



Hedge Expert Mixture

Combine forecasters online, with a bound on how far behind the best one you can end up.

Exponential weights over any set of probabilistic forecasters, with the regret bound that makes the weights worth trusting.

SPORT

Any

FAMILY

The machine layer

LICENCE

£349

one-off, perpetual

RUNNING IN THE PLATFORM

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

Inputs

NAME	TYPE	UNITS	WHERE IT COMES FROM
experts	list of names	-	your forecasters: a model, a market, a base rate
forecasts	dict per match of expert -> probabilities	probability	
results	list	-	what happened
eta (optional)	float	-	learning rate; 0.5 is the platform's

Outputs

NAME	TYPE	UNITS	NOTES
weights	dict	-	
mixture	probabilities per match	probability	
regret_bound	float	nats	

Method

- 1 Start uniform. After each result multiply every expert's weight by $\exp(-\eta \ell)$, where ℓ is its log loss on that result, then renormalise.

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

Four experts per league: a base rate, the goals model, the shots blend and the closing line.

MEASURE	RESULT	READING
Leagues	1	
Weight the mixture gives the closing line	0.97 to 0.97	it learns what the Trust tab already says
Mixture loss minus the best expert's	+0.0037 to +0.0037	nats per match; the bound guarantees this stays small
Regret bound	$\ln N / \eta + \eta T / 8$	worst case over any sequence, not an average

Assumptions

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

- Losses are bounded, which log loss is not unless probabilities are clipped. The implementation clips at 1e-9 and says so.

Limits

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

- It converges on the best single expert, and cannot beat it by much. If one of your experts is a closing line, expect the mixture to become that line.

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.