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Control of Interlimb Coordination in Drosophila[1] AMBER YOUNG, Yale University — Animals and insects adjust how they move through dynamic environments by changing speeds and altering walking patterns. This flexible control over their limbs stems from networks of spinal neurons called central pattern generators. Distinct central pattern generators control the motor output for contralateral and ipsilateral limbs. Yet, the neural mechanisms responsible for producing limb coordination have not been identified due to the overwhelmingly large number of neurons in quadruped mammals. Drosophila has shown itself to be an exemplary subject for neuroscience studies since the fruit fly has relatively fewer neurons while maintaining complex behaviors. The ultimate goal of this project is to determine whether central pattern generators are coupled in Drosophila, and whether this contributes to limb coordination during walking. To experiment, I suspended a fly on a moving treadmill and captured its limb positions with an overhead camera. I then analyzed the limb positions over time using DeepLabCut. Understanding how the limbs are coordinated will also inform the coupling amongst central pattern generators. Characterizing their mechanisms will contribute to neuromechanics and physiological studies in humans, particularly relating to the neural basis of locomotion.

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