

Smartphone-Based Body Location-Independent Functional Mobility Analysis in Patients with Parkinson's Disease: A Step towards Precise Medicine

Diogo Vila-Viçosa ¹, Mariana Leitão ², Raquel Bouça-Machado ^{2,3}, Filipa Pona-Ferreira ², Sara Alberto ¹,
Joaquim J. Ferreira ^{2,3,4} and Ricardo Matias ^{1,5,*}

¹ Kinetikos, 3030-199 Coimbra, Portugal; dvicosa@kinetikoshealth.com (D.V.-V.); salberto@kinetikoshealth.com (S.A.)

² CNS—Campus Neurológico Sénior, 2560-280 , Portugal; marianaleitao.ft@gmail.com (M.L.); raquelbouca@cns-campus.com (R.B.-M.); filipaponaferreira@campus.ul.pt (F.P.-F.); joaquimjferreira@cns-campus.com (J.J.F.)

³ Instituto de Medicina Molecular João Lobo Antunes, 1649-028 Lisbon, Portugal

⁴ Laboratory of Clinical Pharmacology and Therapeutics, Faculdade de Medicina, Universidade de Lisboa, 1649-028 Lisbon, Portugal

⁵ Physics Department & Institute of Biophysics and Torres Vedras Biomedical Engineering (IBEB), Faculty of Sciences, University of Lisbon, Campo Grande, 1749-016 Lisbon, Portugal

* Correspondence: rmatias@kinetikoshealth.com

Supplementary Materials



Figure S1: Global aerial view of the garden where the trial was performed.



Figure S2: Representative smartphone locations: 1, 2 and 3 correspond, respectively, to Pants, Belt and Hand, which all 20 subjects carried. 4 and 5 correspond to Pocket and Bag, carried by 10 subjects each.

