Table 1. Formulas: Spatio-Temporal and Frequency

Abbreviation	Description	Formulas
Spatio-temporal features		
Range	Range: $[m/s^2, rad/s, m/s^3]$ Features: 1, 3, 5, 7, 9, 11	$\max x - \min x$
RMS	Root mean square: $[m/s^2, rad/s, m/s^3]$ Features: 2, 4, 6, 8, 10, 12	$\sqrt{\frac{\Sigma x_t^2}{N}}$
Jerk	Time derivative of acceleration $[m/s^3]$	$\frac{da}{dt}$
JerkComb	Time derivative of acceleration AP and ML $[mm/s^5]$	$\frac{1}{2}\int\left(\left(\frac{da_{AP}}{dt}^2\right)+\left(\frac{da_{ML}}{dt}^2\right)\right)$
MMag	Mean acceleration magnitude $[mm/s^4]$ Feature: 13	$\frac{\Sigma\sqrt{a_{AP}^2 + a_{ML}^2}}{N}$
Mean Frequency	Rounds required to cover full acceleration trajectory $[Hz]$ Feature: 14	$\frac{(2\pi * \text{Dist} * N)}{\text{Path}}$
Dist	Mean distance of acceleration centre $[mm/s^4]$ Feature: 15	$\frac{\Sigma(\lvert a_{AP} - \bar{a}_{AP}\rvert + \lvert a_{ML} - \bar{a}_{ML}\rvert)}{N}$
Disp	Displacement of acceleration $[mm/s^4]$ Feature: 16	$\Sigma_{t=0}^{N-1}(\lvert a_{AP_t} - a_{AP_{t+1}}\rvert + \lvert a_{ML_t} - a_{ML_{t+1}}\rvert)$
Mean velocity	Mean velocity $[mm/s^2]$ Feature: 17	$\frac{\Sigma\sqrt{(\int a_{AP})^2 + (\int a_{ML})^2}}{N}$
Path	Total length of trajectory $[mm/s^4]$ Feature: 18	$\Sigma\sqrt{(a_{AP})^2 + (a_{ML})^2}$
Area	Sway area computed as area spanned from acceleration per unit of time $[m^2/s^5]$ Feature: 19	$\frac{\Sigma\text{JerkComb}}{N}$
Frequency features		
FFT	Fast fourier transform	$\Sigma_{t=0}^{N-1} a_t e^{-i2\pi * \frac{tk}{N}} \quad k = 0, ..., N-1$
PWR	Total Power Features: 24,28	$\Sigma_k \text{FFT}$
F50	Median Frequency $[Hz]$ Features: 22, 26	$f0.5 : \Sigma_k^{f0.5}\text{FFT}$
F95	95% power frequency $[Hz]$ Features: 23, 27	$f0.95 : \Sigma_k^{f0.95}\text{FFT}$
CF	Centroidal Frequency $[Hz]$ Features: 25, 29	$\Sigma_k(\frac{FFT}{\Sigma FFT} * k)$

Abbreviations: x = Input; t = 1 observation; N = Total number of observations; a = Acceleration; AP = Anterior posterior; ML = Mediolateral;
Sources: [1]
The algorithm to process the data and calculate balance features is available on GitHub:https://github.com/RichardFel/Reliability-of-Balance (accessed on 10-07-2021).

Table 2. Formulas: Complexity and Statistics

Abbreviation	Description	Formulas and Function Input
Spatio-temporal features		
Circle area	Circle that encapsulates 95% of the data points. $[mm/s^4]$ (Feature: 20)	Initial circle size = .001; Increase .001; Percentage = 95
Ellipse area	Ellipse that encapsulates 90% of the data points. $[mm/s^4]$ Feature: 21	Initial ellipse size = .001, .002; Increase = .001, .002; Angle = 0 - 180; Percentage = 90
Complexity features		
Approximate entropy	Technique to quantify the regularity and unpredictability of acceleration Features: 31,34	Embedding dimension = 2; Tolerance = 0.2 * SD.
Sample entropy	Technique to quantify the regularity and unpredictability of acceleration and gyroscope Features: 32,35	Embedding dimension = 2; Tolerance = 0.2 * SD.
Lyapunov exponent	Maximum finite time lyapunov exponent following Rosenstein's algorithm	Statespace: (delay = 10, dimensions= 5). Rosenstein's algorithm: period = 1; windowsize = .5s; nearest neighbours = 5.
Statistics		
ICC	Two-way random effects, absolute agreement, single rater/measurement (ICC 2.1)	$\frac{MS_R - MS_E}{MS_R + (k-1)\,MS_E + \frac{k}{n} MS_C - MS_E}$
SEM	Standard error of measurement	SD $\sqrt{1 - ICC}$
MDC	Minimal detectable change	SEM $* 1.96 * \sqrt{2}$
rMDC	Minimal detectable expressed in standard deviations	$\frac{\text{MDC}}{(SD_{test} + SD_{retest}) * 0.5}$

Abbreviations: SD = Standard deviation; MS_R = mean square for rows; MS_E = mean square for error; MS_C = mean square for columns; n = number of participants; k = number of raters/measurements;
Sources: [2, 3, 4, 5]
The algorithm to process the data and calculate balance features is available on GitHub:https://github.com/RichardFel/Reliability-of-Balance (accessed on 10-07-2021).