Method	Best Train Score	Best Test Score	Best Train Mean Std	Best Test Mean Std	Best Train RMSE	Best Test RMSE	Parameters
Linear Regression (Baseline)	0.911	0.779	11.184	11.777	12.087	18.811	With previous time stamps and derivative terms
Polynomial Regression	0.939	0.806	9.631	12.408	10.036	17.649	Degree = 3
kNN	0.925	0.787	10.525	13.304	11.096	18.490	Without previous times stamps and derivative terms K = 75
Ridge	0.940	0.807	9.533	12.251	9.945	17.541	Degree = 3 Lambda = 0.05
LASSO	0.940	0.803	9.488	12.490	9.894	17.725	Degree = 4 Lambda = 0.01
Decision Tree	0.939	0.778	9.550	13.533	9.947	18.858	Depth = 6
Random Forest	0.985	0.810	4.687	12.279	4.893	17.434	Max_feature = 0.5 Depth = 10
Boosting	0.995	0.810	2.415	12.638	3.052	17.462	AdaBoost Max_depth = 12 Max_feature = 0.5 N_estimators = 100
Artificial Neural Network	0.943	0.808	9.383	11.978	9.690	17.492	Dense layer, 100 nodes, relu Dense layer, 100 nodes, relu Dense layer, 100 nodes, relu Output layer, 3 nodes, linear
Artificial Neural Network	**0.932**	**0.854**	**9.886**	**13.501**	**10.544**	**15.598**	**Dense layer, 100 nodes, tanh Dense layer, 200 nodes, tanh Dropout layer (0.2) Output layer, 3 nodes, linear**
LSTM Neural Network	0.903	0.841	10.454	13.281	12.621	16.268	LSTM layer, 20 nodes Dropout layer (0.2) Dense layer, 50 nodes, tanh Output layer, 3 nodes, linear

Abduction/adduction

Method	Best Train Score	Best Test Score	Best Train Mean Std	Best Test Mean Std	Best Train RMSE	Best Test RMSE	Parameters
Linear Regression (Baseline)	0.810	0.617	13.772	14.639	17.546	23.138	
Polynomial Regression	0.883	0.694	11.419	14.135	13.740	20.669	Degree = 3
kNN	0.934	0.699	8.603	14.919	10.355	20.504	K = 10
Ridge	0.914	0.702	9.905	13.873	11.838	20.442	Degree = 5 Lambda = 1
LASSO	0.879	0.695	11.533	14.124	14.006	20.679	Degree = 3 Lambda = 0.01
Decision Tree	0.929	0.619	8.719	16.388	10.709	23.062	Depth = 8
Random Forest	0.973	0.708	5.257	13.926	6.563	20.204	Max_feature = 0.75 Depth = 10
Boosting	0.991	0.746	2.878	12.994	3.878	18.824	AdaBoost Max_depth = 12 Max_feature = 0.5 N_estimators = 100
Artificial Neural Network	0.899	0.722	10.129	13.231	12.795	19.738	Dense layer, 100 nodes, relu Dense layer, 100 nodes, relu Dense layer, 100 nodes, relu Output layer, 3 nodes, linear
Artificial Neural Network	0.884	0.729	11.171	14.989	13.877	19.432	Dense layer, 100 nodes, tanh Dense layer, 200 nodes, tanh Dropout layer (0.2) Output layer, 3 nodes, linear
LSTM Neural Network	0.815	0.699	12.966	15.196	17.509	20.497	LSTM layer, 20 nodes Dropout layer (0.2) Dense layer, 50 nodes, tanh Output layer, 3 nodes, linear

Horizontal Flexion/Extension

Method	Best Train Score	Best Test Score	Best Train Mean Std	Best Test Mean Std	Best Train RMSE	Best Test RMSE	Parameters
Linear Regression (Baseline)	0.650	0.586	15.648	11.540	24.968	20.614	
Polynomial Regression	0.792	0.711	15.182	11.543	19.222	17.215	Degree = 3
kNN	0.867	0.674	11.748	13.459	15.382	18.376	Without previous times stamps and derivative terms K = 10
Ridge	0.794	0.714	15.066	11.615	19.122	17.166	Degree = 3 Lambda = 0.05
LASSO	0.778	0.695	15.059	12.018	19.838	17.583	Degree = 3 Lambda = 0.01
Decision Tree	0.756	0.604	14.680	13.211	20.856	20.253	Without previous times stamps and derivative terms Depth = 5
Random Forest	0.949	0.726	7.082	11.782	9.524	16.780	Max_feature = 0.5 Depth = 10
Boosting	0.984	0.742	3.267	11.306	5.347	16.281	AdaBoost Max_depth = 12 Max_feature = 0.5 N_estimators = 100
Artificial Neural Network	0.806	0.746	11.606	11.186	18.579	16.052	Dense layer, 100 nodes, relu Dense layer, 100 nodes, relu Dense layer, 100 nodes, relu Output layer, 3 nodes, linear
Artificial Neural Network	0.844	0.746	12.081	14.468	16.589	19.360	Dense layer, 100 nodes, tanh Dense layer, 200 nodes, tanh Dropout layer (0.2) Output layer, 3 nodes, linear
LSTM Neural Network	0.665	0.644	15.176	15.283	24.316	22.904	LSTM layer, 20 nodes Dropout layer (0.2) Dense layer, 50 nodes, tanh Output layer, 3 nodes, linear

Internal/External Rotation