

TERRA: Terrain-Aware Reconstruction, Retargeting and Control for Musculoskeletal Locomotion

Original summary — NOT the original paper or model card.

primary preprint identified · 2026-09-29 [22]

Authors/source: Simos, Merkourios, Li, Chengkun, Ziliotto, Bianca, Mathis, Alexander

Coverage: Video topic

What the source reports

Reconstructs task-relevant terrain from motion alone, retargets it to a musculoskeletal body and trains one muscle-actuated simulation policy using a 9.4-hour training split of an 11.3-hour library from five datasets. [22]

Managing expectations

Evaluation is in simulation and on supported terrain families. Task-relevant support geometry from motion is not complete reconstruction of unseen scenery. Dynamic primitive geometry, online retargeting and moving surfaces remain open challenges (paper conclusion). Physiological comparison shows visible EMG timing/shape mismatches, not complete equivalence to measured human movement. Not best on every terrain: TERRA+Voronoi performed better on stairs in reported held-out tracking. [22]

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