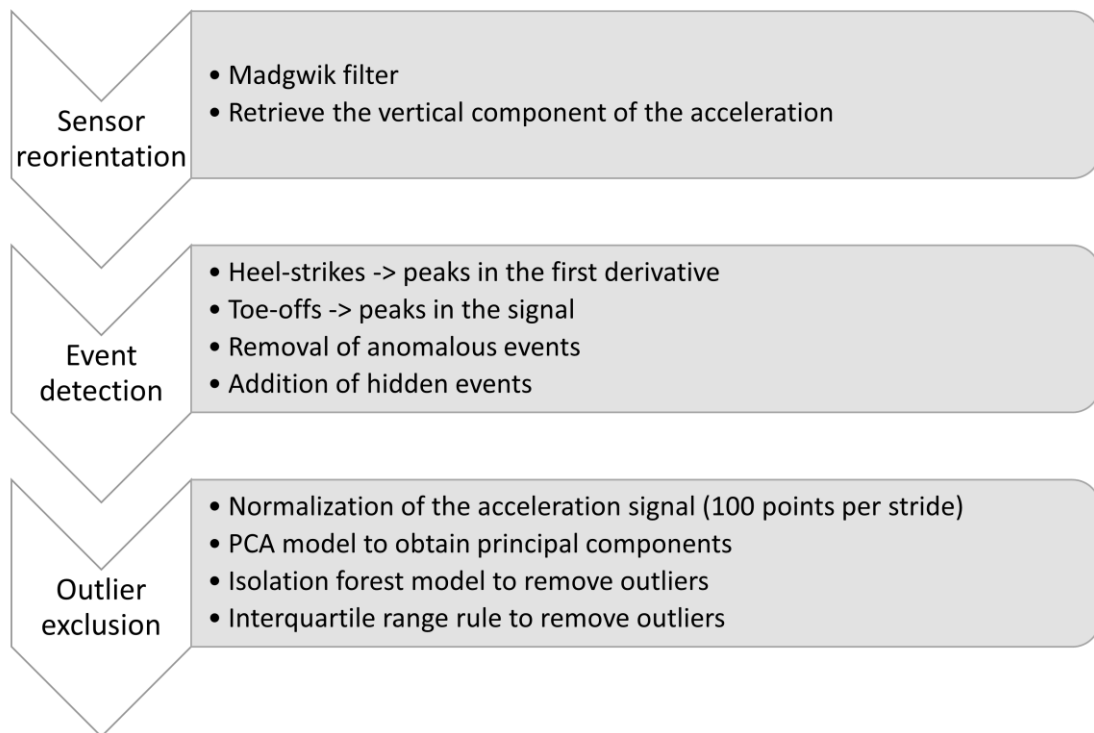


Figure S3: Pipeline of data processing comprising three main steps: sensor orientation, event detection and outlier exclusion.

