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**Feature Documentation:  
Use Wingspan Slider Input To Affect  
Potential Paths Calculated for  
NASA EVA Path Phase 3  
Version 1.2**

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## i. Revision History

Revision	Author	Date	Description
1.0	Deepali Varma	8/12/18	Initial document.
1.1	Tenadam Weldesemayat	8/12/18	Reviewed document.
1.2	Lincoln Powell	8/12/18	Reviewed document.

# 1. Introduction

## 1.1 Background

The NASA EVA Navigator web application delivered from Phase 2 completed tailored backlog items designed by Daren to meet existing objectives for the product. One of the desired functionality remained in the backlog was the use the wingspan slider input to affect the potential paths calculated. The application delivered from Phase 2 showed path results for three routes which had gaps that exceeds the wingspan. For example:

Wingspan : 4 ft --> 48.0 in

Route 2

S0\_3429 [0.0 in.]

S0\_3428 [29.77 in.]

S0\_3437 [49.71 in.]

S0\_3442 [20.87 in.]

S0\_3459 [51.2 in.]

S0\_3462 [53.34 in.]

S0\_TRAY\_H1 [39.07 in.]

LAB\_0242 [55.55 in.]

LAB\_0247 [45.07 in.]

LAB\_0252 [42.83 in.]

LAB\_0256 [45.06 in.]

LAB\_0255 [54.08 in.]

LAB\_0259 [36.37 in.]

LAB\_0263 [23.75 in.]

LAB\_0269 [54.85 in.]

## 1.2 Intent

Daren's intent for this change is to use the wingspan slider input to affect the potential path calculated which does not exceeds the wingspan limit. Toward this goal, he desired to provide better information regarding each move a space walker will make in the International Space Station model.

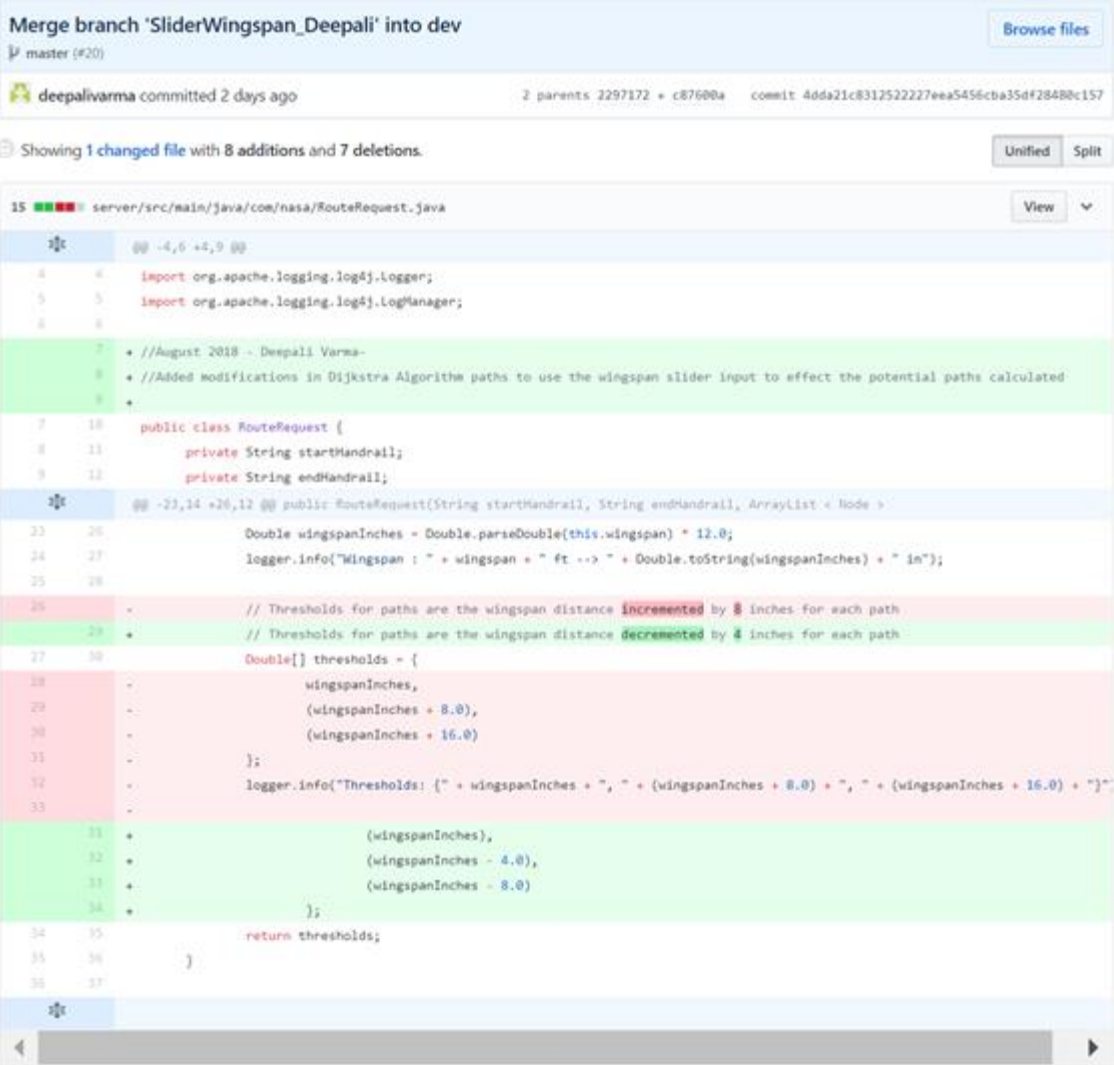
## 1.3 Agreed Change(s)

The use the wingspan slider input to affect the potential path calculated which does not exceeds the wingspan limit.

