Lab1 Report

Quinn Thompson

Below are my responses for the report questions of Lab 1. At the end of this document is an appendix containing graphs and tables referenced in my responses.

Task 2:

3. Based on my observations of all the activities, the most useful attributes for distinguishing the sensor traces for different activities are the controller velocity, position, rotation, and angular velocity. Each attribute of the controllers maintains distinct patterns in the graphs for these statistics as seen in Figures 1-8. The mean values differ for each of these attributes for the given activities.

4. The less useful attributes for distinguishing the differences between activities are related to headset position, velocity, angular velocity, and rotation. None of the activities incentivized me to turn or move my head significantly. This is depicted in the graphs of the headset position over time, as each of the graphs for the different activities maintain the same relatively constant height outside of the graph for the sitting data. The means and variances for these attributes are also much closer together for each activity than for the other attributes, making the activities less distinguishable as those attributes for those activities maintain similar values over time.

5. Figures 17-23 contain the mean and variance for the significant attributes for the activities. The visualizations for these attributes can be found in Figures 1-8. These statistics and visualizations support my answers for 3 as they make clear distinctions between the activities. In each of the graphs, there is a noticeable repeated structure to the time series for each of the attributes for different activities which is distinct enough to distinguish between activities. The means for each of the attributes for the different activities are different for each activity, allowing for reasonable distinction between the types of activities.

6. An additional attribute to consider for distinguishing between activity types is acceleration. Acceleration will vary for certain activities on different sensors as they require different changes in speed at different time interval. Additionally, we can utilize this data to better identify the individual completing these tasks as certain people will complete tasks with a greater acceleration than others due to their physical capabilities. The graphs and summary statistics for kinetic energy for different sensors are provided in Figures 17-23 and Figures 24-30, respectively.

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Appendix:

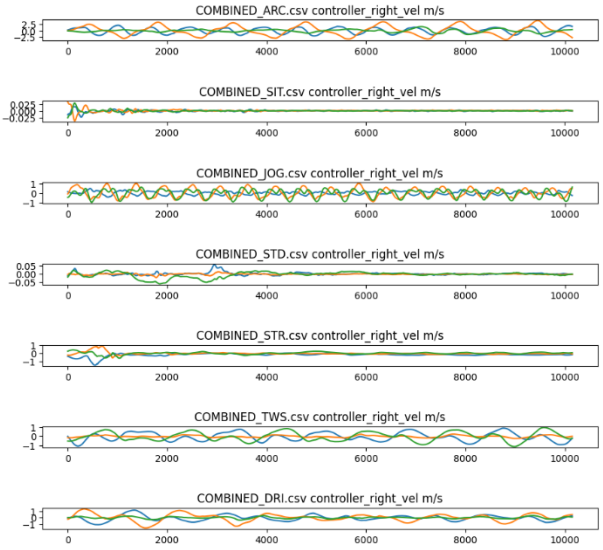

Figure 1: Time series plots of right controller velocity for each activity.

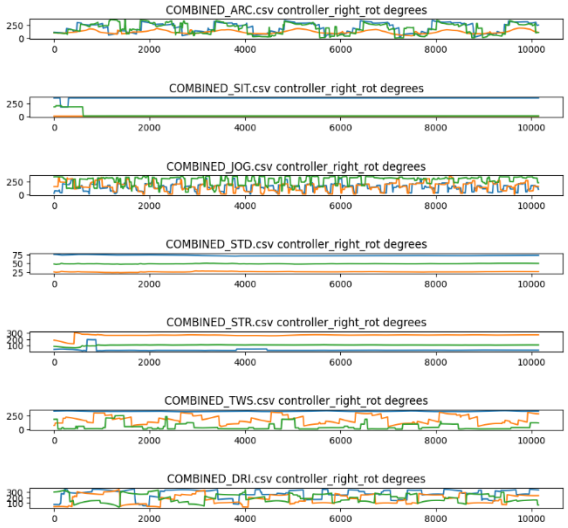

Figure 2: Time series plots of right controller rotation for each activity.

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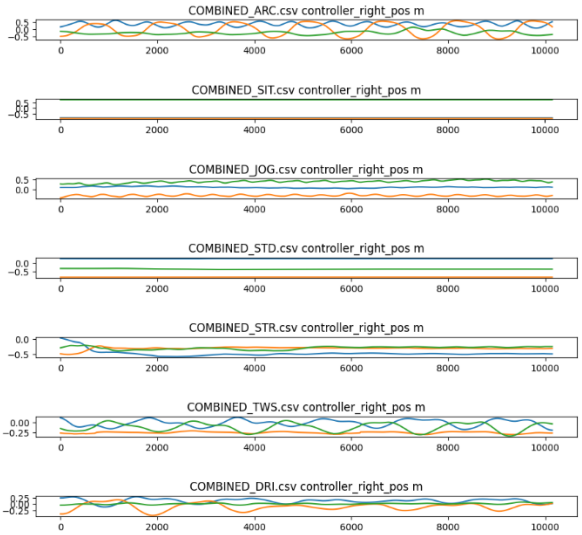

Figure 3: Time series plots of right controller position for each activity.

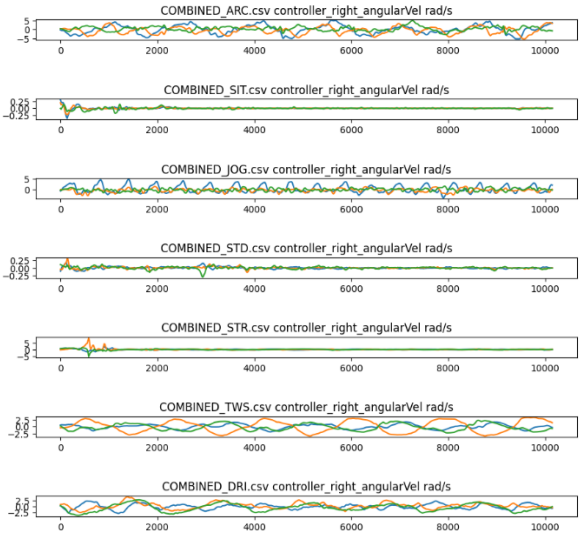

Figure 4: Time series plots of right controller angular velocity for each activity.

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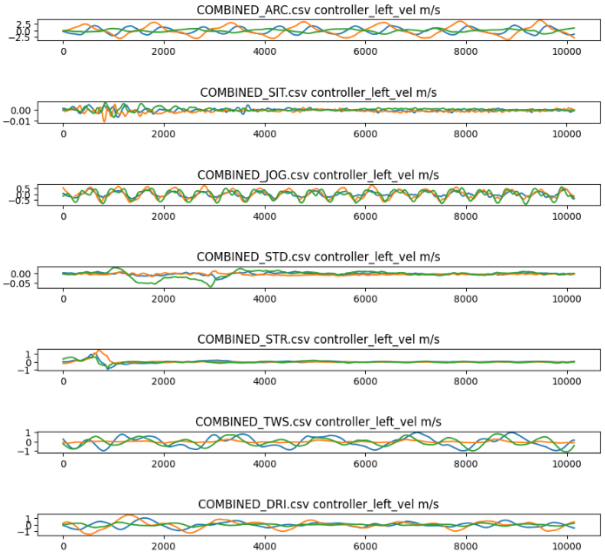

Figure 5: Time series plots of left controller velocity for each activity.

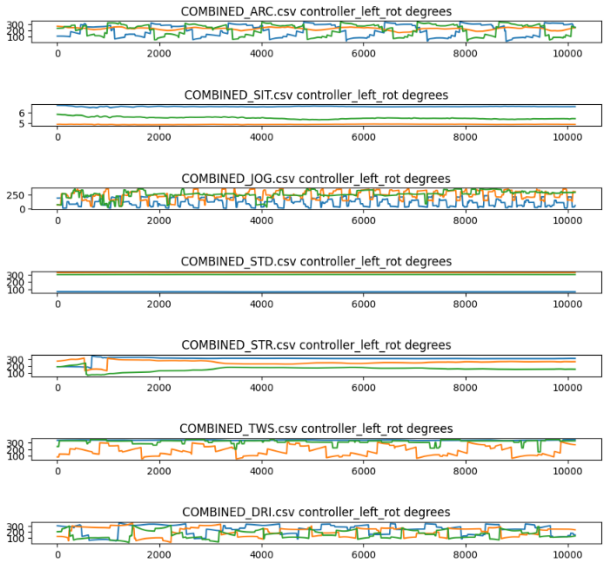

Figure 6: Time series plots of left controller rotation for each activity.