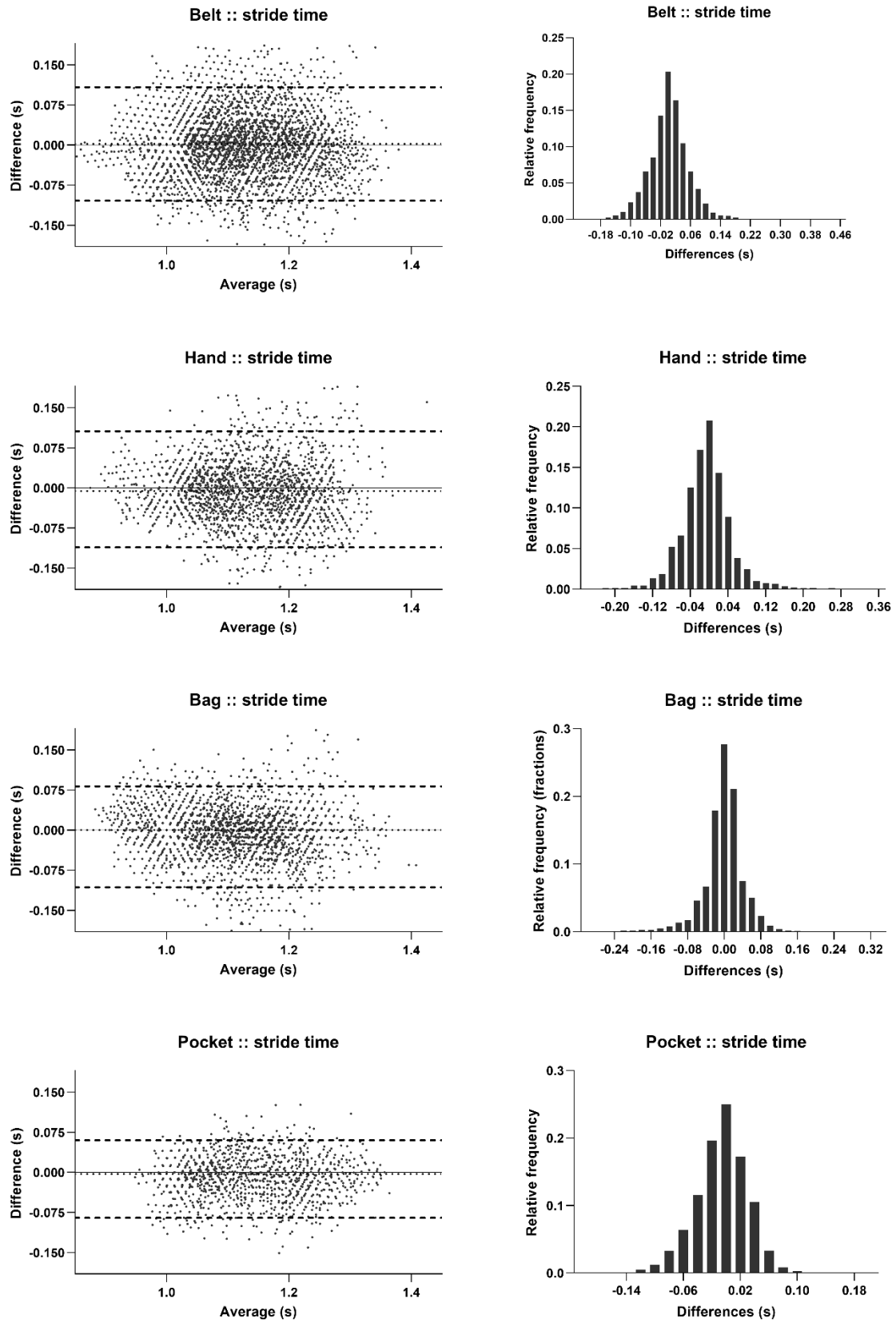


Figure S4: Bland-Altman comparison of the Pants stride time with those for all other locations. Dashed lines represent bias (median) and LoA (quantiles 2.5% and 97.5%).

