

Bayesian nonparametrics via neural networks

Lee, Herbert K.H., author

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Abstrak

Bayesian Nonparametrics via Neural Networks is the first book to focus on neural networks in the context of nonparametric regression and classification, working within the Bayesian paradigm. Its goal is to demystify neural networks, putting them firmly in a statistical context rather than treating them as a black box. This approach is in contrast to existing books, which tend to treat neural networks as a machine learning algorithm instead of a statistical model. Once this underlying statistical model is recognized, other standard statistical techniques can be applied to improve the model.

The Bayesian approach allows better accounting for uncertainty. This book covers uncertainty in model choice and methods to deal with this issue, exploring a number of ideas from statistics and machine learning. A detailed discussion on the choice of prior and new noninformative priors is included, along with a substantial literature review. Written for statisticians using statistical terminology, Bayesian Nonparametrics via Neural Networks will lead statisticians to an increased understanding of the neural network model and its applicability to real-world problems.

To illustrate the major mathematical concepts, the author uses two examples throughout the book: one on ozone pollution and the other on credit applications. The methodology demonstrated is relevant for regression and classification-type problems and is of interest because of the widespread potential applications of the methodologies described in the book.