Advanced Mean Field Methods: Theory and Practice (Hardback)

By -

MIT Press Ltd, United States, 2001. Hardback. Book Condition: New. New.. 216 x 136 mm. Language: English . Brand New Book. A major problem in modern probabilistic modeling is the huge computational complexity involved in typical calculations with multivariate probability distributions when the number of random variables is large. Because exact computations are infeasible in such cases and Monte Carlo sampling techniques may reach their limits, there is a need for methods that allow for efficient approximate computations. One of the simplest approximations is based on the mean field method, which has a long history in statistical physics. The method is widely used, particularly in the growing field of graphical models. Researchers from disciplines such as statistical physics, computer science, and mathematical statistics are studying ways to improve this and related methods and are exploring novel application areas. Leading approaches include the variational approach, which goes beyond factorizable distributions to achieve systematic improvements; the TAP (Thouless-Anderson-Palmer) approach, which incorporates correlations by including effective reaction terms in the mean field theory; and the more general methods of graphical models. Bringing together ideas and techniques from these diverse disciplines, this book covers the theoretical foundations of advanced mean field methods, explores the...

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