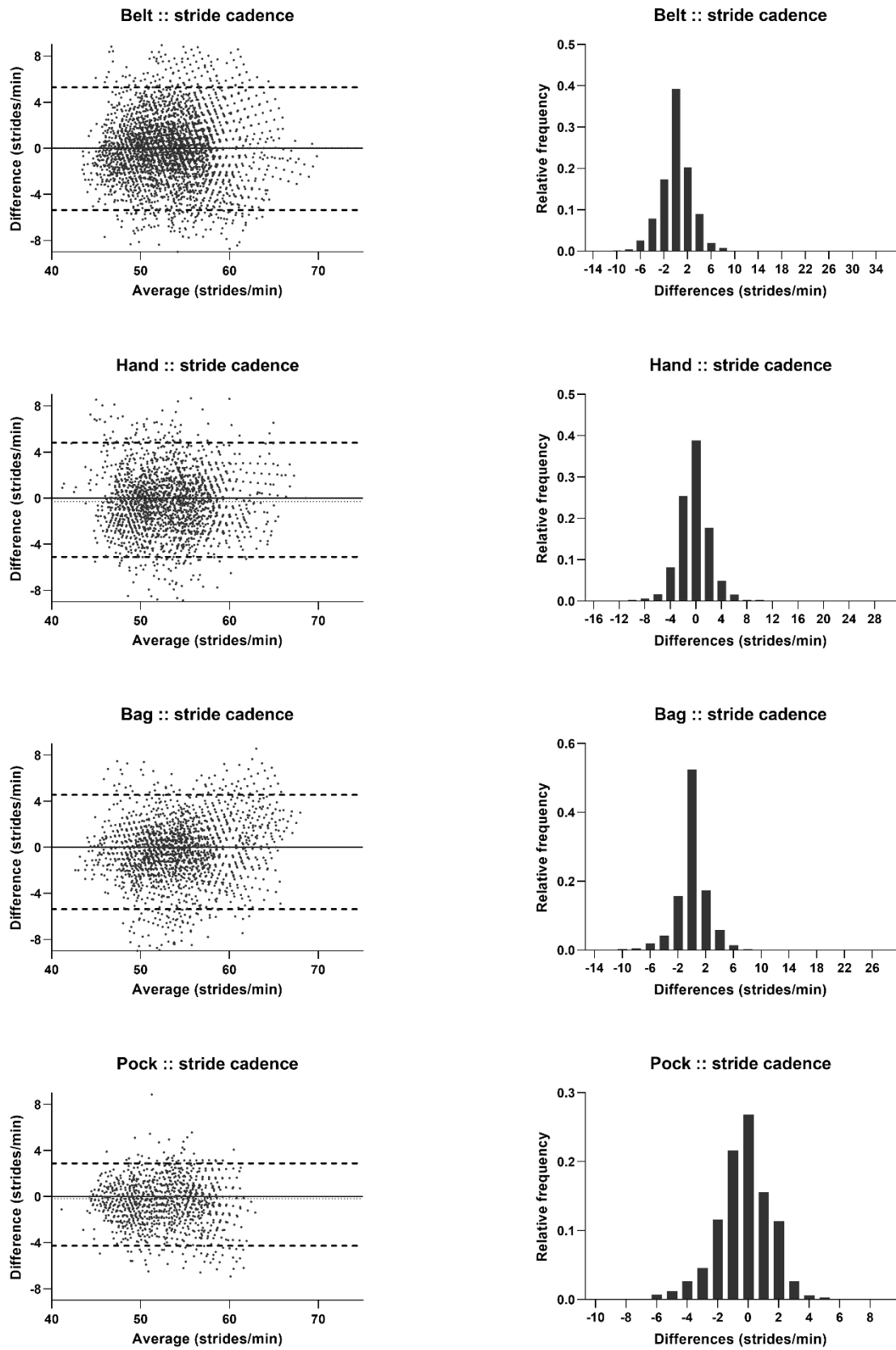


Figure S5: Bland-Altman comparison of the Pants stride cadence with those for all other locations. Dashed lines represent bias (median) and LoA (quantiles 2.5% and 97.5%).

