Trial Number	Reflectance	Position	Time	Ground Truth Pose (m)						Measured Pose (m)						Pose Error (m/degrees)					
				x	y	z	nx	ny	nz	x	y	z	nx	ny	nz	Δx	Δy	Δz	Norm	Δθ	sum of norm / angle
1	a	1	1	0.605	-0.03	0.015	1	0	0	0.572	-0.049	-0.015	0.997	0.038	-0.062	0.033	0.019	0.03	0.0485	4.185	
1	a	2	1	0.605	-0.03	-0.075	1	0	0	0.586	-0.048	-0.102	0.991	0.038	-0.121	0.019	0.018	0.027	0.0376	7.328	
1	a	1'	1	0.605	-0.03	0.015	1	0	0	0.576	-0.038	-0.007	0.999	0.025	0.001	0.029	0.008	0.022	0.0373	1.477	
1	m	1	1	0.605	0	0.015	1	0	0	0.566	0.009	-0.001	0.997	0.034	-0.063	0.039	-0.009	0.016	0.0431	4.15	
1	m	2	1	0.605	0	-0.075	1	0	0	0.568	0.018	-0.101	0.994	0.034	-0.099	0.037	-0.018	0.026	0.0487	6.03	
1	m	1'	1	0.605	0	0.015	1	0	0	0.567	0.009	-0.003	0.999	0.037	0.011	0.038	-0.009	0.018	0.0430	2.21	
2	a	1	1	0.605	-0.03	0.015	1	0	0	0.563	-0.051	-0.029	0.997	0.035	-0.06	0.042	0.021	0.044	0.0644	4.011	
2	a	2	1	0.605	-0.03	-0.075	1	0	0	0.575	-0.046	-0.104	0.99	0.034	-0.13	0.03	0.016	0.029	0.0447	7.75	
2	a	1'	1	0.605	-0.03	0.015	1	0	0	0.572	-0.048	-0.014	0.999	0.021	0.001	0.033	0.018	0.029	0.0475	1.21	
2	a	12	1	0.605	-0.03	-0.03	1	0	0	0.565	-0.038	-0.071	0.991	0.114	-0.064	0.04	0.008	0.041	0.0578	7.57	
2	a	21	2	0.605	-0.03	-0.03	1	0	0	0.577	-0.049	-0.055	0.998	-0.029	-0.051	0.028	0.019	0.025	0.0421	3.38	
2	m	1	1	0.605	0	0.015	1	0	0	0.569	0.011	-0.001	0.997	0.025	-0.065	0.036	-0.011	0.016	0.0409	4.01	
2	m	2	1	0.605	0	-0.075	1	0	0	0.571	0.017	-0.103	0.994	0.03	-0.096	0.034	-0.017	0.028	0.0472	5.82	
2	m	1'	1	0.605	0	0.015	1	0	0	0.572	0.011	-0.002	0.999	0.023	0.005	0.033	-0.011	0.017	0.0387	1.35	
2	m	12	2	0.605	0	-0.03	1	0	0	0.576	0.011	-0.049	0.993	0.097	-0.065	0.029	-0.011	0.019	0.0364	6.73	
2	m	21	2	0.605	0	-0.03	1	0	0	0.574	0.015	-0.055	0.998	-0.036	-0.047	0.031	-0.015	0.025	0.0426	3.44	
3	a	1	1	0.605	-0.03	0.015	1	0	0	0.569	-0.045	-0.012	0.997	0.024	-0.062	0.036	0.015	0.027	0.0474	3.8600	
3	a	2	1	0.605	-0.03	-0.075	1	0	0	0.577	-0.049	-0.104	0.992	0.035	-0.114	0.028	0.019	0.029	0.0446	6.9000	
3	a	1'	2	0.605	-0.03	0.015	1	0	0	0.582	-0.049	-0.006	0.999	0.021	0.01	0.023	0.019	0.021	0.0365	1.36	
3	a	12	2	0.605	-0.03	-0.03	1	0	0	0.573	-0.043	-0.055	0.994	0.091	-0.059	0.032	0.013	0.025	0.0426	6.23	
3	a	21	1	0.605	-0.03	-0.03	1	0	0	0.577	-0.047	-0.056	0.998	-0.038	-0.049	0.028	0.017	0.026	0.0418	3.57	
3	m	1	1	0.605	0	0.015	1	0	0	0.57	0.012	-0.001	0.997	0.025	-0.064	0.035	-0.012	0.016	0.0403	4.01	
3	m	2	2	0.605	0	-0.075	1	0	0	0.569	0.012	-0.102	0.995	0.021	-0.091	0.036	-0.012	0.027	0.0466	5.38	
3	m	1'	2	0.605	0	0.015	1	0	0	0.573	0.007	-0.004	0.999	0.016	0.002	0.032	-0.007	0.019	0.0379	0.96	
3	m	12	1	0.605	0	-0.03	1	0	0	0.576	0.013	-0.047	0.993	0.096	-0.057	0.029	-0.013	0.017	0.0360	6.42	
3	m	21	2	0.605	0	-0.03	1	0	0	0.576	0.011	-0.051	0.997	-0.039	-0.052	0.029	-0.011	0.021	0.0375	3.73	
