

Kinematic Model Verification

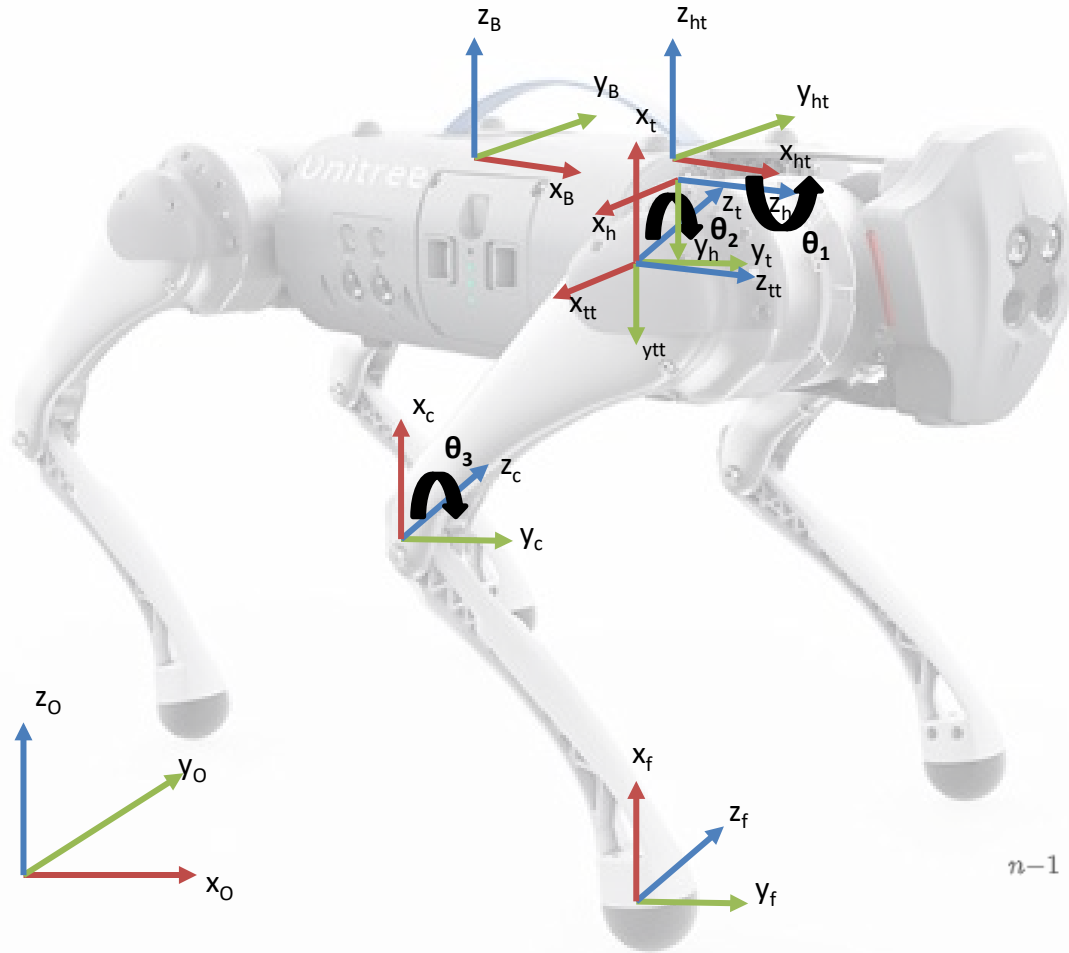
Platform: Quadruiped Unitree Go1

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Unitree Go1 Quadrupe Kinematic Model



