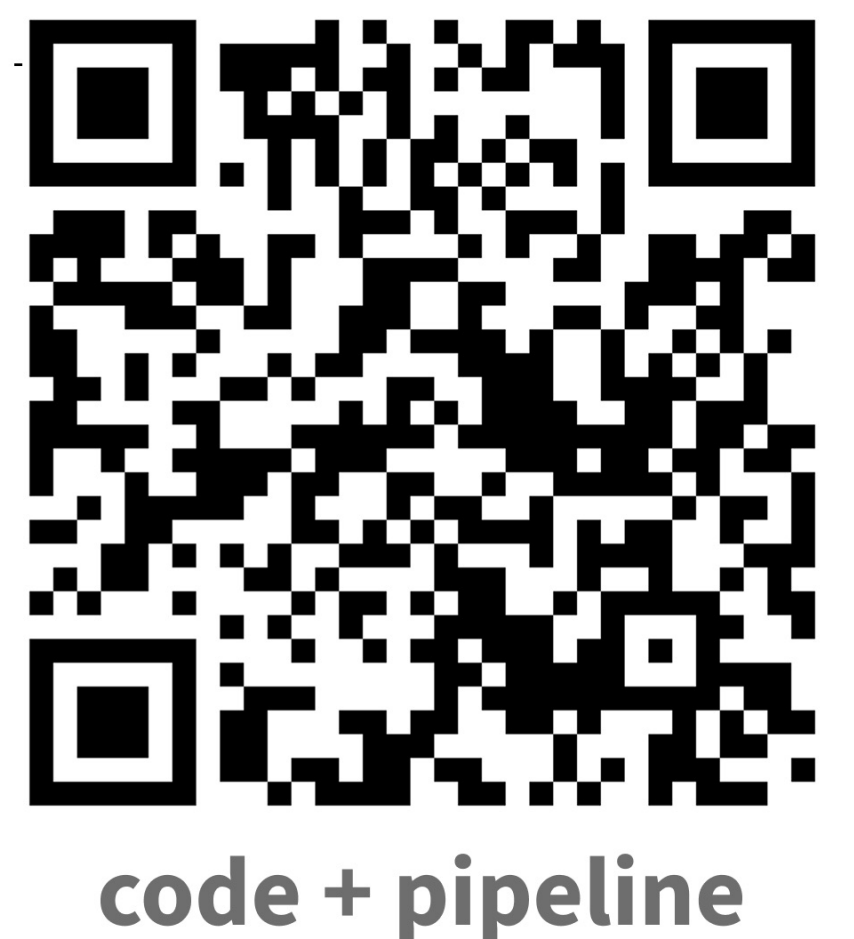


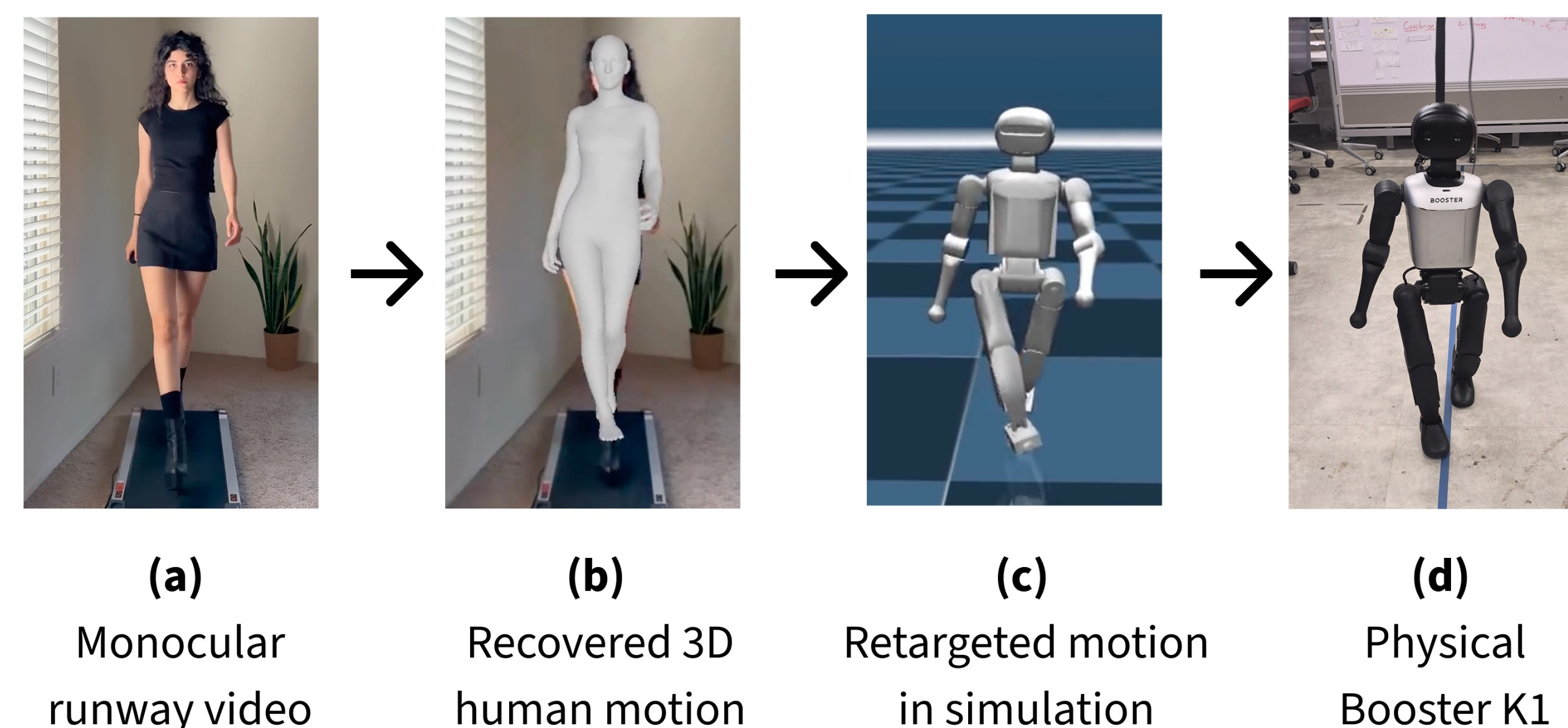
Learning Expressive Humanoid Locomotion from Monocular Runway Videos for Robot Fashion Shows