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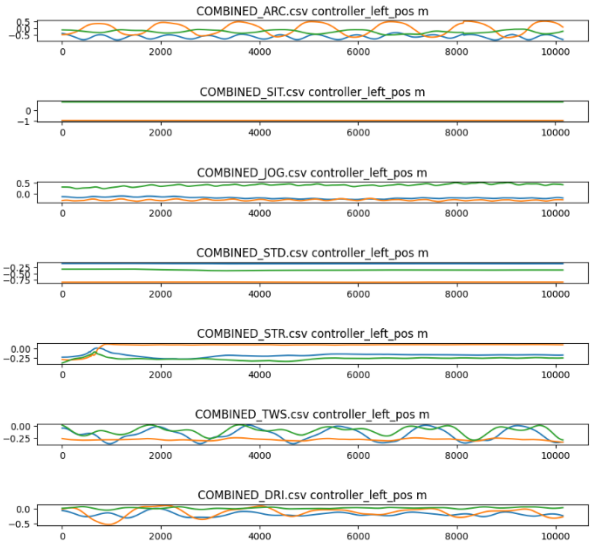

Figure 7: Time series plots of left controller position for each activity.

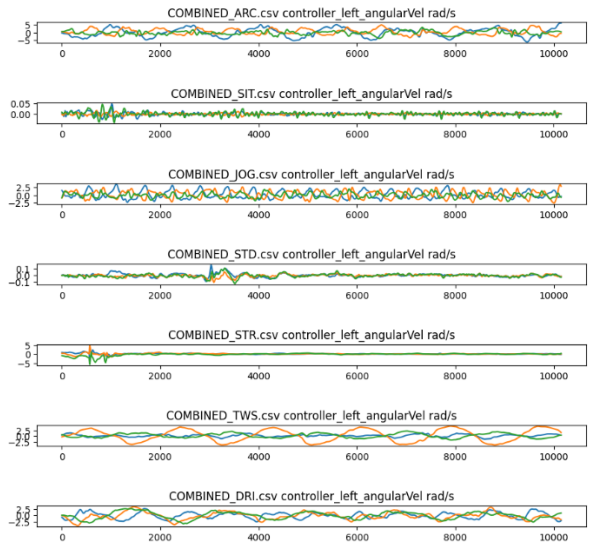

Figure 8: Time series plots of left controller angular velocity for each activity.

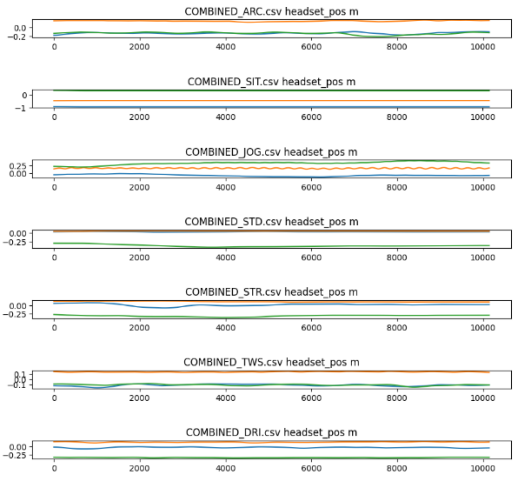

Figure 9: Time series plots of headset position for each activity.

	index	mean	variance
0	time	3762.776679910227	6638696.041858465
13	controller_left_vel.x	0.0036653118035061077	2.3120755721220116
14	controller_left_vel.y	-0.03903457607831875	4.121245641087092
15	controller_left_vel.z	0.0010290991073372785	0.31035356811983345
16	controller_left_angularVel.x	0.06786375780740378	9.378478400938196
17	controller_left_angularVel.y	0.3236022807230894	6.076903158036687
18	controller_left_angularVel.z	-0.2222049292700741	1.939619036228001
19	controller_left_pos.x	-0.4424586983624291	0.037213178006545486
20	controller_left_pos.y	-0.028683780602613597	0.2049826418809826
21	controller_left_pos.z	-0.14705286351713967	0.013575573612113692
22	controller_left_rot.x	141.05203614068873	13653.610945802828
23	controller_left_rot.y	163.98468829538515	886.1283598543844
24	controller_left_rot.z	156.38951476158823	11613.668796289345
25	controller_right_vel.x	-0.0029935335185331804	2.2001576383777057
26	controller_right_vel.y	-0.03495703887595151	3.9838525435703565
27	controller_right_vel.z	-0.00503697275834021	0.21888375510693528
28	controller_right_angularVel.x	0.17573753345726503	8.006460415831151
29	controller_right_angularVel.y	-0.3324219341438653	6.116432598335822
30	controller_right_angularVel.z	0.26955220521959555	1.8031244862146074
31	controller_right_pos.x	0.24945272393886642	0.033598162760852826
32	controller_right_pos.y	0.007594107444805732	0.19523807312015978
33	controller_right_pos.z	-0.17114458057377005	0.01023547238288591
34	controller_right_rot.x	138.43553484432798	12446.946474741866
35	controller_right_rot.y	86.389651417486	1469.166396242518
36	controller_right_rot.z	129.27683659530882	15603.442763533432

Figure 10: Mean and variance for arm circles data.

	index	mean	variance
0	time	3851.3340631929436	6958210.775692477
13	controller_left_vel.x	-0.0022414793120980334	0.2587839027368645
14	controller_left_vel.y	-0.004039364512885989	0.6026433012165306
15	controller_left_vel.z	0.0005750121734051367	0.030646608544880067
16	controller_left_angularVel.x	0.0003934208221674516 4	2.5370198571285107
17	controller_left_angularVel.y	-0.0702798188046919	3.4342188306718087
18	controller_left_angularVel.z	0.04677527640819046	2.91242577432136
19	controller_left_pos.x	-0.1518500961376685	0.011261853164904122
20	controller_left_pos.y	-0.08853339636927829	0.04316515375168519
21	controller_left_pos.z	0.024103876039230226	0.001170591209103333 7
22	controller_left_rot.x	176.21538183167894	12375.578378075605
23	controller_left_rot.y	153.4889515830757	12660.78494523221
24	controller_left_rot.z	112.76218891639517	9790.696757447642
25	controller_right_vel.x	-0.006642426458564278	0.3224673702735003
26	controller_right_vel.y	0.008609514991593948	0.6308516023556486
27	controller_right_vel.z	0.0008832265229797427	0.03546418400306609
28	controller_right_angularVel.x	0.004164633633563318	2.1850585188833707
29	controller_right_angularVel.y	0.20024453861536823	2.6205041544363503
30	controller_right_angularVel.z	-0.17605480404051613	4.058202099147271
31	controller_right_pos.x	0.09601593268442912	0.015314614959275072
32	controller_right_pos.y	-0.07528878977195728	0.04640422056547132

33	controller_right_pos.z	-0.001963000090376235	0.0014215902780519481
34	controller_right_rot.x	193.51175516492088	10997.038464204215
35	controller_right_rot.y	122.4873839748783	13359.276662360344
36	controller_right_rot.z	134.42900008783425	10590.083706571937

Figure 11: Mean and variance for driving data.

	index	mean	variance
0	time	3779.4072479592446	6697824.276564082
13	controller_left_vel.x	-0.004548667250710582	0.21152494656759643
14	controller_left_vel.y	0.005327266518432405	0.8675080786756907
15	controller_left_vel.z	-0.012408154449899554	0.5750415859738699
16	controller_left_angularVel.x	0.09112169375067151	9.258080403278083
17	controller_left_angularVel.y	0.14521320084740524	4.882741477151128
18	controller_left_angularVel.z	-0.06005827379579852	1.2284912461089437
19	controller_left_pos.x	-0.11477383200015896	0.003960697533214011
20	controller_left_pos.y	-0.21335369137244956	0.008711673048459215
21	controller_left_pos.z	0.17187784145223609	0.011228279716611654
22	controller_left_rot.x	88.31730465506124	15312.155141631474
23	controller_left_rot.y	169.02852824549933	16222.258191598963
24	controller_left_rot.z	174.58699233315866	14529.16678766838
25	controller_right_vel.x	-0.0031194569066756916	0.11313895748664789
26	controller_right_vel.y	0.015751099850807828	1.430922910234091
27	controller_right_vel.z	-0.013543235602235998	0.7060182877312113
28	controller_right_angularVel.x	0.13157610997652922	17.51573924142519
29	controller_right_angularVel.y	-0.3845487513528149	1.9545993883981834
30	controller_right_angularVel.z	-0.09589032832304342	1.201190540765015
31	controller_right_pos.x	0.11009426673957999	0.0030299172085305848
32	controller_right_pos.y	-0.19838476047968956	0.011404588606041688
33	controller_right_pos.z	0.16942886708357413	0.012481284348030187
34	controller_right_rot.x	113.94394613587897	16895.36316855189
35	controller_right_rot.y	110.54536202457471	19451.07821137834
36	controller_right_rot.z	190.62151597583292	12312.141913539863