Front Right Leg

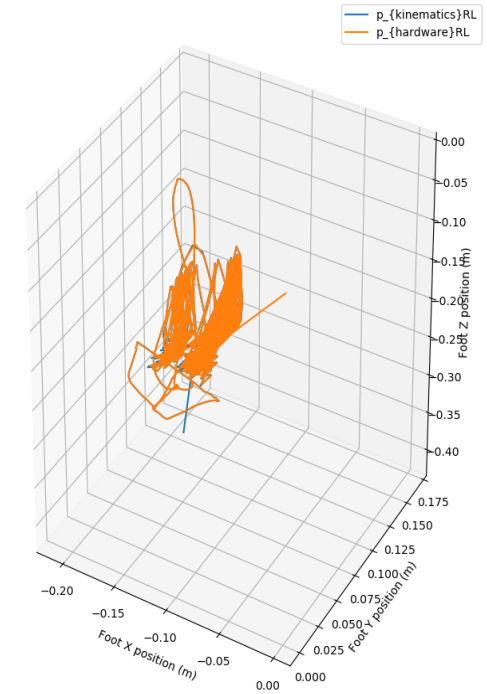
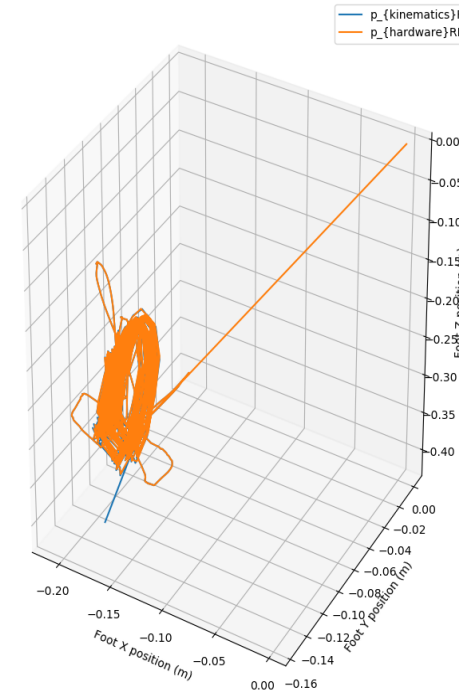
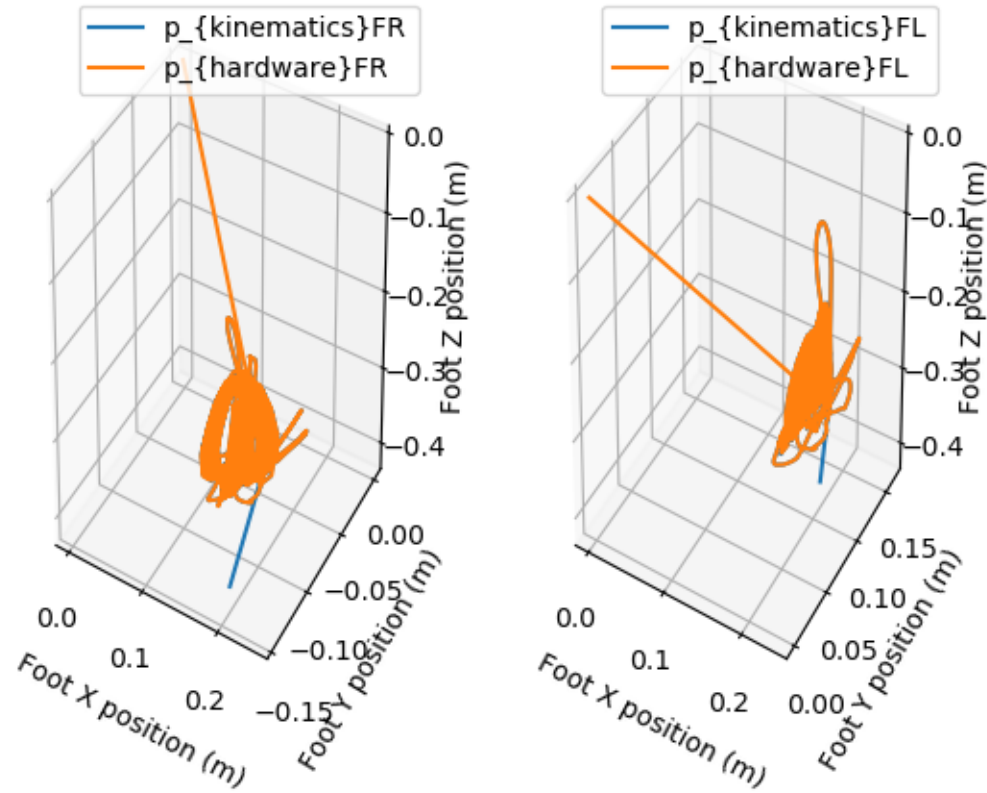
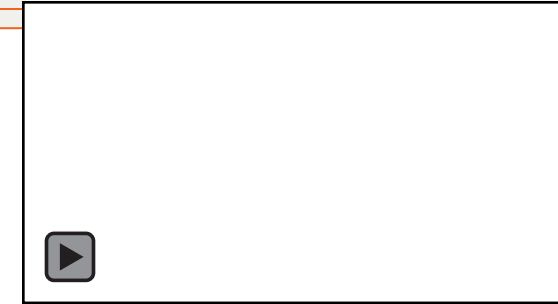
$$T_b^O = \begin{bmatrix} R_{zyx} & pb^T \\ 0 & 1 \end{bmatrix}$$

No	Θ_n	α_n	r_n	d_n
1 (B->ht)	0	0	0.1881	0
2 (ht->h)	$-\pi/2$	$-\pi/2$	0.04675	0
3 (h->tt)	0	0	0.08	0
4 (tt->t)	$-\pi/2$	$\pi/2$	0	0
5 (t->c)	0	0	0.213	0
6 (t->f)	0	0	0.213	0

$${}^{n-1}T_n = \left[\begin{array}{ccc|c} \cos \theta_n & -\sin \theta_n \cos \alpha_n & \sin \theta_n \sin \alpha_n & r_n \cos \theta_n \\ \sin \theta_n & \cos \theta_n \cos \alpha_n & -\cos \theta_n \sin \alpha_n & r_n \sin \theta_n \\ 0 & \sin \alpha_n & \cos \alpha_n & d_n \\ \hline 0 & 0 & 0 & 1 \end{array} \right] = \left[\begin{array}{c|c} R & T \\ \hline 0 & 1 \end{array} \right]$$

Unitree Go1 Quadruped Kinematic Model Verification with Hardware Data

Codebase: https://github.com/ARMLabCUICAR/Quadruped_Locomotion_Model_Based_DRL.git



Parameter Foot Position MSE	Front Right (FR)	Front Left (FL)	Rear Right (RR)	Rear Left (RL)
X	2.3×10^{-5}	2.3×10^{-5}	2.3×10^{-5}	2.3×10^{-5}
Y	1.05×10^{-5}	1.05×10^{-5}	1.05×10^{-5}	1.05×10^{-5}
Z	10^{-4}	10^{-4}	10^{-4}	10^{-4}