# 2. Development

## 2.1 Code Additions or Modifications

The changes made to EVA Navigator project to accomplish the use of wingspan slider input to affect the potential path calculated which does not exceeds the wingspan limit are in the RouteRequest.java file. The screenshots below show the code changes made to the project. The pink highlights demonstrate the lines removed and the light green once show additions (see Figure 1).



The screenshot shows a Git merge interface for merging branch 'SliderWingspan\_Deepali' into 'dev'. The commit is by deepalivarma, committed 2 days ago. It shows 1 changed file with 8 additions and 7 deletions. The file is server/src/main/java/com/nasa/RouteRequest.java. The code changes are as follows:

```
15  @@ -4,6 +4,9 @@
16  4  4  import org.apache.logging.log4j.Logger;
17  5  5  import org.apache.logging.log4j.LogManager;
18  6  6
19  7  7  //August 2018 - Deepali Varma-
20  8  8  //Added modifications in Dijkstra Algorithm paths to use the wingspan slider input to effect the potential paths calculated
21  9  9
22  10 10 public class RouteRequest {
23  11 11     private String startHandrail;
24  12 12     private String endHandrail;
25  13 13
26  14 14     @@ -23,14 +26,12 @@ public RouteRequest(String startHandrail, String endHandrail, ArrayList < Node >
27  15 15         Double wingspanInches = Double.parseDouble(this.wingspan) * 12.0;
28  16 16         logger.info("Wingspan : " + wingspan + " ft --> " + Double.toString(wingspanInches) + " in");
29  17 17
30  18 18         // Thresholds for paths are the wingspan distance incremented by 8 inches for each path
31  19 19         // Thresholds for paths are the wingspan distance decremented by 4 inches for each path
32  20 20         Double[] thresholds = {
33  21 21             wingspanInches,
34  22 22             (wingspanInches + 8.0),
35  23 23             (wingspanInches + 16.0)
36  24 24         };
37  25 25         logger.info("Thresholds: {" + wingspanInches + ", " + (wingspanInches + 8.0) + ", " + (wingspanInches + 16.0) + "}");
38  26 26
39  27 27         (wingspanInches),
40  28 28         (wingspanInches - 4.0),
41  29 29         (wingspanInches - 8.0)
42  30 30     };
43  31 31
44  32 32     return thresholds;
45  33 33
46  34 34 }
47  35 35
```

Figure 1. RouteRequest.java file changes to calculate distance according to wingspan.

## 3. Functional Testing

### 3.1 Proposed Functional Test Case

#### 3.1.1 Test Case 1: Set Wingspan slider to 4 feet

**Description:** The distances between each handrail should not exceed 4 Feet.

**Requirements:**

1. The route results of each route show distance that does not exceed the wingspan.

**Prerequisites:**

1. Start handrail drop-down menu must work as intended.
2. End handrail drop-down menu must work as intended.
3. The routes are calculated when the “Go” button is clicked.

**Steps:**

1. Load “EVA Navigator” web application by navigating browser to <http://127.0.0.1:3000> or <http://localhost:3000>.
2. Select S0\_3429 as the starting handrail.
3. Select LAB\_0269 as the ending handrail.
4. Select the “Go” button.
5. Click on the Path Results.
6. Check that the results for each route show distance in between the listings of each handrail.
7. Check the distances does not exceed the wingspan.

**Input:** Click on the starting handrail drop-down menu and select the “S0\_3429” handrail. Click on the ending handrail drop-down menu and select the “LAB\_0269” handrail. Click on the “Go” button. Click on the Path Results

**Expected Output:** Distance between each handrail path should not exceed the wingspan limit of 4 Feet (48’ inches).

**Assumptions:** None.

### 3.1.2 Test Case 2: Set Wingspan slider to 5 feet

**Description:** The distances between each handrail should not exceed 5 Feet.

**Requirements:**

1. The route results of each route show distance that does not exceed the wingspan.

**Prerequisites:**

1. Start handrail drop-down menu must work as intended.
2. End handrail drop-down menu must work as intended.
3. The routes are calculated when the “Go” button is clicked.

**Steps:**

1. Load “EVA Navigator” web application by navigating browser to <http://127.0.0.1:3000> or <http://localhost:3000>.
2. Select S0\_3429 as the starting handrail.
3. Select LAB\_0269 as the ending handrail.
4. Select the “Go” button.
5. Click on the Path Results.
6. Check that the results for each route show distance in between the listings of each handrail.
7. Check the distances does not exceed the wingspan.

**Input:** Click on the starting handrail drop-down menu and select the “S0\_3429” handrail. Click on the ending handrail drop-down menu and select the “LAB\_0269” handrail. Click on the “Go” button. Click on the Path Results

**Expected Output:** Distance between each handrail path should not exceed the wingspan limit of 5 Feet (60 inches).

**Assumptions:** None.



## **3.2 Assumptions and Constraints**

### **3.2.1 Assumptions**

It is assumed that the EVA Navigator web application has been setup and launched correctly, following the User\_Manual.docx, section 3, Software Installation based on your operating system.

### **3.2.2 Constraints**

None.

## **3.3 Findings**

All functional tests worked as expected, resulting in the desired behavior.