Figure 12: Mean and variance for jogging data.

	index	mean	variance
0	time	3770.9867622601855	6673750.2048690645
13	controller_left_vel.x	-0.0002210144967578138 2	2.042695084378229e-06

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14	controller_left_vel.y	-0.0006062656982714338	2.2365876969419482e-06
15	controller_left_vel.z	0.0002588295441125447	1.6063194616072194e-06
16	controller_left_angularVel.x	7.936534010117823e-05	5.9393481735139395e-05
17	controller_left_angularVel.y	-5.115902376804493e-05	2.1375057514804925e-05
18	controller_left_angularVel.z	0.0002473230868487942	0.00010734565980000455
19	controller_left_pos.x	-0.6987525028243233	7.041442609326924e-08
20	controller_left_pos.y	-0.6744877906057462	8.620100851350025e-07
21	controller_left_pos.z	0.5220402629692694	4.381627990154817e-07
22	controller_left_rot.x	4.713088330103237	0.0010540541638285232
23	controller_left_rot.y	3.2813479353803134	0.0007481534261066498
24	controller_left_rot.z	3.6637646649262754	0.008067640136016775
25	controller_right_vel.x	-0.0001710555706920026	1.8621756705456098e-05
26	controller_right_vel.y	0.00031238537953330386	4.650197162810768e-05
27	controller_right_vel.z	-0.0001431754212601748	1.2382263064469304e-05
28	controller_right_angularVel.x	0.0002167666084193662	0.002100307453989388
29	controller_right_angularVel.y	4.2818619947570854e-05	0.0008414689421870114
30	controller_right_angularVel.z	-0.0024696850895525196	0.002838701792799356
31	controller_right_pos.x	-0.6195906845064626	8.922305962512286e-07
32	controller_right_pos.y	-0.6513854863415903	6.600802997137745e-07
33	controller_right_pos.z	0.5329860048799299	2.9248756946904536e-07
34	controller_right_rot.x	255.33103262133727	267.49287664494705

35	controller_right_rot.y	1.5525703791921053	0.023313308119930792
36	controller_right_rot.z	9.320118106442049	1145.6297651101092

Figure 13: Mean and variance for sitting data.

	index	mean	variance
0	time	3755.7577886535364	6614229.311332541
13	controller_left_vel.x	-0.0004958585827840905	5.818418900605944e-05
14	controller_left_vel.y	-0.001398117180081116	3.582786204601143e-05
15	controller_left_vel.z	-0.0007105456729880359	0.0002685998436875014 3
16	controller_left_angularVel.x	0.0007939435338573847	0.001344529618497715
17	controller_left_angularVel.y	-0.0001937223448046965 5	0.0006288276276819146
18	controller_left_angularVel.z	0.0006118766291661591	0.002430447706894653
19	controller_left_pos.x	-0.08106261248608945	2.2463864517883478e-05
20	controller_left_pos.y	-0.590851693374398	2.7816058258372216e-05
21	controller_left_pos.z	-0.2528477588946365	0.0004116753951767827 5
22	controller_left_rot.x	44.92707608463224	0.7371523386604427
23	controller_left_rot.y	236.43491247731558	1.1707268694698567
24	controller_left_rot.z	215.9833093464321	0.6093750084840364
25	controller_right_vel.x	0.0003829039944671376	0.0001158406685800389 2
26	controller_right_vel.y	-0.001898401641087318 3	2.9289443877874473e-05
27	controller_right_vel.z	-0.0010963207219604548	0.0002526204719476938
28	controller_right_angularVel.x	-0.0011709779354007754	0.001561422653124685
29	controller_right_angularVel.y	0.0014145302098822904	0.002296332394374724

30	controller_right_angularVel.z	0.002654029090728863	0.006723478513567654
31	controller_right_pos.x	0.17544148106200677	1.6166587445061448e-05
32	controller_right_pos.y	-0.579300799916857	1.328321949697539e-05
33	controller_right_pos.z	-0.24511845148397823	0.0004049180949463039 5
34	controller_right_rot.x	52.08623165745089	1.3290608170703866
35	controller_right_rot.y	18.281902301241914	4.298100860754831
36	controller_right_rot.z	32.553043434339976	3.039580464535334

Figure 14: Mean and variance for standing data.

	index	mean	variance
0	time	3708.838812519073	6450374.572421531
13	controller_left_vel.x	0.008934799606583497	0.035137325338603864
14	controller_left_vel.y	0.010977925340069665	0.02781304022087635
15	controller_left_vel.z	-0.0013467059135065305	0.04420542309513796
16	controller_left_angularVel.x	0.022944921097815374	0.1574920367107475
17	controller_left_angularVel.y	-0.0016155253457332621	0.14253030245760817
18	controller_left_angularVel.z	-0.06920879537450568	0.5345469061764127
19	controller_left_pos.x	-0.15514090051054272	0.005112009650092571
20	controller_left_pos.y	0.05410930724354657	0.005249877069543227
21	controller_left_pos.z	-0.17656338770774876	0.006608880702918466
22	controller_left_rot.x	226.38827038624524	556.8476797733073
23	controller_left_rot.y	194.39128125987295	559.7499773848824
24	controller_left_rot.z	94.42762657984382	506.6891369591064
25	controller_right_vel.x	-0.09648734927099675	0.05097890257102273
26	controller_right_vel.y	-0.015704974040008302	0.028289346614638312
27	controller_right_vel.z	-0.002334655839532853	0.06790143702588226
28	controller_right_angularVel.x	0.009521533631313191	0.22499090099286517
29	controller_right_angularVel.y	0.03431860295704032	0.4630517689702622
30	controller_right_angularVel.z	-0.0066767603808753255	0.30822887009966177
31	controller_right_pos.x	-0.35508470045770163	0.01042117120843567
32	controller_right_pos.y	-0.21565275937714118	0.002203602461375624
33	controller_right_pos.z	-0.208634103934578 7	0.010544873472372833
34	controller_right_rot.x	21.684819222727704	1244.9227021880963
35	controller_right_rot.y	189.0415584925945	410.05642018079664

36	controller_right_rot.z	73.39025339624722	54.824013280366536

Figure 15: Mean and variance for stretching data.

	index	mean	variance
0	time	3742.862220572849	6568759.153064343
13	controller_left_vel.x	-0.006642308265508692	0.5571609760197769
14	controller_left_vel.y	-0.0010963056937906986	0.02569331736401375
15	controller_left_vel.z	-0.017031816077256005	0.8204418701888978
16	controller_left_angularVel.x	0.10181343192713796	0.9607079629149989
17	controller_left_angularVel.y	0.10052132908688512	10.221142068785559
18	controller_left_angularVel.z	0.16203995039824856	1.3218153573183133
19	controller_left_pos.x	-0.1362301455055389	0.023651674963981184
20	controller_left_pos.y	-0.2010555233879836	0.0007407109533742552
21	controller_left_pos.z	-0.0767413314572211	0.020164486454249935
22	controller_left_rot.x	244.9249011093669	109.71822444627699
23	controller_left_rot.y	126.57313795211464	10384.33110118926
24	controller_left_rot.z	192.5244021330525	10761.600891852999
25	controller_right_vel.x	-0.006253282725375336	0.46869343948855413
26	controller_right_vel.y	-0.0017123898692556884	0.023859053660186275
27	controller_right_vel.z	-0.011589040922254793	0.6410643141399255
28	controller_right_angularVel.x	0.009761005857661998	1.977304711914753
29	controller_right_angularVel.y	0.012346027945694544	6.664519720377915
30	controller_right_angularVel.z	-0.07649501919540636	2.7885587187757293
31	controller_right_pos.x	-0.023912012423596665	0.017849985769986757
32	controller_right_pos.y	-0.1865620816436492	0.0009336736640329128
33	controller_right_pos.z	-0.08429919748341276	0.021555765716973218
34	controller_right_rot.x	234.2144566824547	26.683433095262526
35	controller_right_rot.y	129.73468913737068	10621.932107399862
36	controller_right_rot.z	39.27680940526856	10065.32881186156

