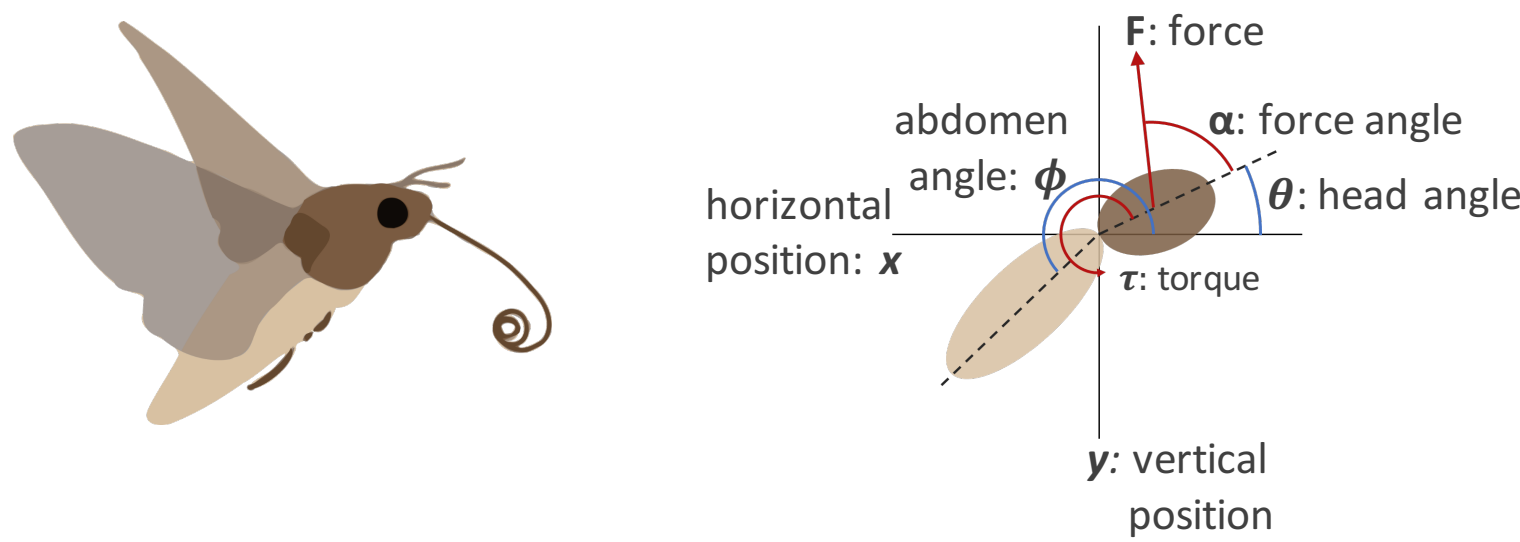


Motivation

Learning a non-linear controller for insect flight dynamics with a deep neural network

