

**Hastie, T. J.; Tibshirani, R. J.**

**Generalized additive models.** (English) Zbl 0747.62061

*Monographs on Statistics and Applied Probability.* 43. London etc.: Chapman and Hall. xv, 335 p. (1990).

There are more than 250 references in this monograph and more than a half of them have been published after 1983. This clearly indicates that the book is on an actual, rapidly growing and important topic. The reason for this explosion is that increasing power of computers has also opened new doors to treat the most frequent problem in data analysis, namely regression with one or more independent variables.

The authors discuss a model which is halfway between the classical parametric approach with known regression functions and a fully nonparametric model. One still assumes additivity of the effects of the independent variables, but the regression functions are unknown. The authors introduced this model in 1986. Many new developments are collected in the book.

In chap. 2 popular smoothing techniques are described and in chap. 3 discussed in connection with statistical aspects. In chap. 4 the model is introduced and procedures (backfitting) are investigated which estimate the unknown regression functions. In chap. 5 some theoretical background is given for the heuristics before. Chap. 6-9 are devoted to extensions and special topics, chap. 10 provides two case studies.

The style seems to be clearly characterized by two, quite often used phrases: "We describe" and "a popular choice is". Most technical details are omitted or transferred into exercises, although I think they will rarely be used by a class. For that purpose much more background in applied and mathematical statistics and in numerical analysis would be necessary. For those who are familiar with nonlinear regression this book will however be a serious competitor to *P. McCullagh* and *J. A. Nelder's* "Generalized linear models" (1983; [Zbl 0588.62104](#)).

Reviewer: [O.Krafft \(Aachen\)](#)

**MSC:**

- [62J02](#) General nonlinear regression
- [62G07](#) Density estimation
- [62-02](#) Research exposition (monographs, survey articles) pertaining to statistics
- [65D10](#) Numerical smoothing, curve fitting

Cited in **5** Reviews  
Cited in **1007** Documents

**Keywords:**

[generalized additive models](#); [nonparametric regression](#); [data analysis](#); [transformation models](#); [smoothing techniques](#); [backfitting](#); [case studies](#); [exercises](#)