Figure 16: Mean and variance for twisting data.

	index	headset_acceleration.x	headset_acceleration.y	headset_acceleration.z	controller_left_acceleration.x	controller_left_acceleration.y	controller_left_acceleration.z	**controller_right_acceleration.x**	controller_right_acceleration.y	controller_right_acceleration.z
1	mean	0.00112473008861531716	7.9718124571421418e-05	0.00022695920168971373	-0.003296156385176732	0.009023218347398564	-0.001957866119837648	**0.001140814047757191**	0.010915202537186298	-0.003622881530337382

2	std	0.00744013126755981	0.00422420708495915	0.00809067092892941 2	0.164498286638 6673	0.27409318410398154	0.07738783261961482	0.16425742606519914	0.27682168174351775	0.07813081817859355
3	min	-0.01885006186686023	-0.01447948340580666	-0.02804246668833166	-0.30764236421551169	-0.51253411334088879	-0.20381994669690937	-0.34448858373 7171	-0.50342409348225425	-0.21235169277965527
4	25%	-0.00431547406220105 2	-0.00210240384475482 35	-0.00480943055493513 1	-0.15476136601511185	-0.20151093050288268	-0.05305700965912132	-0.14966867241928045	-0.19559570505929688	-0.05112384707888347
5	50%	0.00098689105442384 54	0.00058686209313259 47	0.00067241204605845 02	-0.02177548680862 5115	0.00328261840174323 04	-0.00102190844339 4527	0.01794455650607846	0.00083405396054 85035	0.00378349084275 28654
6	75%	0.00643444156641740 25	0.00264032266993 1299	0.00569689911364 8375	0.14299940410934 66	0.21171952779143682	0.05650755244312364	0.14942980673316 86	0.21439034275555555	0.04085420540294 4696
7	max	0.01862467085169 6383	0.00902294584296 3764	0.01656346141666 714	0.29753309416636 19	0.58030512372400 92	0.16179340516929 27	0.32215049300490 384	0.57423692163349 4	0.23357235154133 707

Figure 17: Arm circles acceleration statistics

	index	head set_acceleration.x	head set_acceleration.y	head set_acceleration.z	controller_left_acceleration.x	controller_left_acceleration.y	controller_left_acceleration.z	controller_right_acceleration.x	controller_right_acceleration.y	controller_right_acceleration.z
1	mean	-0.00036625019401555036	-0.00019879921478180285	-5.72947916214333 9e-05	-0.00176181425857072 62	-0.00620798133389 1419	0.00028859068050 57957	-0.00477415422427 20906	0.00398346713330 5248	0.00102847511187 14759

2	std	0.00684515051380710	0.00543541693967497373	0.00248909749673465556	0.055542587767540466	0.085309392958980490	0.021916107687326717	**0.060858034121157034**	0.081725421234779200	0.019315668857097217
3	min	-0.018955351430329108	-0.016081582482970203	-0.008855956417529810	-0.132240639935675420	-0.214106471697344950	-0.061919568414923506	**-0.154289904479802680**	-0.226703953997115630	-0.051808897199386940
4	25%	-0.005592684642751982	-0.003627073239008338557	-0.001520571754417556700	-0.039986886609789475	-0.060488653981458154	-0.012224460297072665	**-0.047800030310860670**	-0.037555523709587480	-0.010883206720299110
5	50%	-1.07063379898987e-05	0.00013721859871351625	7.83398397278105656e-05	-0.003672156317907927600	0.004291892557378968	0.002922016684932210700	**-0.002881352864073188700**	0.015266523094538057	0.001667180594995941
6	75%	0.004294435125209237	0.003538522965300052200	0.001741099112913038000	0.035474066019627260	0.046701629505087945	0.014694216121579059	**0.032738641990132905**	0.054230802326937180	0.013705725518559364
7	max	0.016583947885384140	0.013224613214823946000	0.006340797761324510	0.151210193393512000	0.220392876273300100	0.054496545791184390	**0.169921944205424470**	0.196741192635214030	0.049621044026518187

Figure 18: Driving acceleration statistics

	index	headset_acceleration.x	headset_acceleration.y	headset_acceleration.z	controller_left_acceleration.x	controller_left_acceleration.y	controller_left_acceleration.z	**controller_right_acceleration.x**	controller_right_acceleration.y	controller_right_acceleration.z
1	mean	-0.000394255318843373100	0.00032707399831778965000	0.00159061070326176767	-0.000228095556324392000	0.00172535821796282700	-0.003186188339415968400	**-0.000299816070013090600**	0.00181470336005837800	-0.005407028707826545000

2	std	0.00519462877010038	0.03745244265929762	0.00915235281240490	0.028079457586492176	0.050240859405 05867	0.051346485383 36254	**0.022097735558092704**	0.066741341377 75788	0.056635810318 91015
3	min	-0.011126681479940842	-0.068952825818622228	-0.024879156683502330	-0.057292656949863290	-0.102407990419 81237	-0.123578398919 0049	**-0.058924886523 86712**	-0.128905547437 40462	-0.138103103878 6186
4	25%	-0.003953017553832202	-0.032749783750175 9	-0.004530917011284223	-0.023883114785 59992	-0.041065433522 89861	-0.041097179566 9681	**-0.016268809814 635424**	-0.055205188129 32871	-0.047335294771 81535
5	50%	-0.001304926682331939 5	0.001958703292463551 6	0.001863672298479987 5	-0.006072165818 376553	0.001884657316 2062765	0.012576251938 963438	**0.000524811764 441169**	-0.006489823484 878675	0.011830639950 392848
6	75%	0.002580395656634906	0.033871712954267 11	0.008548876022775036	0.025784691995 406367	0.045485437652 61512	0.036758706057 62864	**0.016137744035 380534**	0.060435483769 6985	0.040158301793 64869
7	max	0.015646372402835108	0.068260947207754437	0.020268466290073 86	0.068617312008 30117	0.112204644146 86421	0.087486969717 81136	**0.068447599569 76999**	0.145049253430 53307	0.086182062464 01361

Figure 19: Jogging acceleration statistics

	index	headset_acceleration.x	headset_acceleration.y	headset_acceleration.z	controller_left_acceleration.x	controller_left_acceleration.y	controller_left_acceleration.z	**controller_right_acceleration.x**	controller_right_acceleration.y	controller_right_acceleration.z
1	mean	-0.00016854726074690208	0.00011860764264542982	-0.00032124956838922253	-3.935004407722 5707e-05	-0.00014624142744833614	5.547232712322 922e-05	**-6.617512192702 797e-05**	4.408498344368 5245e-05	-1.841438774986 176e-05
2	std	0.00102028234726931739	0.00061373	0.00157537986192838 9	0.00019518508870707514	0.00020132686200260 62	0.00019832357275566088	**0.00047433897317534417**	0.00061418595346 5337	0.00045141995418526704

		572951	526625							
3	min	-0.00648480676225475	-0.00152412739873227271	-0.00927835982796185252	-0.000952174669355252 8	-0.001516786431422562	-0.000974675404763390 7	**-0.003304496563242173**	-0.005210637729933856	-0.003307783550313635 3
4	25%	-0.00011177728493844 36	-7.82720450456396 8e-05	-0.00011320195878510986	-0.000130410201639174 45	-0.000237832144738209 18	-4.074272838762445e-05	**-0.000168836544319215 63**	-2.990940716930 4726e-05	-0.000123203642314146 38
5	50%	1.20321573376215 56e-05	1.07330213354173 93e-05	-9.03119712284912e-06	-4.422087112715782e-05	-0.000144026916732884 3	4.574685958465 4146e-05	**-2.986775279983 3054e-05**	6.364960916629 853e-05	-2.611227187363 227e-05
6	75%	0.00013047089287879454	0.00011112019139608895	9.23349422047752 5e-05	4.235029865121 0444e-05	-3.060006690978 081e-05	0.00013 1215360 7285531 9	**0.00011 4645618 6796742 2**	0.00013 4203421 6300779	7.40527 5291576 985e-05
7	max	0.00120887970538396 4	0.00446326388067783 6	0.00267464501901610 53	0.00064 6892505 0181563	0.00064 0714034 3155811	0.00094 7812144 5007771	**0.00226 8496725 8473584**	0.00434 3077175 189593	0.00403 0662827 191986

