

1 Supplementary Tables

Table 1: Univariate regression of a specific kinematic parameter to the corresponding error to the gold standard. Velocity ranges from 0.02 m/s to 9.2 m/s , acceleration ranges from $0.0m/s^2$ to 7.28 m/s^2 and the change of direction(COD) ranges from 0 rad/s to $\pi/2\text{ rad/s}$. As indicators we present the R^2 -value, the slope of the linear model with respect to error and parameters, the Pearson correlation score and the R^2 -value of a feed-forward neural network (R^2 NN), to incorporate non-linear measurement of the data fit.

EPTS/Type		error	variable	R ²	slope	pearson	R ² NN
SportsVU/Video	vRMSE	velocity	0.118	0.09	0.344	0.168	
		acceleration	0.233	0.15	0.483	0.273	
		COD	0.004	0.24	0.068	0.010	
	aRMSE	velocity	0.101	0.17	0.317	0.186	
		acceleration	0.298	0.35	0.546	0.304	
		COD	0.029	1.29	0.170	0.043	
GPSports/GPS	vRMSE	velocity	0.180	0.06	0.425	0.226	
		acceleration	0.179	0.07	0.423	0.203	
		COD	0.0	0.04	0.008	0.000	
	aRMSE	velocity	0.033	0.09	0.184	0.052	
		acceleration	0.154	0.25	0.393	0.427	
		COD	0.001	0.70	0.03	0.002	
Immotio/LPM	vRMSE	velocity	0.084	0.04	0.291	0.153	
		acceleration	0.130	0.07	0.361	0.173	
		COD	0.009	0.27	0.030	0.006	
	aRMSE	velocity	0.091	0.10	0.302	0.163	
		acceleration	0.278	0.22	0.527	0.367	
		COD	0.0	-0.08	0.0	0.007	

Table 2: Cluster of 3-dimensional analysis of data. Displayed in mean and covariances of the Gaussian Cluster. While the mean of the Cluster describes the general tendencies, the covariance matrix displays the range of motion recorded in the cluster. Hence, cluster 0 accounts for barely any motion, while cluster 1 and 2 have high variance in speed and acceleration as well as relatively large covariance values for speed and acceleration compared to cluster 0 and 3. Cluster 3 describes the variance in COD for the different players and has comparable low covariance values as cluster 0.

Cluster No.	Mean		Covariance Matrix	
	speed	acceleration	COD	
0	1.62	-0.01	0.01	0.09, 0.01, 0.0 0.01,0.1,0.0 0.0, 0.0, 0.01
1	4.82	-2.68	0.12	2.84, 1.65, -0.12 1.65, 2.3, -0.04 -0.12, -0.04, 0.01
2	4.18	1.93	0.26	3.47,-0.63, 0.12 -0.63, 1.8, -0.19 0.12, -0.19, 0.06
3	0.62	-0.08	0.97	0.12, -0.05, -0.02 -0.05, 0.51, -0.13 -0.02, -0.13, 0.89

Table 3: Velocity and acceleration root mean square error of test systems according to the different clusters.

EPTS	Exercise	Cluster 0		Cluster 1		Cluster 2		Cluster 3	
		vRMSE	aRMSE	vRMSE	aRMSE	vRMSE	aRMSE	vRMSE	aRMSE
SportsVU	SSC	0.08	0.17	0.52	1.05	0.61	1.4	0.19	0.46
	SSG	0.18	0.43	0.36	0.75	0.47	0.97	0.27	0.69
GPSports	SSC	0.06	0.45	0.28	1.15	0.26	1.17	0.10	0.69
	SSG	0.14	0.33	0.24	0.51	0.20	0.53	0.17	0.49
Inmotio	SSC	0.11	0.24	0.36	0.85	0.31	0.91	0.22	0.49
	SSG	0.15	0.40	0.21	0.58	0.23	0.68	0.21	0.54

