Testing 1D Motion Platform for 6D-IEC framework experiment

Royal North Shore Hospital

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This report shows the data acquired by D415 RealSense camera and by the 6DoF robot feedback during the experiment conducted by Alicja Kaczynska at Royal North Shore Hospital (03/07/2024). The motion traces that have been tested can be found on ShareDrive: Y:\PRJ-RPL\2RESEARCH\2\_ProjectData\IEC\Motion\_traces\Traces\_Jun2024\_expt

The three Simulated 1D traces for rotation (AP, SI, LR) are the same input file.

There are no statistics for 6D motion traces because the accuracy of the 6DoF platform is already well known and has already been tested in a clinical environment. Furthermore, the two motions have not been recorded by the same device so the two measurements are independent.

The “XX\_resp\_XX.txt” files are the 1DoF motion traces.

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# 1 DoF Platform overall accuracy

|  |  |
| --- | --- |
| Trace | 1DoF Motion traces |
| Mean (mm) | -0.2 |
| Std (mm) | 0.7 |
| 1st percentile (mm) | -1.7 |
| 99th percentile (mm) | 1.4 |

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| A large machine in a room  Description automatically generated |
| Figure 0: Experimental setup |

# 1.Mean\_Motion\_resp\_shifted\_gradual\_start

|  |  |
| --- | --- |
| Trace | 1.Mean\_Motion\_resp\_shifted\_gradual\_start |
| Mean (mm) | -0.2 |
| Std (mm) | 0.6 |
| 1st percentile (mm) | -1.2 |
| 99th percentile (mm) | 1.8 |

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| **A graph of a number of numbers and a number of red and blue dots  Description automatically generated with medium confidence** |
| Figure 1.1: 1.Mean\_Motion resp motion trace |

# 1.Mean\_Motion\_gradual\_start

|  |  |
| --- | --- |
|  | |
| A white background with black text  Description automatically generated | A close-up of a white background  Description automatically generated |
| Figure 1.2: 1.Mean\_Motion motion trace | |

# 2.Mean\_Motion2\_resp\_shifted\_gradual\_start

|  |  |
| --- | --- |
| Trace | 2.Mean\_Motion2\_resp\_shifted\_gradual\_start |
| Mean (mm) | -0.3 |
| Std (mm) | 0.8 |
| 1st percentile (mm) | -2.2 |
| 99th percentile (mm) | 1.7 |

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| **A graph of a graph  Description automatically generated with medium confidence** |
| Figure 2.1: 2.Mean\_Motion2 resp motion trace |

# 2.Mean\_Motion\_gradual\_start

|  |  |
| --- | --- |
| A graph of a diagram  Description automatically generated with medium confidence | |
| A white background with black text  Description automatically generated | A close-up of a white background  Description automatically generated |
| Figure 2.2: 2.Mean\_Motion motion trace | |

# 3.Mean\_Motion3\_resp\_shifted\_gradual\_start

|  |  |
| --- | --- |
| Trace | 3.Mean\_Motion3\_resp\_shifted\_gradual\_start |
| Mean (mm) | -0.1 |
| Std (mm) | 0.7 |
| 1st percentile (mm) | -1.7 |
| 99th percentile (mm) | 1.2 |

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| **A graph of a graph  Description automatically generated with medium confidence** |
| Figure 3.1: 3.Mean\_Motion3 resp motion trace |

# 3.Mean\_Motion\_gradual\_start

|  |  |
| --- | --- |
| A graph of a diagram  Description automatically generated with medium confidence | |
| A white background with black text  Description automatically generated | A close-up of a white background  Description automatically generated |
| Figure 3.2: 3.Mean\_Motion motion trace | |

# 4.Mean\_Motion4\_resp\_shifted\_gradual\_start

|  |  |
| --- | --- |
| Trace | 4.Mean\_Motion4\_resp\_shifted\_gradual\_start |
| Mean (mm) | -0.0 |
| Std (mm) | 0.7 |
| 1st percentile (mm) | -1.7 |
| 99th percentile (mm) | 1.4 |

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|  |
| Figure 4.1: 4.Mean\_Motion4 resp motion trace |

# 4.Mean\_Motion\_gradual\_start

|  |  |
| --- | --- |
|  | |
| A white background with black text  Description automatically generated | A close-up of a white background  Description automatically generated |
| Figure 4.2: 4.Mean\_Motion motion trace | |

# Simulated\_1D\_trace\_for\_rotation (AP)

|  |  |
| --- | --- |
| Trace | Simulated 1D trace for rotation (AP) |
| Mean (mm) | -0.6 |
| Std (mm) | 0.6 |
| 1st percentile (mm) | -1.8 |
| 99th percentile (mm) | 0.8 |

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| **A graph of a number of numbers  Description automatically generated with medium confidence** |
| Figure 5.1: Simulated 1D rotation motion trace (AP) |

# Simulated\_6D\_trace\_for\_rotation (AP)

|  |  |
| --- | --- |
| A graph of a motion line  Description automatically generated with low confidence | |
| A white background with black text  Description automatically generated | A close-up of a white background  Description automatically generated |
| Figure 5.2: Simulated 6D rotation motion trace (AP) | |

# Simulated\_1D\_trace\_for\_rotation (SI)

|  |  |
| --- | --- |
| Trace | Simulated 1D trace for rotation (SI) |
| Mean (mm) | -0.1 |
| Std (mm) | 0.7 |
| 1st percentile (mm) | -1.5 |
| 99th percentile (mm) | 1.5 |

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| **A graph of a number of numbers  Description automatically generated with medium confidence** |
| Figure 6.1: Simulated 1D rotation motion trace (SI) |

# Simulated\_6D\_trace\_for\_rotation (SI)

|  |  |
| --- | --- |
| A graph of a motion trace  Description automatically generated with medium confidence | |
| A white background with black text  Description automatically generated | A close-up of a white background  Description automatically generated |
| Figure 6.2: Simulated 6D rotation motion trace (SI) | |

# Simulated\_1D\_trace\_for\_rotation (LR)

|  |  |
| --- | --- |
| Trace | Simulated 1D trace for rotation (LR) |
| Mean (mm) | -0.1 |
| Std (mm) | 0.7 |
| 1st percentile (mm) | -1.7 |
| 99th percentile (mm) | 1.5 |

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| **A graph of a number of numbers  Description automatically generated with medium confidence** |
| Figure 7: Simulated 1D rotation motion trace (LR) |

# Simulated\_6D\_trace\_for\_rotation (LR)

|  |  |
| --- | --- |
| A graph of a motion trace  Description automatically generated with medium confidence | |
| A white background with black text  Description automatically generated | A close-up of a white background  Description automatically generated |
| Figure 6.2: Simulated 6D rotation motion trace (SI) | |