Figure 20: Sitting acceleration statistics

	index	headset_acceleration.x	headset_acceleration.y	headset_acceleration.z	controller_left_acceleration.x	controller_left_acceleration.y	controller_left_acceleration.z	**controller_right_acceleration.x**	controller_right_acceleration.y	controller_right_acceleration.z
1	mean	-1.24459952843461 06e-05	6.39113175157386 6e-05	-0.00009279511012371413	-0.00017260171714326465	-0.00046431491855805 01	-0.00041655422459663005	**0.00010872868364074901**	-0.00026833560698530 77	-0.00064214101411320 14
2	std	0.00123896849 50	0.00091374922 92	0.00311924041466708 1	0.00087943814193674 58	0.00057547350341918 44	0.00253 3500953 6800604	**0.00119 7952767 4439597**	0.00051 0595186 2637383	0.00245 2085806 911324

		582151	054663							
3	min	-0.00502771170561657	-0.00190892806911524007	-0.0069097960972800096	-0.004691487891776913	-0.002147083069461937	-0.009772798536398208	**-0.001979953237410046 5**	-0.003148986906300516 7	-0.008615094305251573
4	25%	-0.00059232243525730676	-0.00030647141405459833	-0.00475330505153377	-0.000626127020859142 8	-0.000846012903167063 6	-0.000805407370178303 5	**-0.000495240968839653 2**	-0.000485766859297712 84	-0.001077848203678703
5	50%	9.94790406832313 6e-05	-7.36533924667659 4e-05	0.00021902881114739414	-1.548266373241845 5e-05	-0.000488665589973299 8	0.000205613217738516 26	**-9.630658140625 3e-07**	-0.000260250406879163 7	-1.950450454534614e-05
6	75%	0.00055767600076513 6	0.00018737438385538582	0.00146553884099177 31	0.000371372189097317 74	-0.000190152207987396 48	0.001057344081008750 7	**0.000422347727087904 97**	-5.532408001165211 5e-06	0.000673906660421258 5
7	max	0.00419426537258694	0.00534194724999104066	0.00369897461055949 43	0.001609974761969108	0.001971986898222292	0.004623683242969278	**0.007847061261600884**	0.001775411311400649	0.003199300141563117 5

Figure 21: Standing acceleration statistics

	index	headset_acceleration.x	headset_acceleration.y	headset_acceleration.z	controller_left_acceleration.x	controller_left_acceleration.y	controller_left_acceleration.z	**controller_right_acceleration.x**	controller_right_acceleration.y	controller_right_acceleration.z
1	mean	-0.00056999336542449 94	-0.00029957314097075 23	-0.00035375175508278533	0.002976174536532937	0.005598087100661 37	0.000879677144571290 7	**-0.026374424919340875**	-0.002755845546324643 3	0.001986865465458569 2

2	std	0.00956843302148285	0.00223616541627690589	0.00413187589908926	0.026371282548409	0.029111825655326	0.022945986809237196	0.029176889822626898	0.023463795091135	0.021178082478391647
3	min	-0.03007397904158885	-0.00807220217634299	-0.01182932710115567	-0.1296534076859351	-0.0298123604506069	-0.1054299042910711	-0.2143499493042519	-0.0794801199049504	-0.0865740177283688
4	25%	-0.00467422542439454	-0.00130378219475808	-0.00216018448887354	-0.0022067148649922	-0.0020067710599029	-0.0095893206919260	-0.0287737190600620	-0.0110929837778037	-0.0076635664831197
5	50%	0.00032202335522322757	-2.19919190262681e-05	-6.56857820798038e-05	0.0022774071409021332	5.766039094788e-05	-0.0017236228187920025	-0.0219447297601839	-0.0065363387302373	0.0034532512006775
6	75%	0.00320491424810515 7	0.00086054285890841332	0.00161197791013233 1	0.0083899217994963 54	0.0022431275793909707	0.0065370197480190 88	-0.0143331554671651 09	-0.0012290878372248448	0.0140493228916847 2
7	max	0.02829641260601192 8	0.00777444352862140 2	0.01236241892526290 5	0.15134586306900924	0.21380475121364567	0.09147552943766026	0.00620311839257835 7	0.13181907110437216	0.0628883142662412

Figure 22: Stretching acceleration statistics

	index	headset_acceleration.x	headset_acceleration.y	headset_acceleration.z	controller_left_acceleration.x	controller_left_acceleration.y	controller_left_acceleration.z	controller_right_acceleration.x	controller_right_acceleration.y	controller_right_acceleration.z
1	mean	0.00017453048157033862	-0.00025316169675951 76	-0.00019954610189356 7	-0.0055855835721818 05	-0.0012314931916433975	-0.0070391794767339 28	-0.0060933989988113 03	-0.0005170681876346669	-0.0010775877905394 93

2	std	0.0067128778384092916	0.00411657824740381 1	0.00576059184897645 3	0.07873901161796036	0.012842310350325974	0.0617834683972185	0.0659139482302918	0.014395570912484 65	0.06932673374776102
3	min	-0.01348720820863 65	-0.00892853075078059 3	-0.01888760980731953 7	-0.14265747575402207	-0.02385922308414534 6	-0.1592734726083091	-0.1523780915317838	-0.0334809008850208 1	-0.1609728297211515 7
4	25%	-0.00471935763688760 2	-0.00347694172084272 87	-0.00347859419308228 6	-0.0701689909949675	-0.0102106016816607 05	-0.0502542175552250 6	-0.0557674537955478 24	-0.0103497457129765 12	-0.0541690503676638
5	50%	-0.00055649731222812 08	2.0383995225147534e-05	0.00069766567048983 52	-0.0011595673516856548	-0.0043773606742371 24	-0.0078640330917597 57	-0.0102947603790913 19	-0.0033146985621568385	-0.0057349440689605 87
6	75%	0.00421208272927120 8	0.00303929711318380 63	0.00303092792719204 63	0.0657276406096161 3	0.0051938847867457 57	0.0396009976461361 2	0.0517084187675137 1	0.0094019518222484 17	0.0576598462164700 44
7	max	0.02141982663977 76	0.00829941124120270 3	0.01331332130895251	0.1439241940818436 2	0.0380874843847160 7	0.1215799695801270 8	0.1299667542756926 5	0.0385498442326380 6	0.1407620524720818

