



Specification-to-Effect Regression

Predict the effect of a product nobody has measured, from the ones somebody has.

A physics-informed Bayesian ridge in which the known term is fixed at its published value and only the unknown ones are learnt, with leave-one-out error printed beside every prediction.

SPORT

Any

FAMILY

Evidence and gear

LICENCE

£349

one-off, perpetual

RUNNING IN THE PLATFORM

<https://edgewortharena.com/arena/api/gear/evidence?kind=shoes>

Inputs

NAME	TYPE	UNITS	WHERE IT COMES FROM
measured products	list of (specification vector, effect, interval)	mixed	the literature
fixed coefficients	dict	-	the terms physics already settles, such as mass
prior sd (optional)	float	-	how far the learnt terms may roam

Outputs

NAME	TYPE	UNITS	NOTES
coefficients and their errors	dict	-	
prediction and sd per product	floats	-	
leave-one-out error	float	-	
gap to the maker's claim	float	-	

Method

- 1 Subtract the fixed physical term from the measured effects, so the regression only learns what is left.

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

Fitted now, on the shoes with independent measurements, and used to predict the rest.

MEASURE	RESULT	READING
Training products	10	the ones with literature or physics behind them
Leave-one-out error	0.94 points	on an effect of about 4%
Fixed by physics	mass, at 1% per 100 g	only the rest is learnt
Largest gap to a maker's claim	+1.8 points	Puma Fast-R Nitro Elite 3

Assumptions

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

- The specification vector contains the things that matter. If it does not, the residual will be large and the leave-one-out error will say so.

Limits

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

- Ten measured products is a small training set; the model exists to bound a claim, not to certify a product.

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.