Feature Documentation: Add Indications of When Axial Direction and Plane Changes

for

NASA EVA Path Phase 3

Version 1.1

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i. Revision History

Revision	Author	Date	Description
1.0	Deepali Varma	8/9/18	Initial document.
1.1	Tenadam Weldesemayat	9/12/18	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 to add indications of when axial direction and plane changes.

1.2 Intent

Daren’s intent for this change is to add indications of when axial direction and plane changes in user interface. Toward this goal, he desired to provide better information in regards to each move a space walker will make in the International Space Station model.

1.3 Agreed Change(s)

Add indications of when axial direction and plane changes in the application. The project will not consider the external references during EVA that is the z axis. The application shall identify when an astronaut changes direction during translation.

2. Development

2.1 Feature Analysis

The ISS uses 3D coordinates that relate to naval terms. See https://goo.gl/images/DnCdU8
The project will not consider the external references during EVA that is the z axis. The term "zenith" is used for going in the negative direction on the z axis and "Nadir" is used for going in the positive z direction. Zenith is generally away from Earth and nadir is toward Earth.
The application shall identify when an astronaut changes direction during translation. Thus, if the astronauts are set on a path that will have them move only along the y axis, along a single face of the truss, by implementing this requirement it shall be very simple to determine the direction during translation. But if astronauts are to go part way along the y axis and then turn so they can

translate nadir along the z axis, then they must change their momentum. The changes in direction shall be flagged or highlighted.

The truss has several faces. See https://goo.gl/images/HgDGWV &

https://goo.gl/images/w5hJ1T

When an astronaut translates over the edges between these faces, they must rotate their suit. This also requires redirection of their momentum. These types of movements are required and there shall be visual indication for the change in momentum.

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

The current project is not three-Dimensional view of ISS. The requirement needs to detect the change in astronaut's direction and their momentum.

3.3 Findings

To implement this feature it is required to complete feature "Can the movement controls be improved to allow for 3-axis movement and 3-axis rotation?" and update current model to include all of ISS (data is provided in 0.2.0 release).