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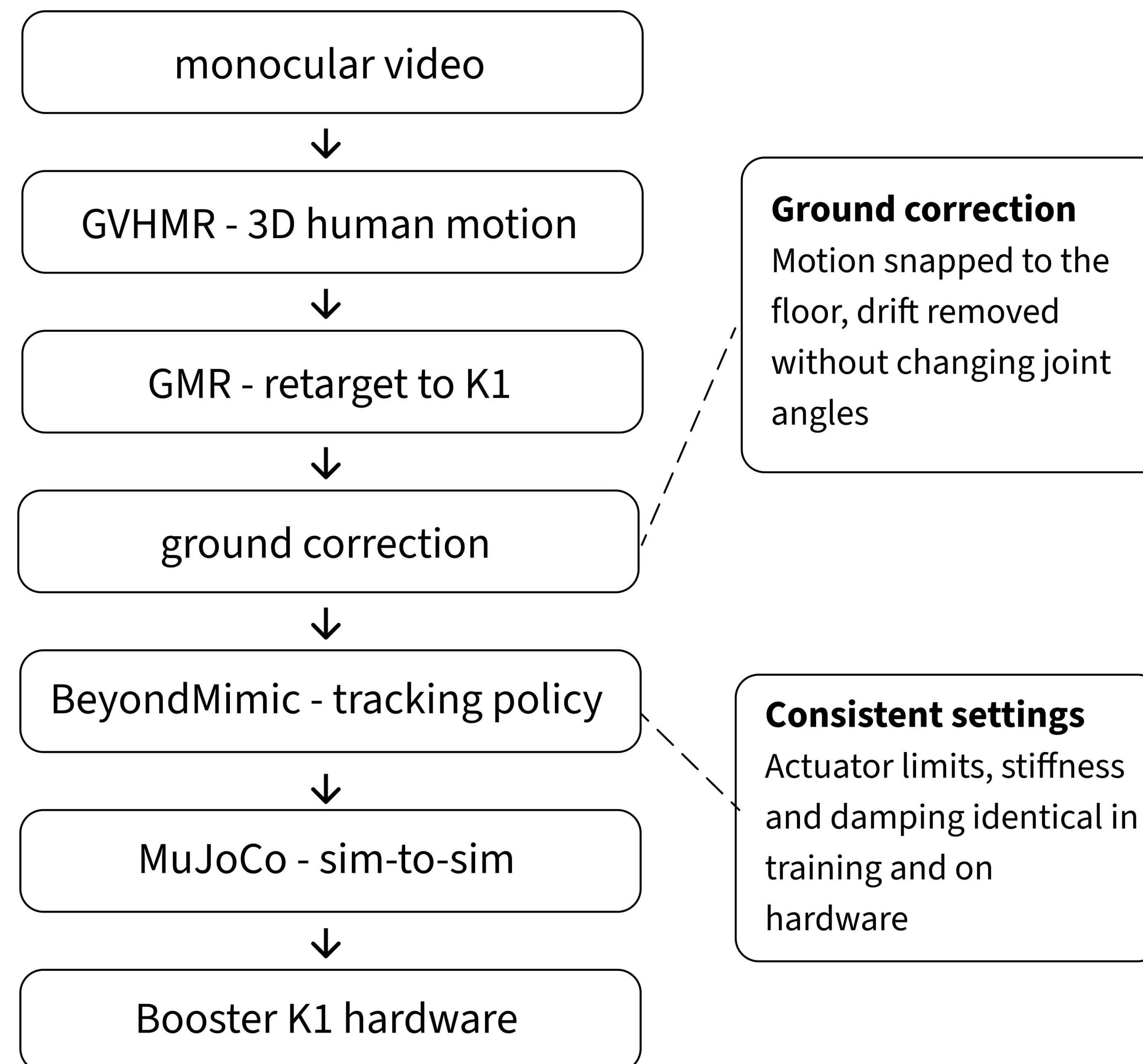
Why runway gait?

Humanoid robots now walk fashion show runways, but runway walking is more than locomotion: posture, stride, and foot placement present the garment and convey a distinct style. These robots run policies tuned for balance and velocity tracking, so they cross the runway but do not truly perform it. We learn the catwalk gait directly from a single monocular video and deploy it on a physical humanoid robot.



Prior work on fashion-inspired gait stayed in simulation or in planar models.
We deploy on physical hardware

