Cornell University Library

We gratefully acknowledge support from the Simons Foundation and member institutions

arXiv.org > math > arXiv:1303.2236

Search or Article-id

(Help | Advanced search)

All papers | Go!

**Mathematics > Statistics Theory**

# COBRA: A Nonlinear Aggregation Strategy

[Gérard Biau](#) (LSTA, LPMA, DMA, INRIA Paris - Rocquencourt), [Aurélie Fischer](#) (LPMA), [Benjamin Guedj](#) (LSTA), [James Malley](#) (MSCL)

*(Submitted on 9 Mar 2013)*

A new method for combining several initial estimators of the regression function is introduced. Instead of building a linear or convex optimized combination over a collection of basic estimators $r_1,...,r_M$, we use them as a collective indicator of the distance between the training data and a test observation. This local distance approach is model-free and extremely fast. Most importantly, the resulting collective estimator is shown to perform asymptotically at least as well in the $L^2$ sense as the best basic estimator in the collective. Moreover, it does so without having to declare which might be the best basic estimator for the given data set. A companion R package called \cobra (standing for COmBined Regression Alternative) is presented (downloadable on \url{[this http URL](#)}). Numerical evidence is provided on both synthetic and real data sets to assess the excellent performance of our method in a large variety of prediction problems.

| | |
|---|---|
| Comments: | 30 pages, 3 tables, 9 figures |
| Subjects: | **Statistics Theory (math.ST)**; Methodology (stat.ME) |
| Cite as: | **arXiv:1303.2236 [math.ST]** |
| | (or **arXiv:1303.2236v1 [math.ST]** for this version) |

## Submission history

From: Benjamin Guedj [view email]

**[v1]** Sat, 9 Mar 2013 16:52:59 GMT (660kb,D)

*Which authors of this paper are endorsers?*

References & Citations

- NASA ADS

Bookmark(what is this?)