

## Simulating the Hot Hand Phenomenon in Basketball with Bayesian Hidden Markov Models

**Authors :** Gabriel Calvo, Carmen Armero, Luigi Spezia

**Abstract :** A basketball player is said to have a hot hand if his/her performance is better than expected in different periods of time. A way to deal with this phenomenon is to make use of latent variables, which can indicate whether the player is 'on fire' or not. This work aims to model the hot hand phenomenon through a Bayesian hidden Markov model (HMM) with two states (cold and hot) and two different probability of success depending on the corresponding hidden state. This task is illustrated through a comprehensive simulation study. The simulated data sets emulate the field goal attempts in an NBA season from different profile players. This model can be a powerful tool to assess the 'streakiness' of each player, and it provides information about the general performance of the players during the match. Finally, the Bayesian HMM allows computing the posterior probability of any type of streak.

**Keywords :** Bernoulli trials, field goals, latent variables, posterior distribution

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