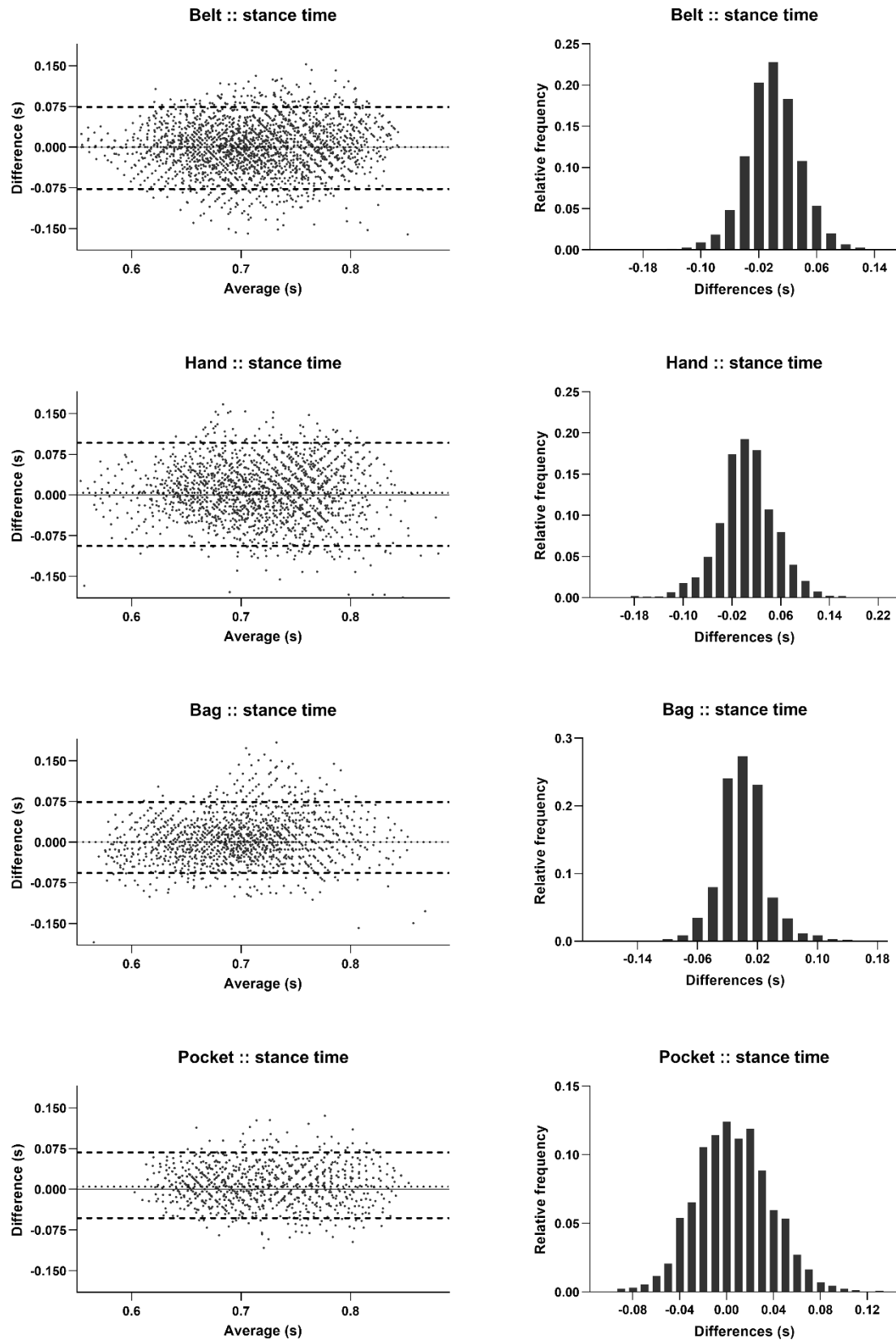


Figure S6: Bland-Altman comparison of the Pants stance time with those for other locations. Dashed lines represent bias (median) and LoA (quantiles 2.5% and 97.5%).

