



Bayesian Online Changepoint Detector

Has this side actually changed, or is it a run of coins?

Adams and MacKay's run-length posterior on the residuals of a price, so the detector judges a side against what was expected of it rather than against its own recent form.

SPORT

Any

FAMILY

The machine layer

LICENCE

£449

one-off, perpetual

RUNNING IN THE PLATFORM

<https://edgewortharena.com/arena/api/ml/league?comp=E0>

Inputs

NAME	TYPE	UNITS	WHERE IT COMES FROM
residuals	list of float	standard deviations	goal difference minus the pre-match expectation, standardised
hazard (optional)	float	1/matches	your prior on how often a real change happens; 1/40 is the platform's
sigma (optional)	float	standard deviations	observation noise

Outputs

NAME	TYPE	UNITS	NOTES
run_length_posterior	array	probability	
p_change_last_k	float for k in 3, 5, 10	probability	
regime_mean	float	standard deviations	

Method

- 1 Keep a distribution over the run length, the number of observations since the last change.

THIS IS THE SAMPLE

The method runs to 3 steps; one is shown. The assumptions, the limits, the module layout and the reference implementation come with the licence. Everything on the page below this -- what the model was measured at -- is the same in both versions, because that is the part you should not have to take on trust.



What it was measured at

Run on the residuals of the walk-forward prices, so a side is judged against what was expected of it.

MEASURE	RESULT	READING
Sides tracked	18	
Flagged above 50% in the last ten	1	a detector that fires on everything is not a detector
Hazard	1 in 40	the prior on how often a real change happens
Observation model	normal, conjugate prior	so the update is closed form

Assumptions

What has to be true for the numbers to mean what they say.

- Residuals are normal around a piecewise-constant level. Heavy tails make the detector jumpy; the platform standardises first for that reason.

Limits

Where it is known to be wrong. Published because a model without stated limits is one nobody has pushed on.

- It is a detector, not a forecast. It tells you a level has moved; it does not tell you where the level is going.

LICENCE

Issued to Evaluation copy. One perpetual licence to use and modify this model inside your own organisation. Redistribution of the specification or the reference implementation is not included. No warranty is given: the validation above is the whole of the claim being made.