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Brief

Series

JSS Research Series in Statistics

Statistics : Applied Statistics

Yamato, Hajime

Statistics Based on Dirichlet Processes and Related Topics

- Describes the Bayes estimate of the estimable parameter by using the Dirichlet process as a priori distribution
- Presents the convex combination of U-statistics for the estimable parameter
- Shows convergence to shifted Poisson distribution for the number of distinct components of Ewens' sampling formula

This book focuses on the properties associated with the Dirichlet process, describing its use as a prior for nonparametric inference and the Bayes estimate to obtain limits for the estimable parameter. It presents the limits and the well-known U- and V-statistics as a convex combination of U-statistics, and by investigating this convex combination, it demonstrates these three statistics. Next, the book notes that the Dirichlet process gives the discrete distribution with probability one, even if the parameter of the process is continuous. Therefore, there are duplications among the sample from the distribution, which are discussed. Because sampling from the Dirichlet process is described sequentially, it can be described equivalently by the Chinese restaurant process. Using this process, the Donnelly–Tavaré–Griffiths formulas I and II are obtained, both of which give the Ewens' sampling formula. The book then shows the convergence and approximation of the distribution for its number of distinct components. Lastly, it explains the interesting properties of the Griffiths–Engen–McCloskey distribution, which is related to the Dirichlet process and the Ewens' sampling formula.

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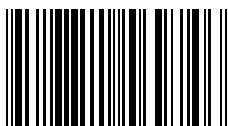
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