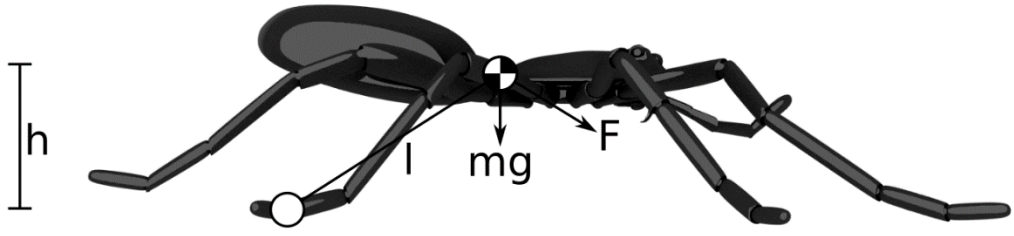
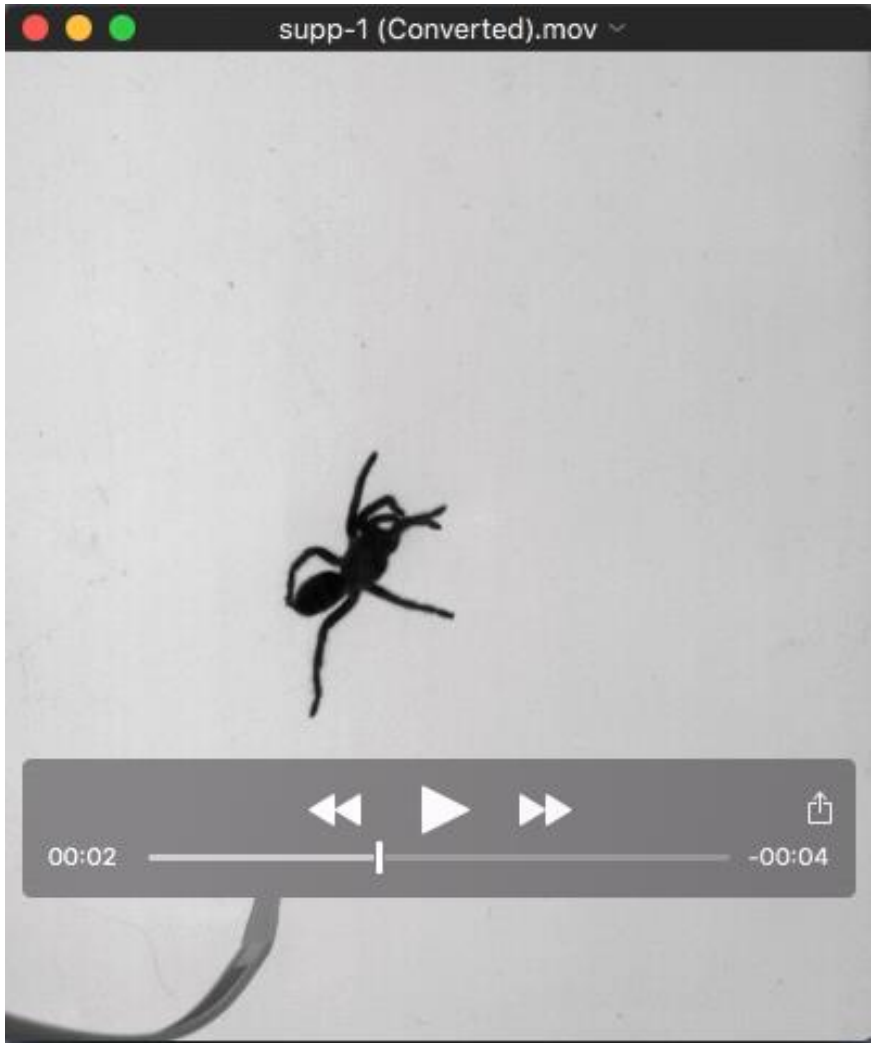


Fig. S1. Illustration of the calculation of characteristic torque and/or overturning moment. This image is credited to Michele Serpe (user *seiyoushimi* of Blendswap). A side view of a spider undergoing locomotion. The annotated leg highlights the length of the leg, l, force due to the acceleration of gravity mg, the force applied at "hip", F, and the height of the spider h. For the purposes of obtaining an approximate overturning moment the length of the leg is taken to be some multiple of the height of the spider close to unity for $\sin\theta$ approximately 1), and the force applied is assumed to be comparable to the magnitude of the spiders weight (Alexander and Jayes (1983), for F approximately mg), again with some multiple. In addition the spider has either six or eight legs, reducing the magnitude of the force on each leg by around an order of magnitude. Our estimate of the overturning moment is therefore only likely accurate to within an order of magnitude.

Alexander, R. M. N. and Jayes, A. S. (1983). A dynamic similarity hypothesis for the gaits of quadrupedal mammals. *J. Zool.* 201, 135-152. doi:10.1111/j.1469-7998.1983.tb04266.x



Movie 1. High-speed video of a juvenile Guatemalan tiger rump tarantula (*Davis pentaloris*) tripping and recovering during a running trial on a flat, stiff surface. Video was recorded in dorsal view using a Photron SA-3 camera set at 500 fps and 1/1000 s shutter. The presented video is slowed approximately 16 times.