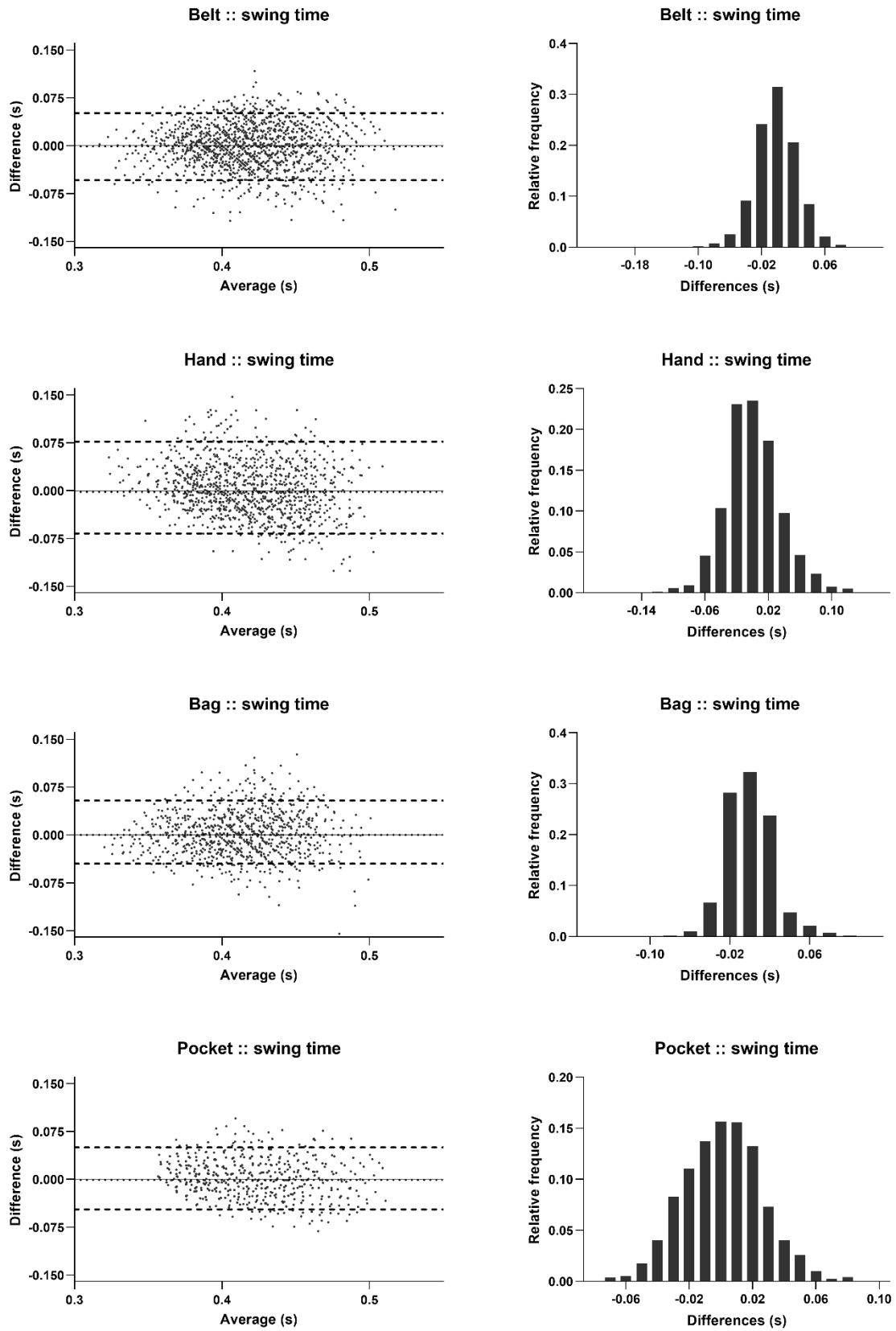


Figure S7: Bland-Altman comparison of the Pants swing time with those for all other locations. Dashed lines represent bias (median) and LoA (quantiles 2.5% and 97.5%).

