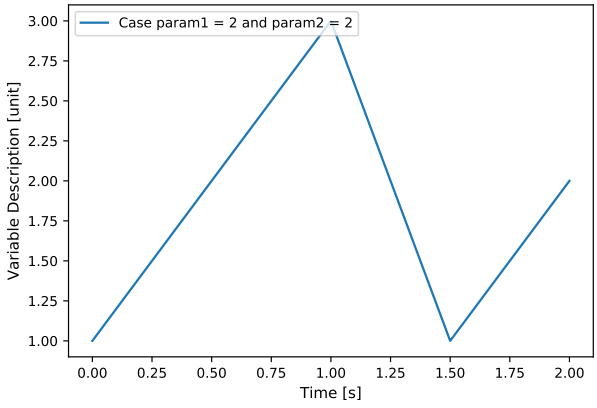

Fig. 4: Illustration of Sample Plot