Supplementary material

Table 1. Mean (standard-deviation) of each gait speed across subjects. The Froude number, *v*,* was calculated based on the comfortable speed (*v)*, gravity *(g*), and leg length (l_0*).*

$$v^* = v/\sqrt{g l_0}$$

Gait speed	m/s mean (SD)	Froude mean (SD)
V1	0.50 (0.06)	0.17 (0.02)
V2	0.69 (0.08)	0.23 (0.03)
V3	0.87 (0.11)	0.30 (0.03)
V4	1.06 (0.13)	0.36 (0.04)
V5	1.24 (0.15)	0.42 (0.05)
V6	1.43 (0.18)	0.49 (0.06)
V7	1.62 (0.20)	0.55 (0.06)
V8	1.81 (0.22)	0.61 (0.07)

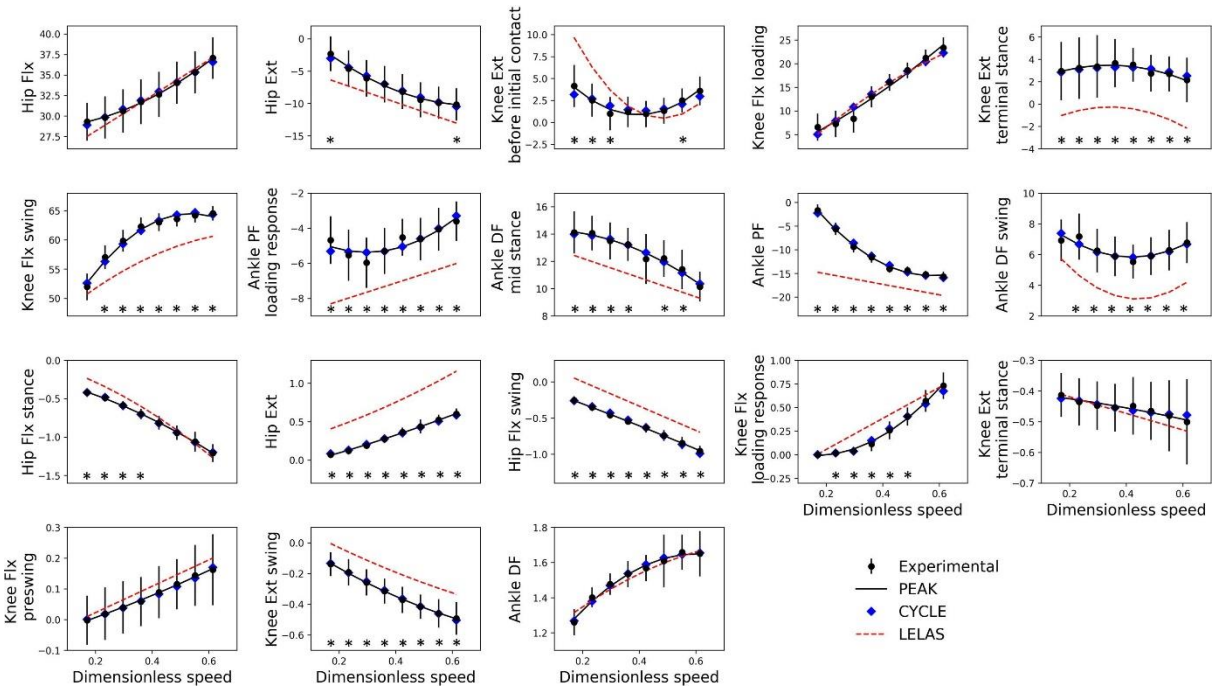

Figure 1. Minimum and maximum values averaged across subjects of the experimental (•) hip, knee, and ankle joint angles (in º, first two rows) and joint moments (in Nm/kg, third and fourth rows) versus the dimensionless gait speed. The vertical bars indicate the 95% CI for each of these values. For each variable, the curves represent the quadratic regression to these values using the PEAK method (solid line) and the LELAS equations (dashed line). The corresponding values predicted by the CYCLE method are also shown (◆). Statistically significant differences between experimental true values and the values predicted with LELAS equations are marked with an asterisk.