4	a	1	1	0.605	-0.03	0.015	1	0	0	0.572	-0.047	-0.016	0.997	0.032	-0.061	0.033	0.017	0.031	0.0484	4	0.3741
4	a	2	1	0.605	-0.03	-0.075	1	0	0	0.575	-0.053	-0.104	0.991	0.025	-0.125	0.03	0.023	0.029	0.0476	7.36	40.86
4	a	1'	1	0.605	-0.03	0.015	1	0	0	0.578	-0.049	-0.005	0.999	0.019	0.006	0.027	0.019	0.02	0.0386	1.15	
4	a	12	1	0.605	-0.03	-0.03	1	0	0	0.577	-0.044	-0.059	0.993	0.09	-0.061	0.028	0.014	0.029	0.0427	6.31	
4	a	21	1	0.605	-0.03	-0.03	1	0	0	0.574	-0.047	-0.057	0.997	-0.04	-0.052	0.031	0.017	0.027	0.0445	3.79	
4	m	1	1	0.605	0	0.015	1	0	0	0.57	0.011	-0.002	0.997	0.026	-0.062	0.035	-0.011	0.017	0.0404	3.89	
4	m	2	2	0.605	0	-0.075	1	0	0	0.573	0.013	-0.101	0.992	0.028	-0.118	0.032	-0.013	0.026	0.0432	7.02	
4	m	1'	2	0.605	0	0.015	1	0	0	0.574	0.004	-0.005	0.999	0.022	0	0.031	-0.004	0.02	0.0371	1.28	
4	m	12	1	0.605	0	-0.03	1	0	0	0.582	0.01	-0.052	0.993	0.095	-0.069	0.023	-0.01	0.022	0.0334	6.76	
4	m	21	2	0.605	0	-0.03	1	0	0	0.578	0.011	-0.053	0.997	-0.037	-0.054	0.027	-0.011	0.023	0.0371	3.82	
5	a	1	1	0.605	-0.03	0.015	1	0	0	0.58	-0.0474	-0.0126	0.997	0.0315	-0.0668	0.025	0.0174	0.0276	0.0411	4.23	
5	a	2	1	0.605	-0.03	-0.075	1	0	0	0.585	-0.043	-0.106	0.995	0.028	-0.093	0.02	0.013	0.031	0.0391	5.57	
5	a	1'	1	0.605	-0.03	0.015	1	0	0	0.586	-0.0466	-0.008	1	0.0113	0.004	0.019	0.0166	0.023	0.0341	0.69	
5	a	12	1	0.605	-0.03	-0.03	1	0	0	0.58	-0.046	-0.069	0.99	0.114	-0.076	0.025	0.016	0.039	0.0490	7.92	
5	a	21	1	0.605	-0.03	-0.03	1	0	0	0.583	-0.045	-0.057	0.998	-0.028	-0.037	0.022	0.015	0.027	0.0379	2.72	
5	m	1	1	0.605	0	0.015	1	0	0	0.577	0.009	0	0.997	0.036	-0.065	0.028	-0.009	0.015	0.0330	4.26	
5	m	2	2	0.605	0	-0.075	1	0	0	0.577	0.018	-0.103	0.994	0.036	-0.102	0.028	-0.018	0.028	0.0435	6.23	
5	m	1'	2	0.605	0	0.015	1	0	0	0.578	0.006	-0.001	0.999	0.021	0.003	0.027	-0.006	0.016	0.0320	1.24	
5	m	12	1	0.605	0	-0.03	1	0	0	0.579	0.009	-0.047	0.995	0.087	-0.042	0.026	-0.009	0.017	0.0323	5.61	
5	m	21	2	0.605	0	-0.03	1	0	0	0.583	0.01	-0.051	0.999	-0.026	-0.031	0.022	-0.01	0.021	0.0320	2.39	
6	a	1	1	0.605	-0.03	0.015	1	0	0	0.582	-0.0473	-0.0075	0.997	0.0363	-0.070	0.023	0.0173	0.0225	0.0365	4.544	0.3175
6	a	2	1	0.605	-0.03	-0.075	1	0	0	0.584	-0.0388	-0.104	0.994	0.038	-0.104	0.021	0.0088	0.029	0.0369	6.53	44.894
6	a	1'	1	0.605	-0.03	0.015	1	0	0	0.581	-0.045	-0.014	0.999	0.0226	-0.0017	0.024	0.015	0.029	0.0405	1.3	12
6	a	12	1	0.605	-0.03	-0.03	1	0	0	0.587	-0.0379	-0.0547	0.99307	0.101	-0.058	0.018	0.0079	0.0247	0.0316	6.74	
6	a	21	2	0.605	-0.03	-0.03	1	0	0	0.585	-0.041	-0.056	0.998	-0.025	-0.046	0.02	0.011	0.026	0.0346	3.04	
6	m	1	1	0.605	0	0.015	1	0	0	0.592	0.011	0.001	0.996	0.035	-0.07	0.013	-0.011	0.014	0.0220	4.5	
6	m	2	1	0.605	0	-0.075	1	0	0	0.591	0.009	-0.104	0.992	0.039	-0.113	0.014	-0.009	0.029	0.0334	6.9	
