Having a Ball: evaluating game excitement and scoring streaks using in-match trend estimation

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Abstract

Nu ved jeg godt nok intet om sport, men...

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1 Introduction

We introduce the Execitement Trend Index (ETI) as an objective measure of spectator exicitement in a given match.

- Excitement defineret som skift af hvem, der er i føring
- Vurdering af om et hold trender lige pt.
- Identificere hvilket "hot periods" et hold har i løbet af en kamp til efterfølgende evaluering

Ref til trends

Needs a reference and some kind of comparison to "Rank dynamics for functional data" by Chen, Dawson and Müller, Computational Statistics and Data Analysis, 149, 2020.

Vi kan overveje, om vi ikke udelukkende burde fokusere på Eddy i dette manus og foreslå dette som et objektivt excitement index i stedet for at gå ind i en diskussion om TDI også.

2 Methods

Let m index a given match between teams a and b and let $D_m(t_{m_i}) = S_a(t_{m_i}) - S_b(t_{m_i})$ be the difference in scores at times $t_{m_1} < t_{m_2} < t_{m_i} < \ldots$ being the ordered event times when a score by either team a or b occurs during match m.

We then look at the model

$$\begin{aligned}\Theta_m &\sim F_m\\ f_m(t) \mid \Theta_m &\sim \mathcal{GP}(\mu_{\beta_m}, C_{\theta_m})\\ D_m(t_{m_i}) \mid f_m(t_{m_i}), t_{m_i}, \Theta_m &\overset{iid}{\sim} N(f_m(t_{m_i}), \sigma_m^2)\end{aligned}$$

where $\Theta_m = (\beta_m, \theta_m, \sigma_m^2)$ and f_m is a latent (?, proper name) trajectory of score differences.

- Trenderen
- TDI
- Excitement Trend Index

We need to argue that $S_a(t_{m_i}) - S_b(t_{m_i})$ is symmetric in a and b so that our choice of "reference group" is arbitrary/not important.

3 Results

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4 Discussion

We could define a weighted Excitement Trend Index wETI, so that zero crossings of the derivative of score differences are weighted higher towards the end of the game as in

$$\mathrm{wETI} = \int_0^{48} w(t) d\mathrm{ETI}(t)$$

where $w(t)$ is then an increasing weight function.

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Bibliography