



*mathematics*



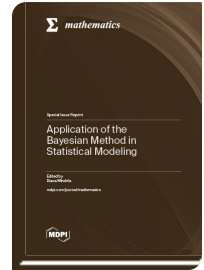
*Special Issue Reprint*

## Application of the Bayesian Method in Statistical Modeling

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Edited by  
Diana Mindrila

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Bayesian statistics is a theory in the field of statistics based on the Bayesian interpretation of probability, where probability expresses a degree of belief in an event. Bayesian statistical methods use Bayes' theorem to compute and update probabilities after obtaining new data. Named after Thomas Bayes, Bayes' theorem (1763) describes the conditional probability of an event based on data, as well as prior information or beliefs about the event or conditions related to the event. This approach differs from other interpretations of probability, such as the frequentist interpretation, which views probability as the limit of the relative frequency of an event after many trials. During much of the 20th century, many statisticians viewed Bayesian methods unfavorably due primarily to practical considerations. Bayesian methods required much computation to complete, and the most widely used methods during the previous century relied on frequentist interpretation. However, with the advent of powerful computers and new algorithms, such as Markov chain Monte Carlo, Bayesian methods have seen increasing use within statistics in the 21st century. This Special Issue will raise awareness of the availability and applicability of Bayesian analyses. It includes a collection of theoretical and applied studies using Bayesian statistics and provides information on statistical software that allows the use of Bayesian estimation methods.



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