**Supplement for:** From Adaptive Locomotion to Predictive Action Selection – Cognitive Control for a Six-Legged Walker

**Authors**

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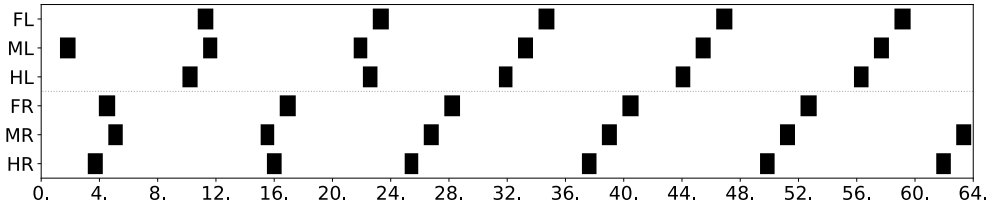
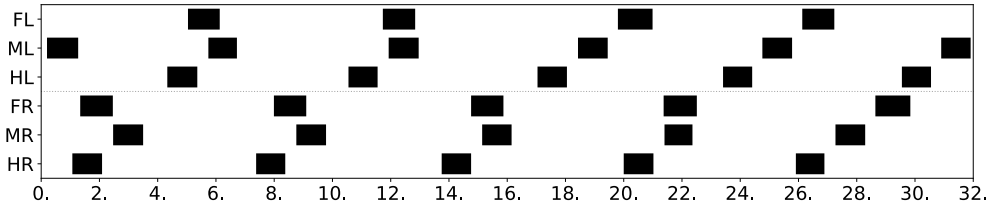
# Results A: Stable emergent locomotion

Fig. S1 shows results from dynamical simulations of the Hector robot. Different velocities are applied (this affects only the stance velocity, swing movements do not depend on walking velocity). Different walking patterns emerge as can be observed in locomotion of insects (see Video S2 for example simulation runs). To illustrate a more complex case, Fig. S2 shows an example of curve walking performed in an earlier simulation (Schilling et al 2013b), which involves intersegmental drives between the different body segments not realized on the current robot platform and its simulator.

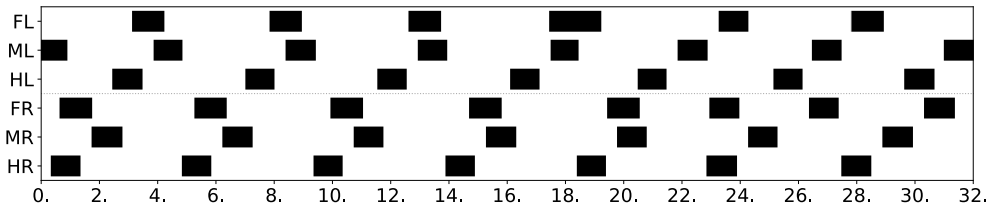
a)



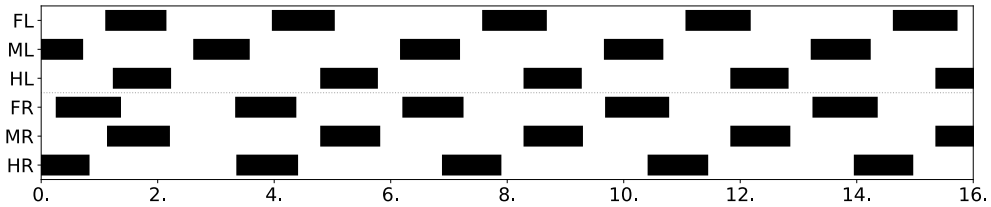

b)




c)




d)



e)

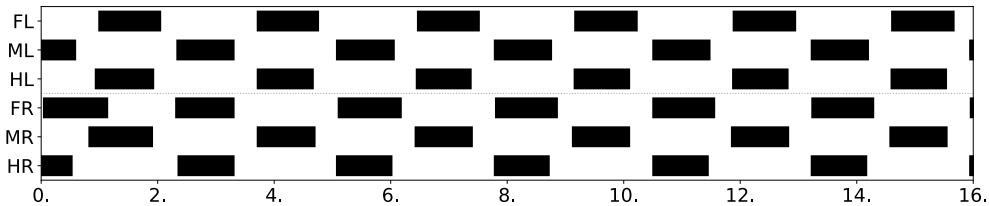



**Fig. S1: Footfall pattern for simulated Hector walking straight with different velocities**: ranging from very slow to fast walking. Velocity factor (parameter default_speed WalknetSettings.py) in a) = 0.004 (wave gait emerges), b) = 0.008 (intermediate pattern), c) = 0.012, d) = 0.016 (tetrapod gait pattern), e) = 0.020 (tripod gait). Black bars indicate swing movement of the respective leg: front, middle and hind left leg, front, middle and hind right leg, from top to bottom. Abscissa is simulation time in seconds.

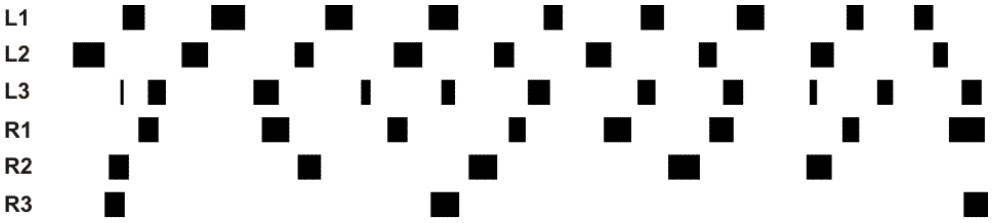



**Fig. S2: Footfall pattern for curve walking** (turn towards the right), black bars indicate swing movement of the respective leg, abscissa: simulation time, the lower bar indicates 500 iterations corresponding to 5s real time. Simulation data is taken from [Schilling et al. 2013b].