Towards AIC-like model weights and model averaging of black-box models

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Abstract: Machine-learning methods such as neural networks or boosted and bagged approaches are currently combined with more parametric methods in a typically unweighted fashion. The reason is that no AIC (or equivalent) can be computed for them, as the number of parameters in a model fit cannot be readily quantified. We here present an approach based on Generalised (or Effective) Degrees of Freedom and illustrate its application with a species distribution analysis. This approach offers some potential, but also has some computational drawbacks. We shall therefore also present an alternative based on cross-validation.