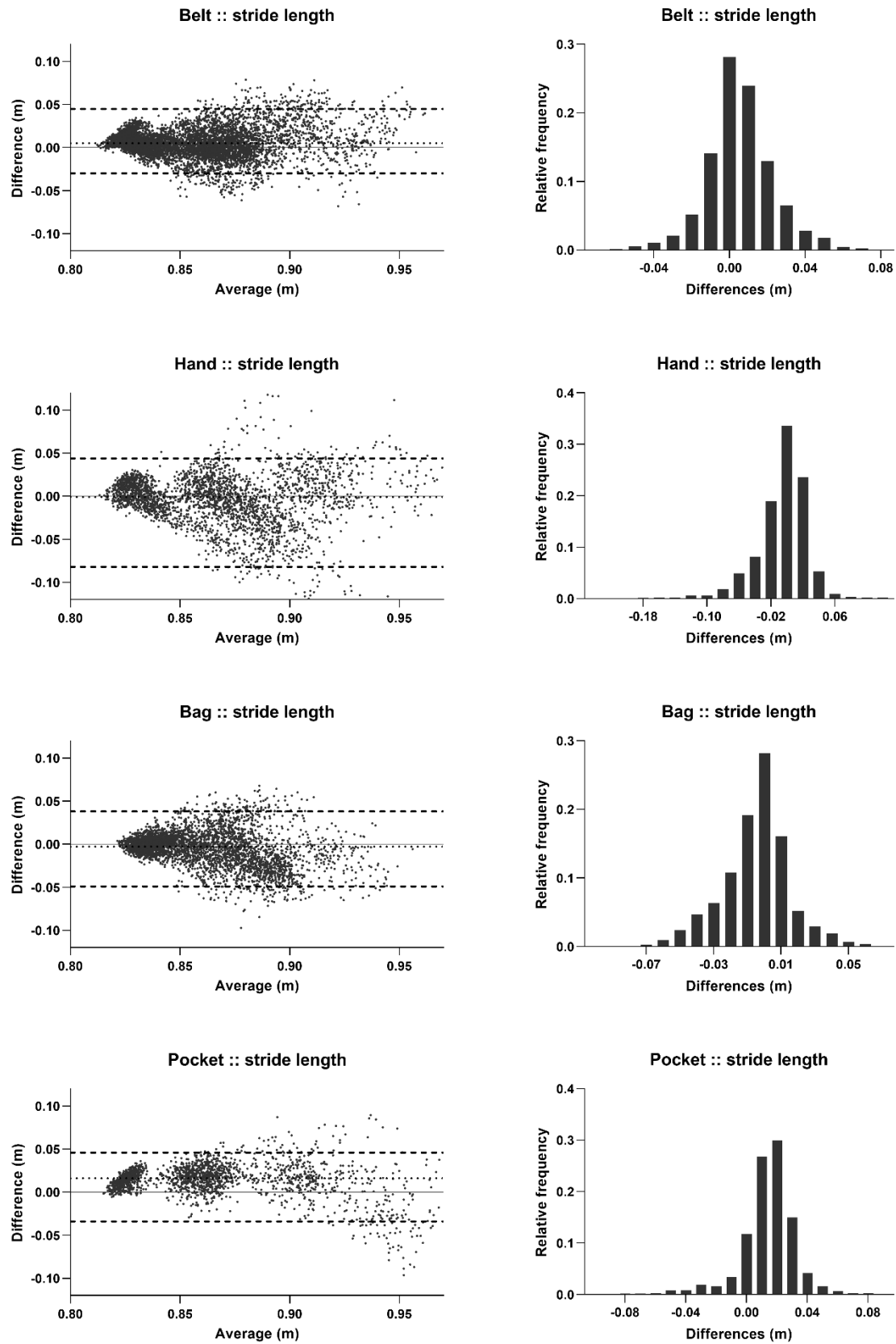


Figure S8: Bland-Altman comparison of the Pants stride length with those for all other locations. Dashed lines represent bias (median) and LoA (quantiles 2.5% and 97.5%).

