1D platform 0.2s vs 0.4s delay

The aim of this report is to compare the results when the Arduino board is taking each values of the input file (0.2s) or taking one in every two values (0.4s). The results show the mean, std, 1st et 99th percentile of the difference between the input file and the 1D platform motion recorded by RealSense. The results highlight also the latency between the 1D and the 6D platform. (Syncronisation of the combined system).

By delaying the 1D platform by 4.6s in the C# code, the combined system shows in average a **0.21s (from -0.01s to 0.45s) latency** for 299.8s long traces (30 traces).

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| --- | --- | --- |
|  | **0.2s** | **0.4s** |
| Mean (mm) | -0.308 | 0.26 |
| Std (mm) | 1.62 | 2.112 |
| 1st percentile (mm) | -3.982 | -4.5182 |
| 99th percentile (mm) | 3.508 | 5.59 |
| Latency (s) | **0.16** | **0.26** |

**1.Mean\_Motion**

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| --- | --- | --- | --- | --- | --- | --- |
|  | **0.2s** | | | **0.4s** | | |
| Tests | Test 1 | Test 2 | Test 3 | Test 4 | Test 5 | Test 6 |
| Mean (mm) | -0.32 | -0.16 | 0.02 | 0.8 | 1.47 | 0.84 |
| Std (mm) | 2.43 | 2.8 | 2.57 | 3.39 | 3.9 | 2.64 |
| 1st percentile (mm) | -5.06 | -5.39 | -4.83 | -7.23 | -7.34 | -6.1 |
| 99th percentile (mm) | 5.23 | 6.11 | 6.01 | 8.83 | 10.83 | 7.49 |
| Latency with 6D (s) | 0.35 | 0.15 | 0.35 | 0.17 | 0.41 | 0.45 |
| Latency with input (s) |  |  |  |  |  |  |
|  | | | | | | |
| Mean (mm) | -0.15 | | | 1.03 | | |
| Std(mm) | 2.6 | | | 3.31 | | |
| 1st percentile (mm) | -5.09 | | | -6.89 | | |
| 99th percentile (mm) | 5.78 | | | 9.05 | | |
| Latency with 6D (s) | 0.28 | | | 0.34 | | |

**2.Mean\_Motion2**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **0.2s** | | | **0.4s** | | |
| Tests | Test 1 | Test 2 | Test 3 | Test 4 | Test 5 | Test 6 |
| Mean (mm) | -0.04 | -0.44 | -0.54 | 0.79 | 0.46 | -0.17 |
| Std (mm) | 1.25 | 1.29 | 1.17 | 1.72 | 1.81 | 1.81 |
| 1st percentile (mm) | -2.88 | -3.5 | -3.33 | -2.78 | -3.62 | -4.38 |
| 99th percentile (mm) | 3.08 | 2.41 | 2.04 | 4.94 | 4.33 | 4.05 |
| Latency with 6D (s) | 0.10 | 0.10 | 0.2 | 0.47 | 0.18 | 0.42 |
| Latency with input (s) |  |  |  |  |  |  |
|  | | | | | | |
| Mean (mm) | -0.34 | | | 0.36 | | |
| Std(mm) | 1.24 | | | 1.78 | | |
| 1st percentile (mm) | -3.24 | | | -3.59 | | |
| 99th percentile (mm) | 2.51 | | | 4.44 | | |
| Latency with 6D (s) | 0.13 | | | 0.36 | | |

**3.High\_Motion**

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| --- | --- | --- | --- | --- | --- | --- |
|  | **0.2s** | | | **0.4s** | | |
| Tests | Test 1 | Test 2 | Test 3 | Test 4 | Test 5 | Test 6 |
| Mean | 0.2 | -0.19 | 0.11 | 0.33 | 0.88 | 0.16 |
| Std | 1.32 | 1.22 | 1.24 | 1.67 | 1.74 | 1.71 |
| 1st percentile | -3.01 | -3.13 | -2.85 | -3.47 | -2.63 | -3.2 |
| 99th percentile | 3.53 | 3.01 | 3.1 | 4.79 | 5.79 | 5.1 |
| Latency with 6D | 0.4 | 0.1 | 0.12 | -0.1 | 0.38 | -0.05 |
| Latency with input |  |  |  |  |  |  |
|  | | | | | | |
| Mean (mm) | 0.04 | | | 0.45 | | |
| Std (mm) | 1.26 | | | 1.71 | | |
| 1st percentile (mm) | -2.99 | | | -3.1 | | |
| 99th percentile (mm) | 3.21 | | | 5.23 | | |
| Latency with 6D (s) | 0.21 | | | 0.08 | | |

**4.Mean\_Complexity**

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| --- | --- | --- | --- | --- | --- | --- |
|  | **0.2s** | | | **0.4s** | | |
| Tests | Test 1 | Test 2 | Test 3 | Test 4 | Test 5 | Test 6 |
| Mean | 0.32 | 0.38 | 0.35 | -0.02 | 0.07 | 0.01 |
| Std | 1.11 | 1.13 | 1.1 | 1.64 | 1.72 | 1.71 |
| 1st percentile | -2.52 | -2.44 | -2.24 | -4.26 | -3.89 | -3.88 |
| 99th percentile | 3.12 | 3.14 | 3.15 | 3.92 | 5.07 | 4.72 |
| Latency with 6D | 0.1 | 0.01 | 0.1 | 0.25 | 0.25 | 0.25 |
| Latency with input |  |  |  |  |  |  |
|  | | | | | | |
| Mean (mm) | 0.35 | | | 0.02 | | |
| Std (mm) | 1.11 | | | 1.7 | | |
| 1st percentile (mm) | -2.4 | | | -4.01 | | |
| 99th percentile (mm) | 3.14 | | | 4.57 | | |
| Latency with 6D (s) | 0.07 | | | 0.25 | | |

**5.High\_Complexity**

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| --- | --- | --- | --- | --- | --- | --- |
|  | **0.2s** | | | **0.4s** | | |
| Tests | Test 1 | Test 2 | Test 3 | Test 4 | Test 5 | Test 6 |
| Mean | -1.58 | -1.53 | -1.2 | -0.92 | -0.31 | -0.45 |
| Std | 1.91 | 1.94 | 1.89 | 1.95 | 2.0 | 2.22 |
| 1st percentile | -6.53 | -6.44 | -5.59 | -4.92 | -4.49 | -5.58 |
| 99th percentile | 2.7 | 2.7 | 3.29 | 4.02 | 4.74 | 5.22 |
| Latency with 6D | 0.25 | 0.05 | 0.05 | 0.4 | 0.03 | 0.35 |
| Latency with input |  |  |  |  |  |  |
|  | | | | | | |
| Mean (mm) | -1.44 | | | -0.56 | | |
| Std (mm) | 1.91 | | | 2.06 | | |
| 1st percentile (mm) | -6.19 | | | -5.0 | | |
| 99th percentile (mm) | 2.90 | | | 4.66 | | |
| Latency with 6D (s) | 0.12 | | | 0.26 | | |