Statistics and Actuarial Science Seminar

Title: Assessing competitive balance in the English Premier League for over forty seasons using a stochastic block model

Speaker: Nial Friel (University College Dublin)

Date: Mon 24th January 2022 at 12:00PM

Location: Online

Abstract: Competitive balance is a desirable feature in any professional sports league and encapsulates the notion that there is unpredictability in the outcome of games as opposed to an imbalanced league in which the outcome of some games are more predictable than others, for example, when an apparent strong team plays against a weak team. In this paper, we develop a model-based clustering approach to provide an assessment of the balance between teams in a league. We propose a novel Bayesian model to represent the results of a football season as a dense network with nodes identified by teams and categorical edges representing the outcome of each game. The resulting stochastic block model facilitates the probabilistic clustering of teams to assess whether there are competitive imbalances in a league. A key question then is to assess the uncertainty around the number of clusters or blocks and consequently estimation of the partition or allocation of teams to blocks. To do this, we develop an MCMC algorithm that allows the joint estimation of the number of blocks and the allocation of teams to blocks. We apply our model to each season in the English premier league from 1978/79 to 2019/20. A key finding of this analysis is evidence which suggests a structural change from a reasonably balanced league to a two-tier league which occurred around the early 2000's.

Join the Zoom call: https://ucd-ie.zoom.us/j/68316324831