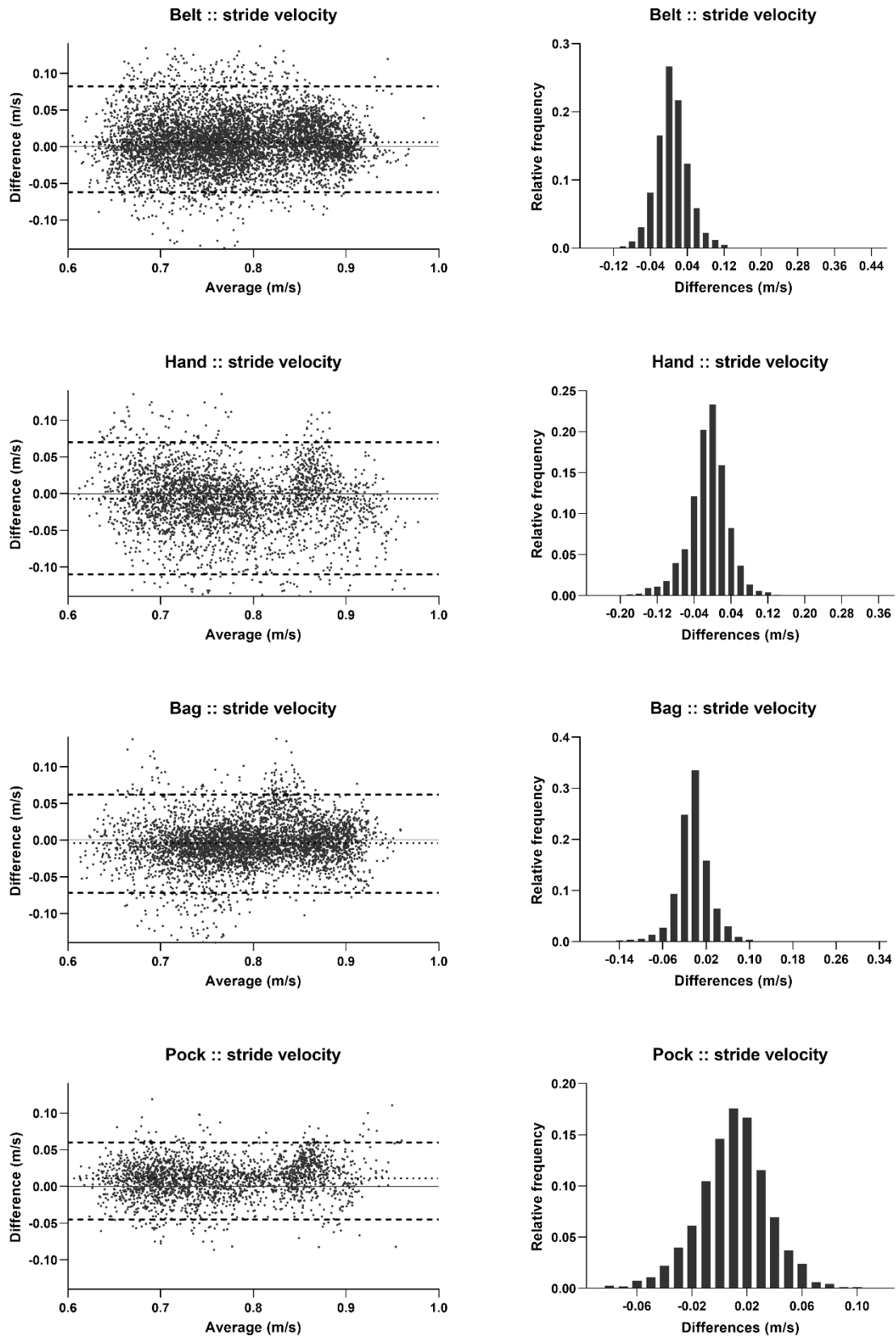


Figure S9: Bland-Altman comparison of the Pants stride velocity with those for all other locations. Dashed lines represent bias (median) and LoA (quantiles 2.5% and 97.5%).

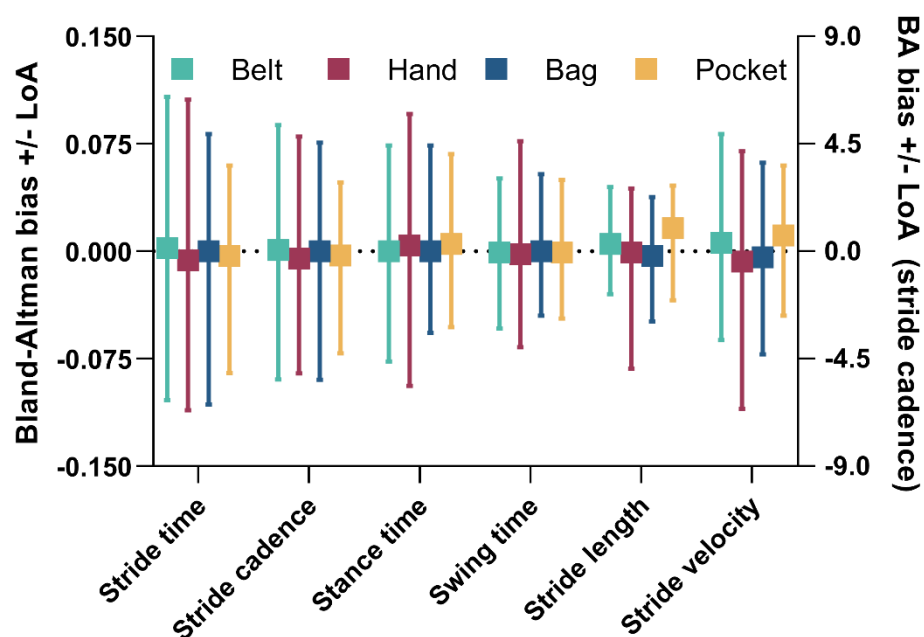


Figure S10: Agreement between gait parameters for Pants and for the other smartphone locations. Bias and LoA from the Bland-Altman analysis are shown.