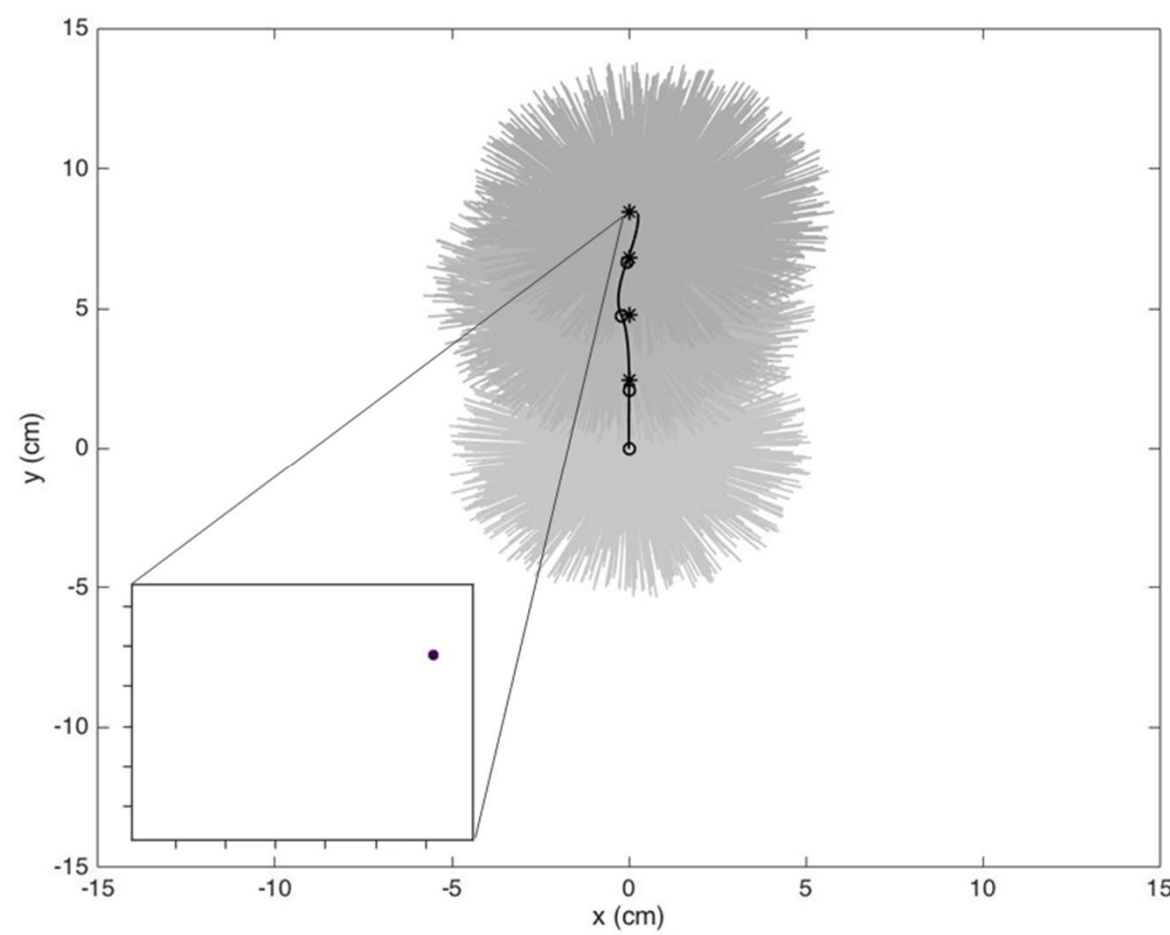


Methods

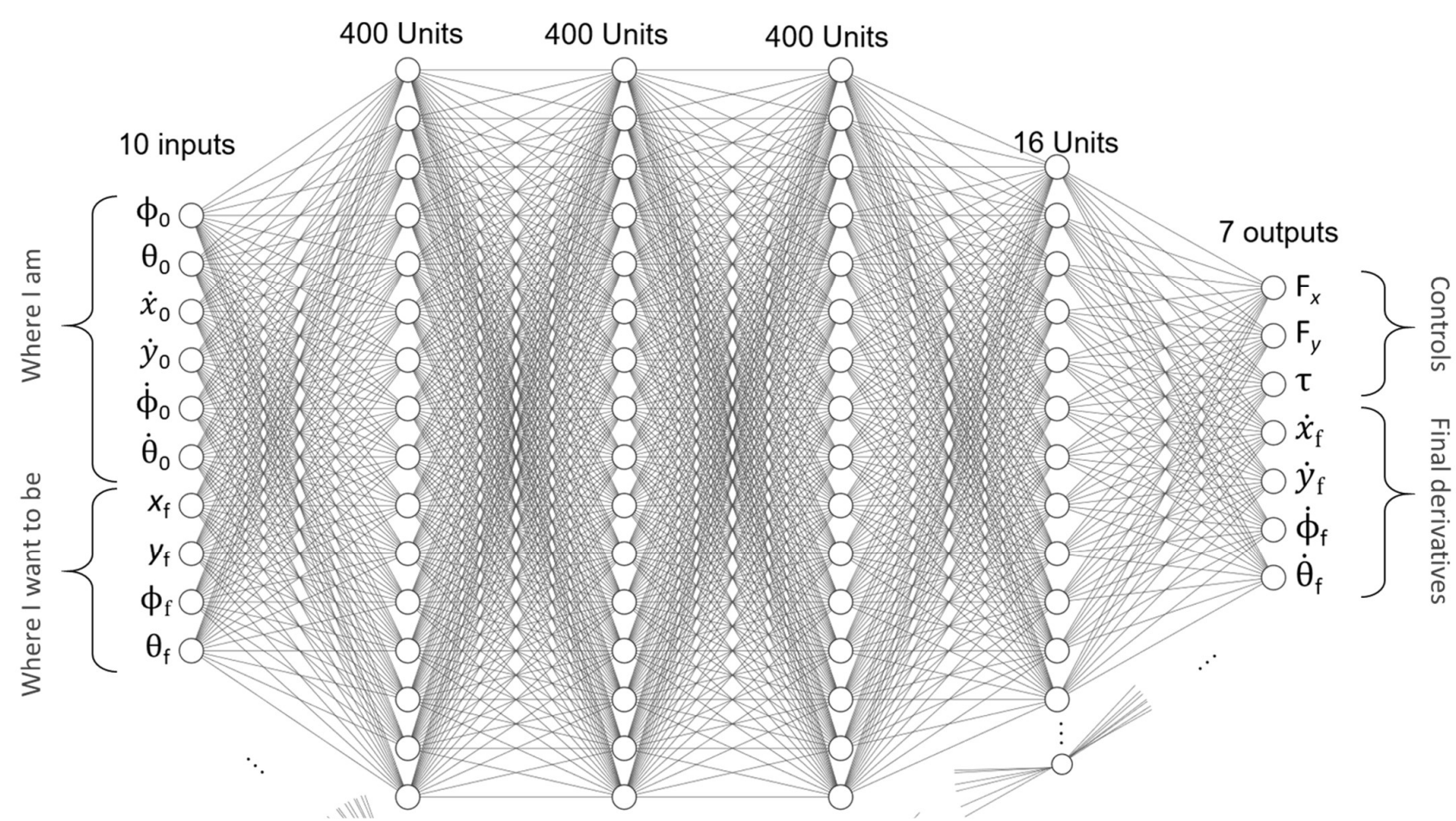
Build a virtual moth

Jorge Bustamante

Question: What is the temporal pattern of forces required to follow a complex trajectory? If I know where I am, and where I want to go, how do I get there?



