

Use of Generalized Additive Models in studies of association, prediction, and clasification

Carmen Cadarso-Suárez*
Unit of Biostatistics, School of Medicine.
University of Santiago de Compostela
e-mail: carmen.cadarso@usc.es

Abstract

Publications in many biomedical fields have shown an interest in the application of Generalized Additive Models (GAMs, Hastie and Tibshirani, 1990) since this type of models constitute a good compromise between flexibility and interpretability, while avoiding the curse of the dimensionality. GAMs including interactions can be adapted adequately in biomedical studies of association, prediction, and classification. Based on GAMs, flexible effect curves such as the Odds-Ratio (for association purposes), and Receiver Operating Characteristic (ROC) regression curves (for the purposes of classification and prediction) can be readily obtained. The GAM-based statistical procedures may be extended appropriately to deal with some interesting extensions models, like the additive multi-state model for survival analysis. Finally, all the methods are illustrated with real data arising from various biomedical fields, discussing the necessity of development of user-friendly software, to use this modern statistical methodology in practice.

References

- [1] Hastie, T.J. and Tibshirani, R.J. , *Generalized Additive Models*. Chapman and Hall, (1990).

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