Figure 23: Twisting acceleration statistics

Quinn Thompson

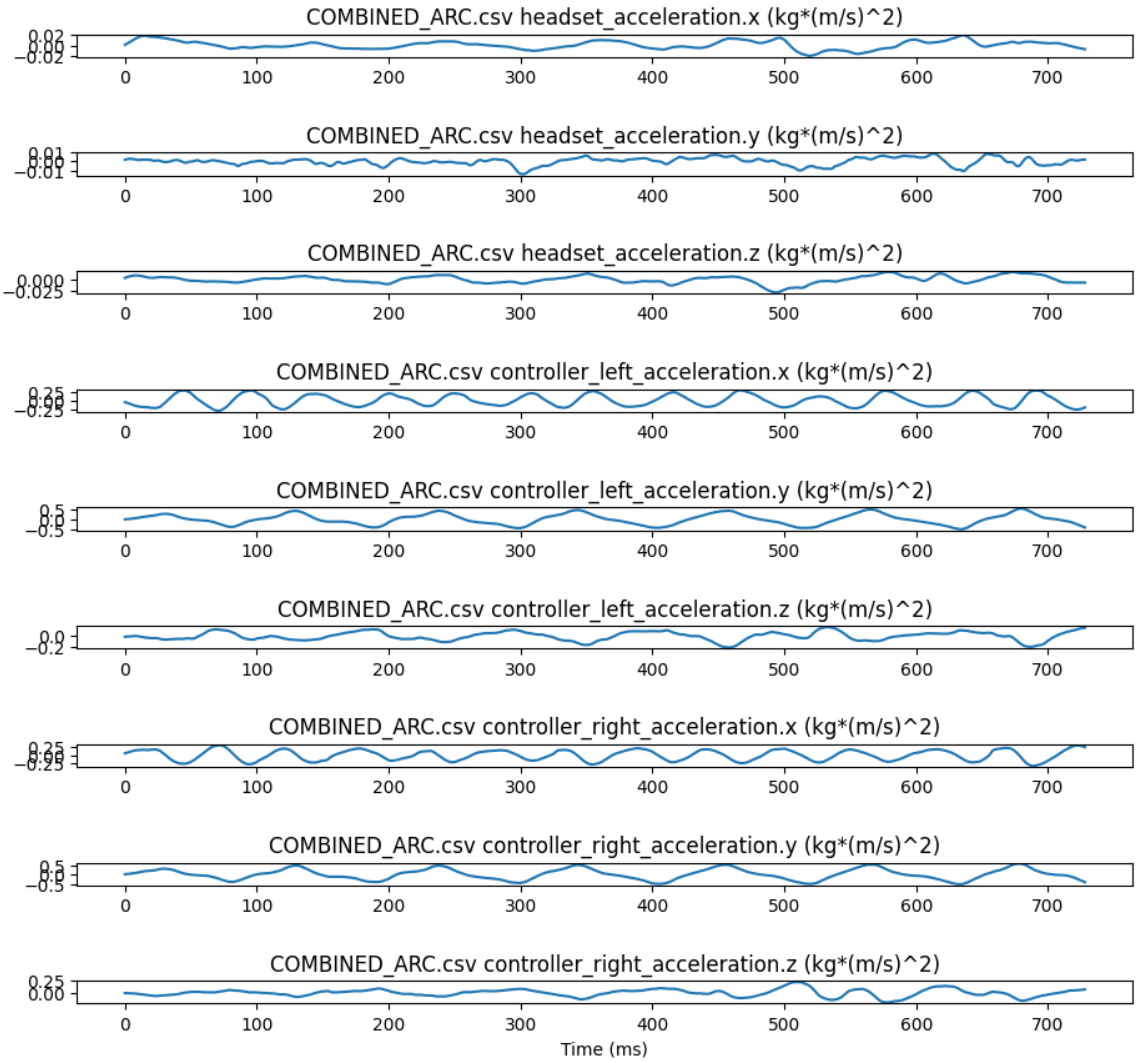

Figure 24: Acceleration plots for arm circles

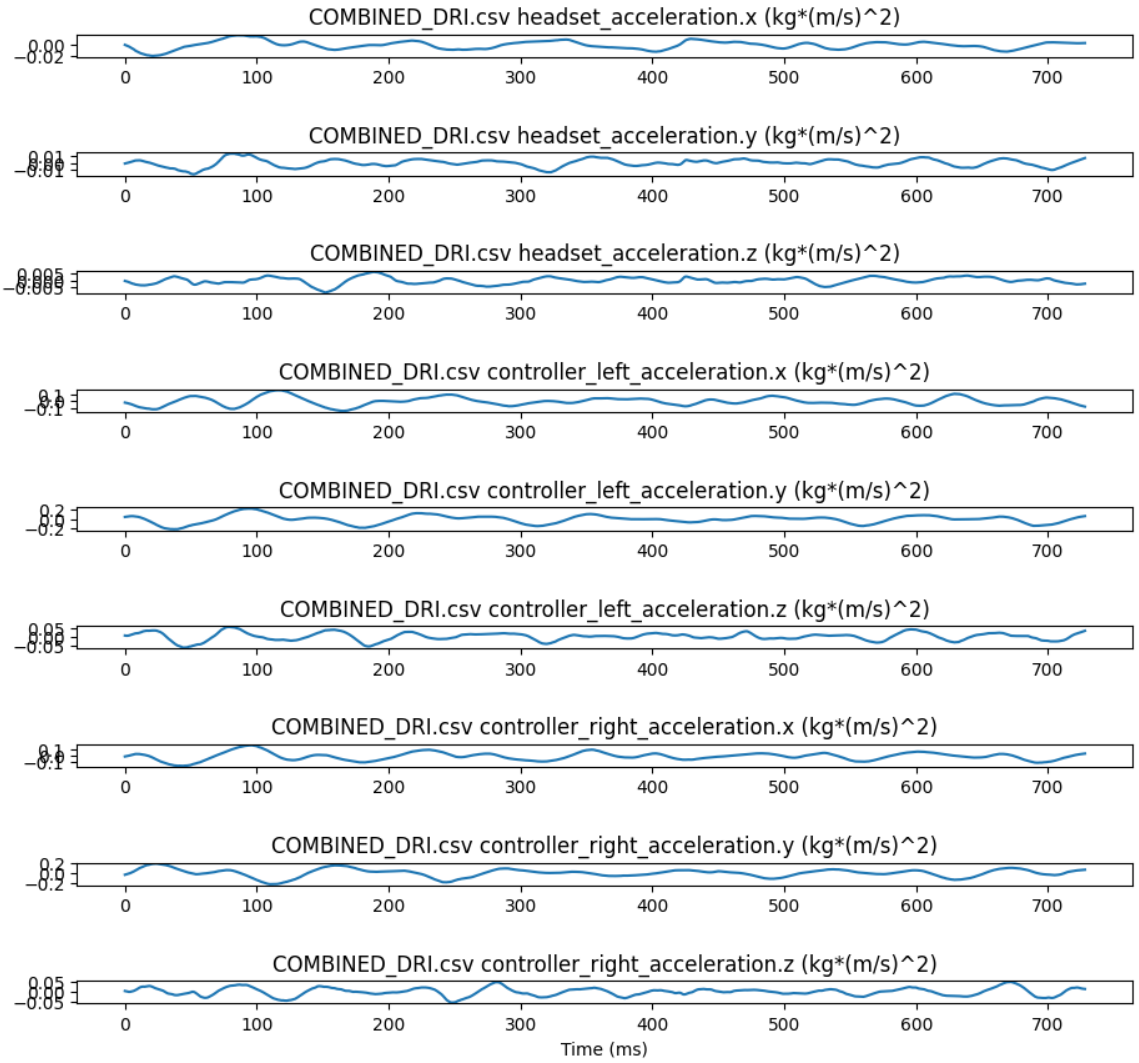

Figure 25: Acceleration plots for driving

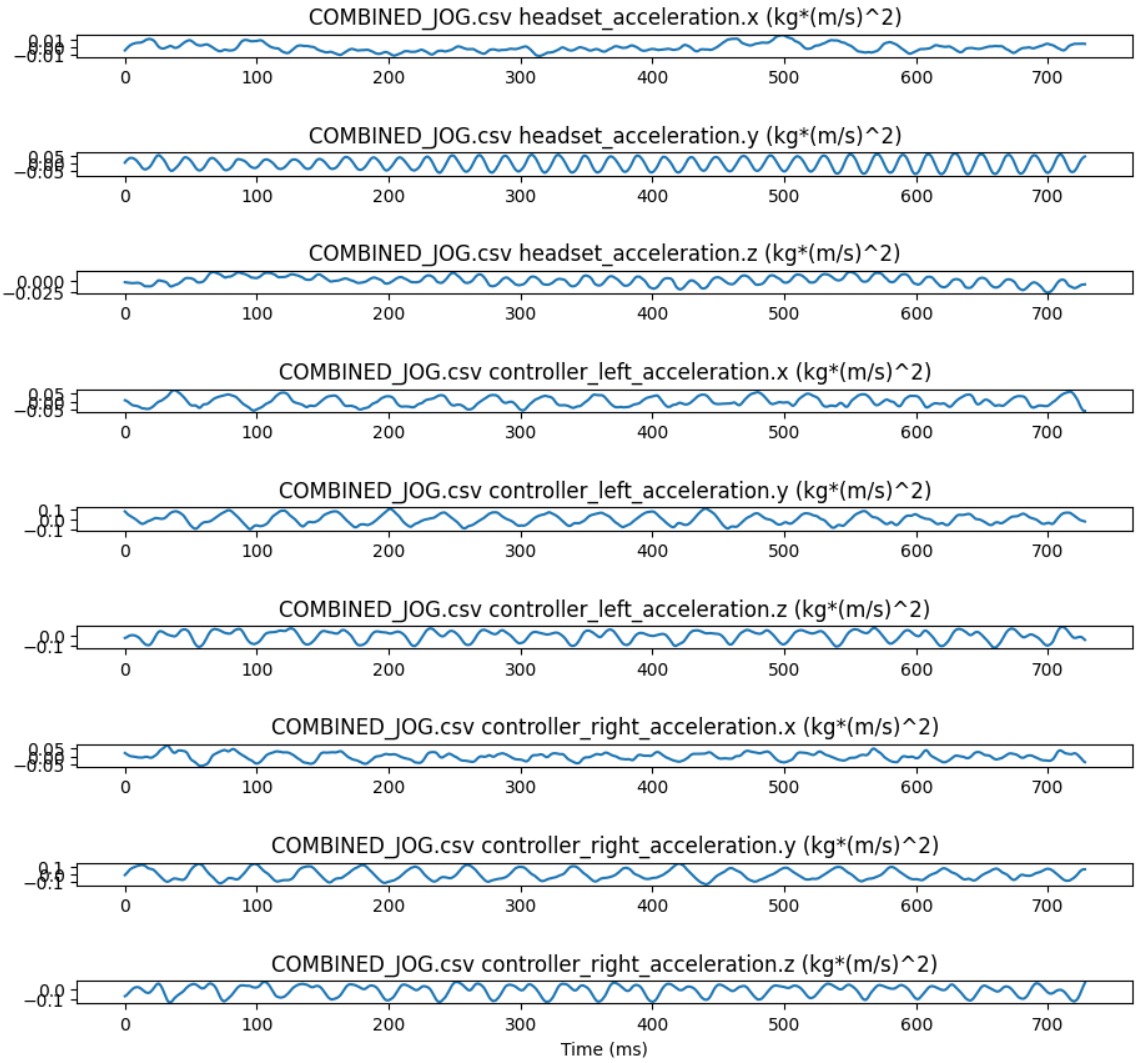

Figure 26: Acceleration plots for jogging.