Table 2. Procedure for the RMSE calculation.

RMSE	RMSEall
1. Obtain the maximum and minimum values of the mean curve of each subject and speed; 2. Calculate the RMSE between the experimental (true values) and the PEAK, CYCLE or LELAS for each subject and speed; $RMSE(i,s) = \sqrt{\frac{\Sigma_{i=1}^{n}\left(T_{i,s} - P_{i,s}\right)^2}{n}}$ where *i and s are each subject and gait speed, respectively*, *T* is the true value, *P* is the predicted value (PEAK, CYCLE or LELAS) and *n* is the total number of subjects.	1. Obtain the maximum and minimum values of the mean curve across subjects for each speed; 2. Calculate the RMSE between the experimental (true values) and the PEAK, CYCLE or LELAS for each speed. $RMSEall(s) = \sqrt{\frac{\Sigma_{s=1}^{n}(T_s - P_s)^2}{n}}$ where *s* represents each gait speed, *T* is the true value, *P* is the predicted value (PEAK, CYCLE or LELAS) and *n* is the total number of gait speeds.

Table 3. Coefficients [β_0, β_1, β_2] for the quadratic regressions ($y=\beta_0 v^2+\beta_1 v+\beta_2$) to the experimental minimum and maximum values of the hip, knee, and ankle joint angles and moments as function of gait speed (in the dimensionless unit) using the PEAK prediction method (see Figure 1). Also shown, the χ^2_{red} and R^2_{adj} goodness-of-fit metrics and the RMSE between the experimental values and the predicted values using the PEAK and CYCLE methods and LELAS equations.

Variable	PEAK coefficients [β_0, β_1, β_2]	χ^2_{red}	R^2_{adj}	PEAK RMSE	CYCLE RMSE	LELAS RMSE
Joint angles (°)						
Hip Flexion	[20.581, 1.290, 28.448]	0.010	0.999	0.078	0.279	0.769
Hip Extension	[30.497, -41.238, 3.620]	0.058	0.992	0.191	0.344	2.583
Knee Extension before initial contact	[61.001, -48.500, 10,491]	0.076	0.950	0.217	0.571	2.688
Knee Flexion loading response	[17.934, 27.325, 0.421]	1.180	0.972	0.859	1.168	1.249
Knee Extension terminal stance	[-18.598, 12.698, 1.310]	0.037	0.853	0.151	0.265	3.914
Knee Flexion swing	[-88.269, 94.703, 39.104]	0.472	0.975	0.543	0.564	4.550
Ankle Plantarflexion loading response	[19.603, -11,685, -3.640]	0.178	0.708	0.334	0.385	2.436
Ankle Dorsiflexion mid stance	[-13.150, 1.695, 14.246]	0.076	0.961	0.218	0.243	1.792
Ankle Plantarflexion	[84.504, -96.985, 12.309]	0.141	0.995	0.296	0.475	7.094
Ankle Dorsiflexion swing	[23.294, -19.571, 9.934]	0.102	0.688	0.252	0.265	2.443
Joint moments (Nm/kg)						
Hip Flexion stance	[-1.176, -0.865, -0.233]	0.000	0.999	0.007	0.006	0.106
Hip Extension	[0.381, 0.927, -0.108]	0.000	0.997	0.008	0.012	0.440
Hip Flexion swing	[-0.207, -1.394, -0.016]	0.000	0.999	0.005	0.019	0.278
Knee Flexion loading response	[3.661, -1.166, 0.083]	0.000	0.994	0.017	0.027	0.126
Knee Extension terminal stance	[-0.087, -0.097, -0.403]	0.000	0.894	0.007	0.011	0.023
Knee Flexion preswing	[0.114, 0.291, -0.056]	0.000	0.996	0.003	0.006	0.028
Knee Extension swing	[0.563, -1,255, 0.063]	0.000	0.999	0.004	0.006	0.152
Ankle Dorsiflexion	[-1.981, 2.388, 0.930]	0.000	0.981	0.015	0.014	0.028