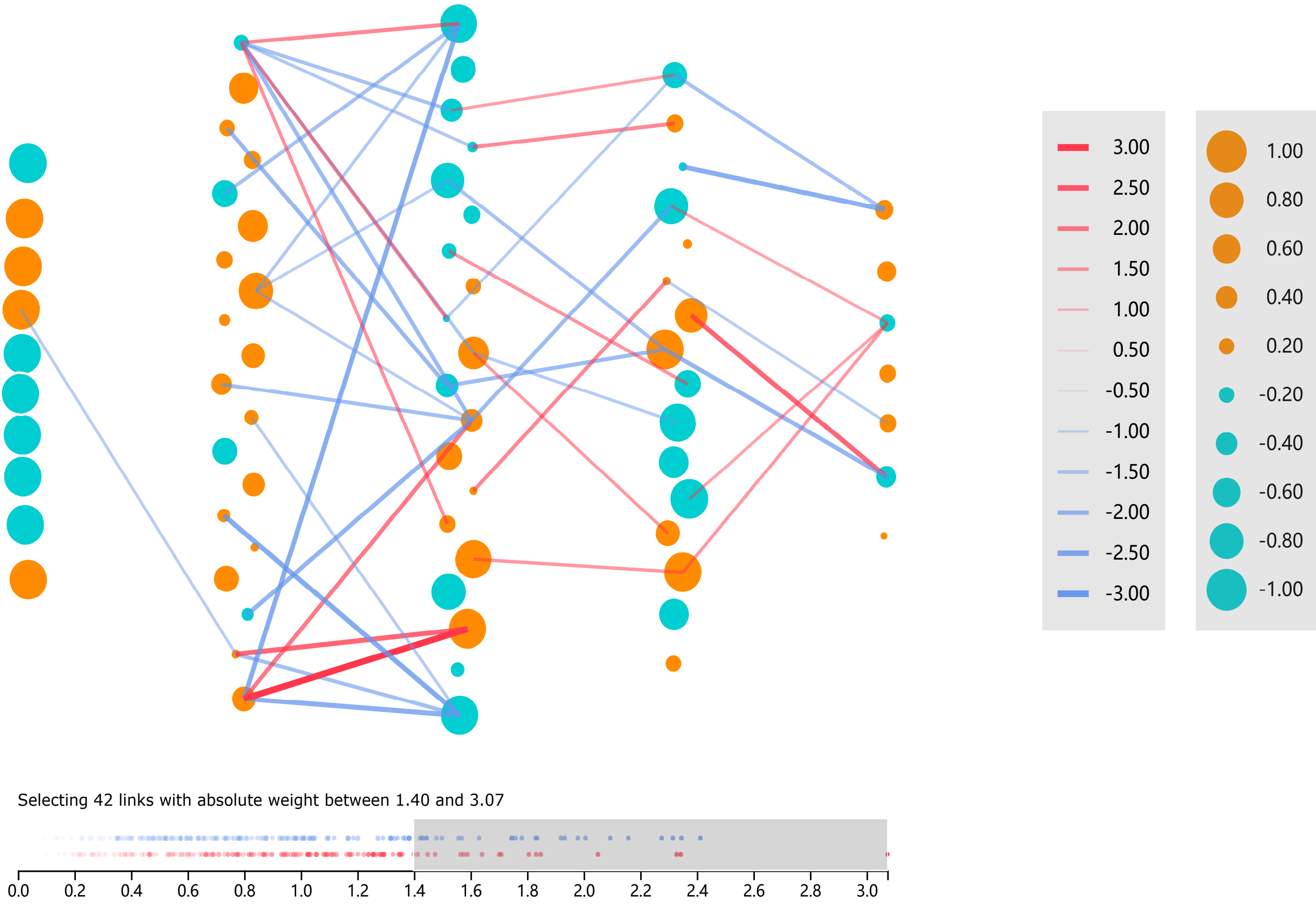
Answer: Deep learning + Model Predictive Control



Goal: Visualize the "internal workings" of a feed forward neural network.

Visualizing neural network architecture

This is a nerual network with 3 hidden layers of size: 20, 20, 16.
The inputs are: $\phi_0 = \theta_0 = \dot{x}_0 = \dot{y}_0 = \dot{\phi}_0 = \dot{\theta}_0 = -0.5$ and $x_f = y_f = \phi_f = \theta_f = 0.5$.



This is a nerual network with 4 hidden layers of size: 512, 512, 512, 512.
The inputs are: $\phi_0 = \theta_0 = \dot{x}_0 = \dot{y}_0 = \dot{\phi}_0 = \dot{\theta}_0 = x_f = y_f = \phi_f = \theta_f = 0$.

