Uncovering animal movement decisions from positional data

Behavioural ecology seeks to understand the decisions animals make. Whilst people might probe the brains of lab animals to figure this out, when it comes to decisions of animals in the wild, we often only have positional data to inform us of what the animal is doing and why. In this talk, I will explain methods for inferring movement decisions from positional data. I will then detail two ways of truth-testing these inferences: (1) using the emergent spatial patterns from the resulting movement-and-interaction models, and (2) testing the closeness of these models to data using a novel application of the so-called "Earth Mover's Metric". Finally, I'll discuss the interesting mathematical and statistical challenges that arise from these endeavors.