6	m	1'	1	0.605	0	0.015	1	0	0	0.59	0.007	-0.001	0.999	0.032	-0.002	0.015	-0.007	0.016	0.0230	1.84	
6	m	12	1	0.605	0	-0.03	1	0	0	0.592	0.016	-0.05	0.992	0.097	-0.069	0.013	-0.016	0.02	0.0287	6.89	
6	m	21	2	0.605	0	-0.03	1	0	0	0.593	0.012	-0.055	0.998	-0.015	-0.042	0.012	-0.012	0.025	0.0302	2.61	
	a	1	2	0.605	-0.03	0.015	1	0	0	0.582	-0.0397	-0.006				0.023	0.0097	0.021	0.0326	4.74	0.3743
	a	2	1	0.605	-0.03	-0.075	1	0	0	0.584	-0.0394	-0.105				0.021	0.0094	0.03	0.0378	6.51	41.77
	a	1'	1	0.605	-0.03	0.015	1	0	0	0.583	-0.0443	-0.0144				0.022	0.0143	0.0294	0.0394	1.15	
	a	12	1	0.605	-0.03	-0.03	1	0	0	0.584	-0.044	-0.0558				0.021	0.014	0.0258	0.0361	6.11	13
	a	21	2	0.605	-0.03	-0.03	1	0	0	0.584	-0.0447	-0.0623				0.021	0.0147	0.0323	0.0412	2.49	
	m	1	1	0.605	0	0.015	1	0	0	0.585	0.0129	-0.004				0.02	-0.0129	0.019	0.0305	4.14	
	m	2	1	0.605	0	-0.075	1	0	0	0.585	0.0124	-0.0105				0.02	-0.0124	-0.064	0.0687	6.77	
	m	1'	2	0.605	0	0.015	1	0	0	0.585	0.006	-0.005				0.02	-0.006	0.02	0.0289	1.25	

Statistical Analysis

Distance Error		Normal Vector Error	
Sample Size	71	Sample Size	71
Sample Mean	0.0397	Sample Mean	4.138239437
Sample Std Dev	0.008005583202	Sample Std Dev	2.177242276
Results		Results	
Error Limit (m) (Requirements)	0.3048	Error Limit (in) (Requirements)	45
Likelihood of Sampling	0.00000000000	Likelihood of Sampling	0.00000000000
Error Limit (m) (Requirements)	0.1524	Error Limit (in) (p-value < 0.01)	10
Likelihood of Sampling	0.00000000000	Likelihood of Sampling	0.00709638986
Error Limit (m) (p-value < 0.01)	0.059	Error Limit (in) (p-value < 0.05)	9
Likelihood of Sampling	0.01581214588	Likelihood of Sampling	0.02554959371
Error Limit (m) (p-value < 0.05)	0.056	Method: 2-tail z-score	
Likelihood of Sampling	0.04150150961		

Trial Number	Reflectance	Position	Time	Ground Truth Pose (m)						Measured Pose (m)						Pose Error (m/degrees)						Statistical Analysis	
				x	y	z	nx	ny	nz	x	y	z	nx	ny	nz	Δx	Δy	Δz	Norm	Δθ	sum of norm / angle	Distance Error	Normal Vector Error
	m	12	1	0.605	0	-0.03	1	0	0	0.586	0.004	-0.05				0.019	-0.004	0.02	0.0279	5.87			
	m	21	1	0.605	0	-0.03	1	0	0	0.586	0.006	-0.054				0.019	-0.006	0.024	0.0312	2.74			
																					sum norm/angle/time	avg	
Encore	a	1	1	0.62	-0.035	0.015	1	0	0	0.591	-0.071	0.005	0.999	-0.0169	-0.0325	0.029	0.036	0.01	0.0473	2.1	0.2069	0.04137904667	
Encore	a	2	1	0.62	-0.035	-0.075	1	0	0	0.587	-0.0627	-0.0896				0.033	0.0277	0.0146	0.0455	2.74	7.84	1.568	
Encore	a	1'	1	0.62	-0.035	0.015	1	0	0	0.588	-0.0607	0.00156				0.032	0.0257	0.0134	0.0432	0.83			
Encore	a	1EL	1	0.62	-0.035	0.015	1	0	0	0.587	-0.039	0.0168				0.033	0.004	-0.001	0.0333	1.24	5	1	
Encore	a	1ER	1	0.62	-0.035	0.015	1	0	0	0.586	-0.043	0.029				0.034	0.008	-0.014	0.0376	0.93			