Project Title	Markerless pose-estimation to study the effects of leg loss on insect locomotion
Supervisor	Dr David Labonte
Theme(s)	Biomechanics and Mechanobiology Computational and Theoretical Modelling
Project Description	Insects regularly lose or let go of limbs yet are still able to walk. The strategies insects use to adjust locomotion after leg loss may inspire strategies to enable robots to continue to function even when limbs are lost or damaged. In order to understand more about the adaptations deployed by insects upon leg loss, we will use deep neural network based markerless pose estimation to study insect locomotion. Our goal is to not only gather a deeper understanding of hexapod locomotion with different numbers of legs, but also to produce a versatile, robust and automated detection and tracking process for studying limb orientations in diverse climbing animals. A background in machine learning and computer vision is required for this project, as one of our main objectives is to train and evaluate an architecture based on DeepLabCut, in order to accurately estimate the limb positions of different species and investigate the transferability of the learned models. You will gain insights into the use and implementation of deep neural networks, creation and challenges of labelled training data sets, 3D reconstruction of tracking data, and the biomechanics of insect locomotion. For more information on the group: http://evo-biomech.ic.ac.uk/