From video to a running policy



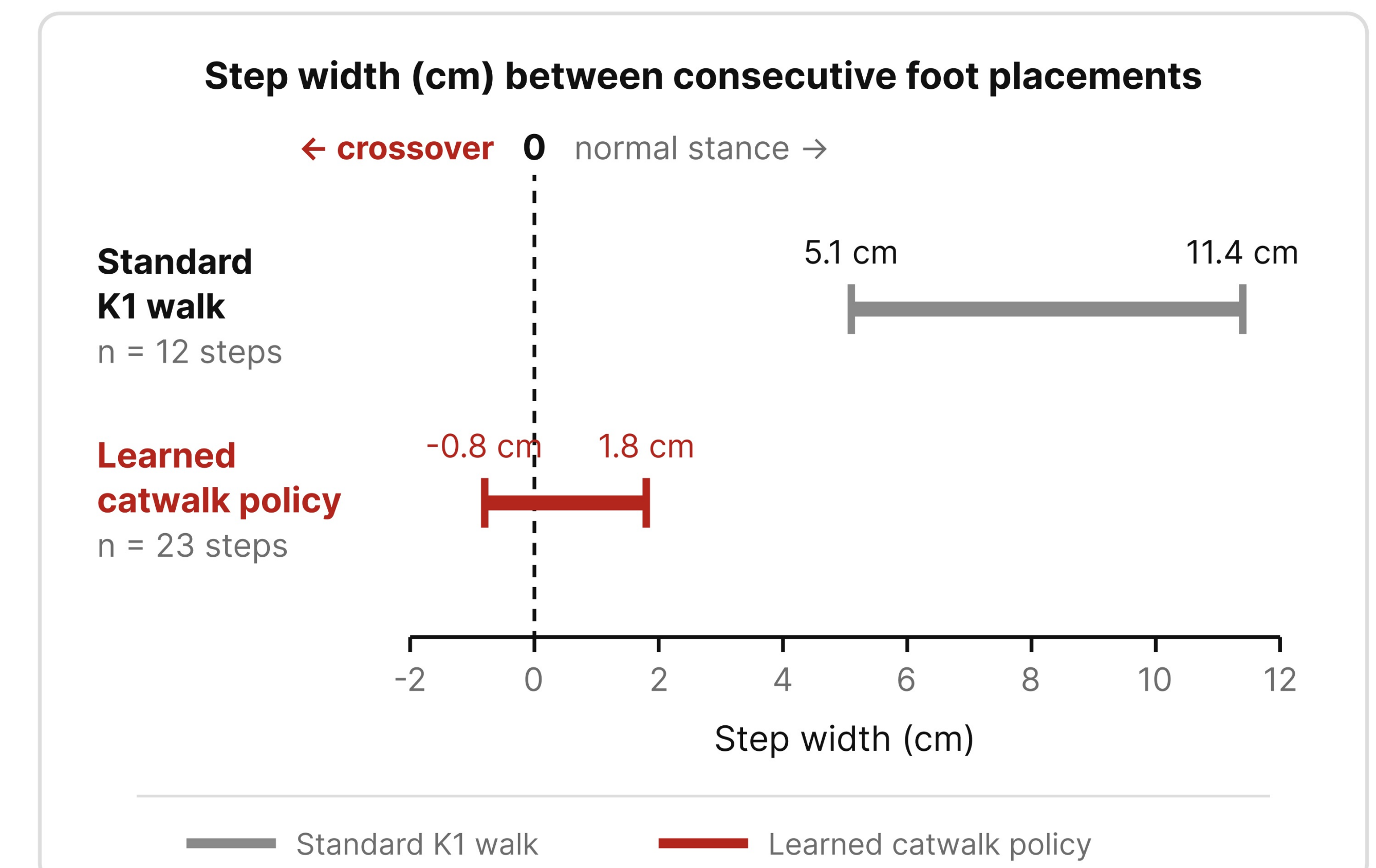
Why step width?

Kobayashi et al. (2024) found leg crossing to be what separates runway walking from ordinary gait, and step width measures it directly

Results in the real world

20/20

physical trials completed without a fall ≈ 23 steps each



Standard walk 5.1 – 11.4 cm
Catwalk policy -0.8 – 1.8 cm (crossover steps present)



Watch the robot walk
 Loop of one full runway traversal

Future work

- Velocity-tracking policy that preserves catwalk style
- Style-aware quantitative metrics beyond step width
- Expert evaluation and user studies of the walking styles
- Curated dataset of runway motions and walking styles
- Exploring how shoe geometry and garments affect gait

References

- ✓ [1] Y. Kobayashi et al., "Classification of fashion models' walking styles using publicly available data, pose detection technology, and multivariate analysis," Sensors, 2024.
- ✓ [2] T. E. Truong et al., "BeyondMimic: From motion tracking to versatile humanoid control via guided diffusion," arXiv:2508.08241, 2025.
- ✓ [3] U. Huzaifa et al., "Toward an expressive bipedal robot: Variable gait synthesis and validation in a planar model," Int. J. Soc. Robot., 2020.

