

From the Depth to the Stars: How modeling Shark Movements Illuminates Star Behavior

In this talk I will present how I have been able to use hidden Markov models (HMMs) in two fields, ecology and astronomy, all while conducting inference in a Bayesian framework. HMMs provide a framework to model time series data that are non-stationary; they allow for systems to be in different states at different times and consider the probabilities that describe the switching dynamics between states. In the field of movement ecology in particular, HMMs have become a popular tool for the analysis of movement data because of their ability to connect observed movement data to an underlying latent process, generally interpreted as the animal's unobserved behavior. Further, we can model the tendency to persist in a given behavior over time. In astronomy, we worked on an HMM formulation for discovering stellar flares in light curve data of stars. In the context of stellar flares discovery, we exploit the HMM framework by allowing the light curve of a star to be in one of three states at any given time step: Quiet, Firing, or Decaying. This three-state HMM formulation is designed to enable straightforward identification of stellar flares, their duration, and associated uncertainty. This is crucial for estimating the flare's energy, and is useful for studies of stellar flare energy distributions.

Vianey Leos Barajas

Department of Statistical Sciences/School of the Environment - University of Toronto

Lunes 16 de Diciembre de 2024, 14.00 horas

Salón Multifuncional FCEA

Modalidad: Híbrido

<https://salavirtual-udelar.zoom.us/j/86265037910?pwd=98eXF8NiTwEJcANXba0NQbbCfOXJXx.1>

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