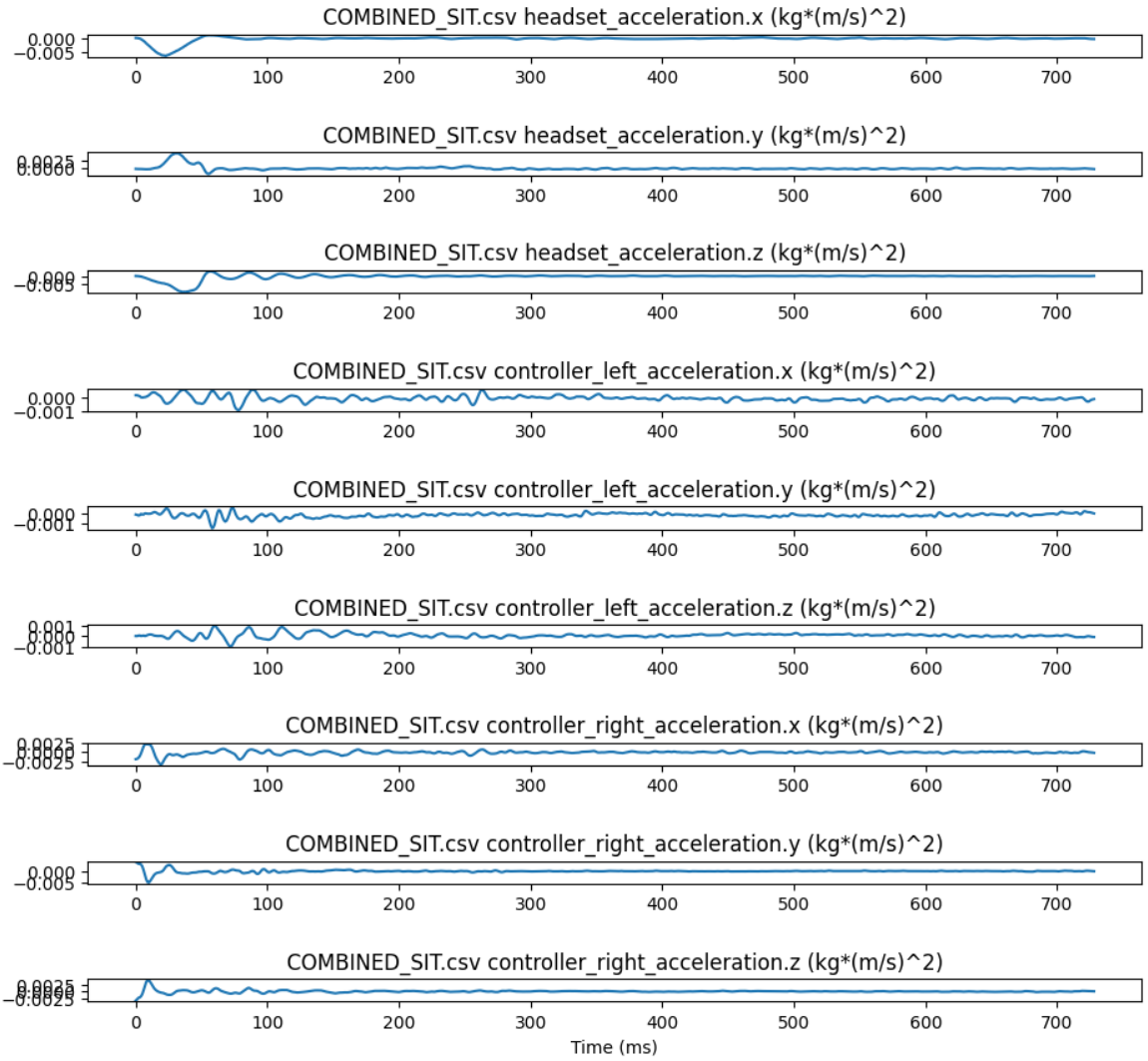

Figure 27: Acceleration plots for sitting.

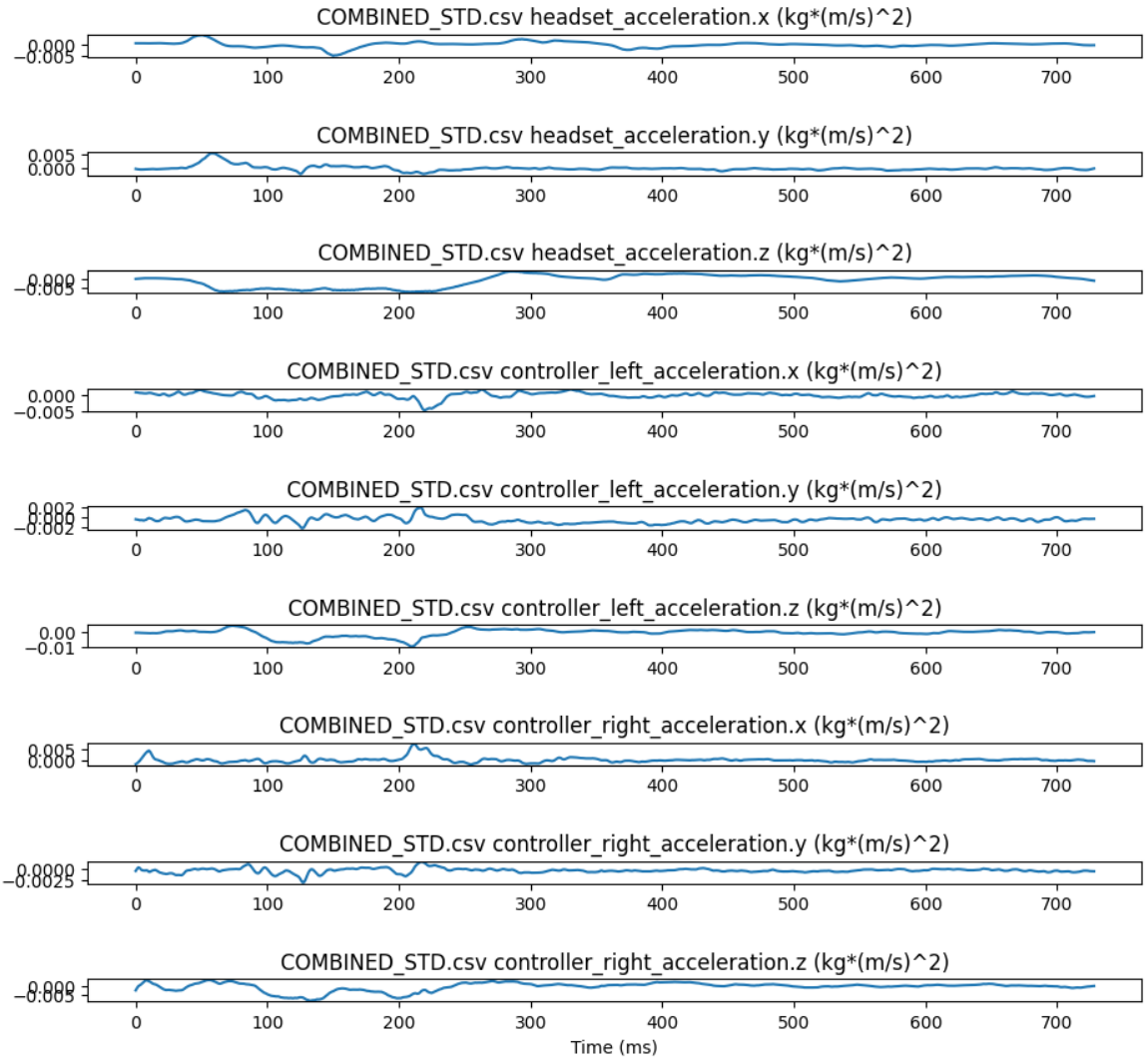

Figure 28: Acceleration plots for standing.

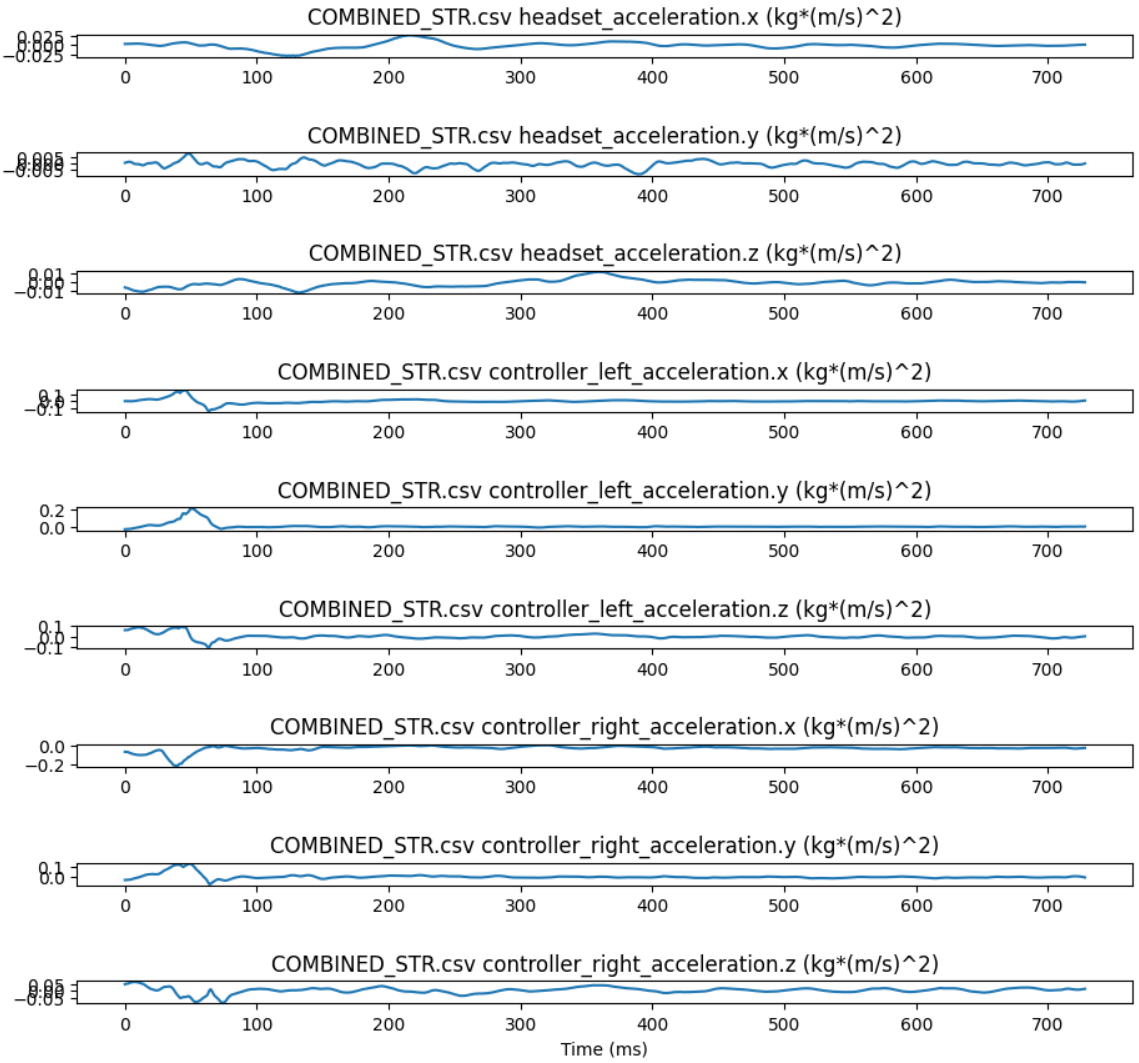

Figure 29: Acceleration plots for stretching.

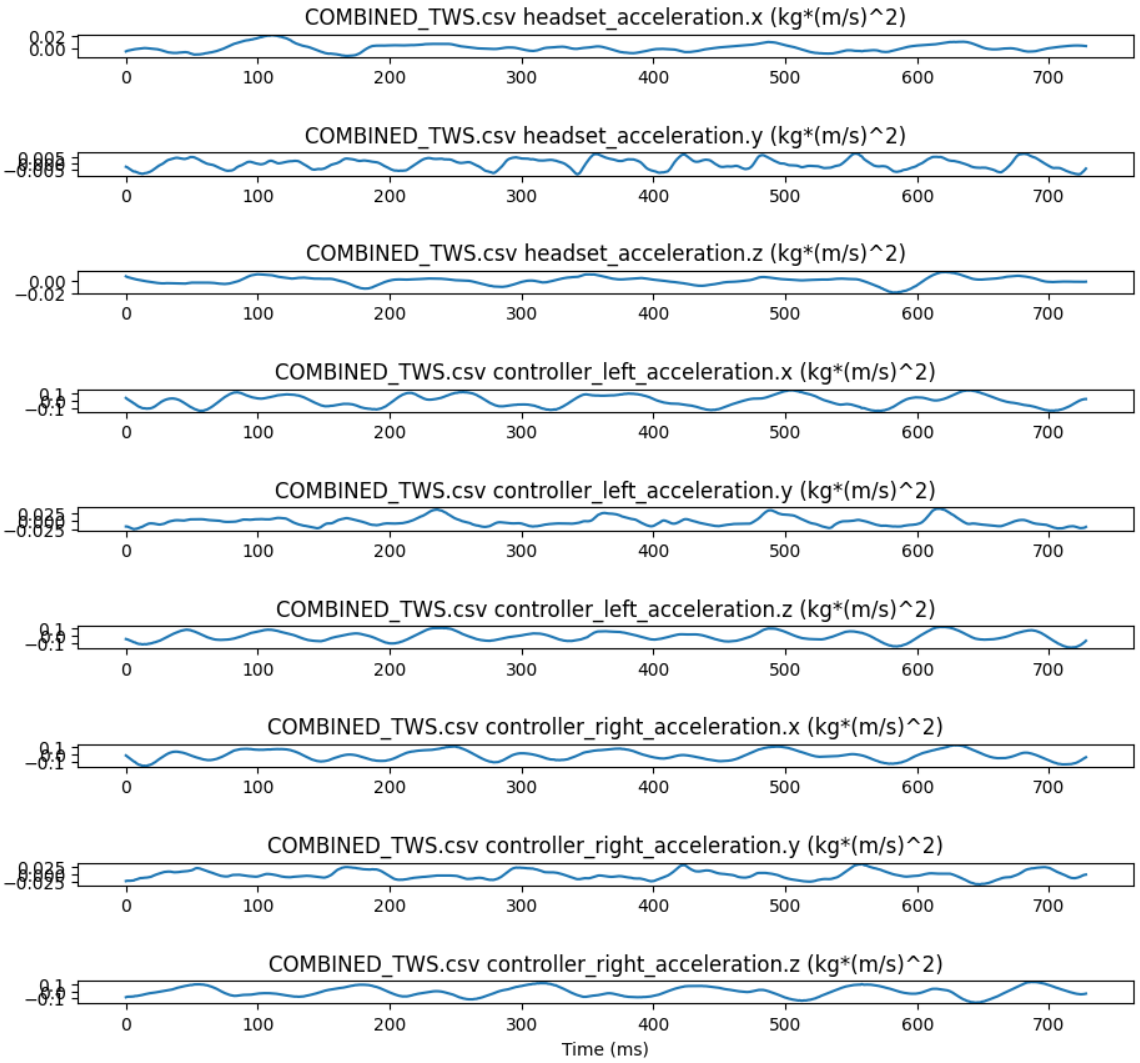

Figure 30: Acceleration plots for twisting.