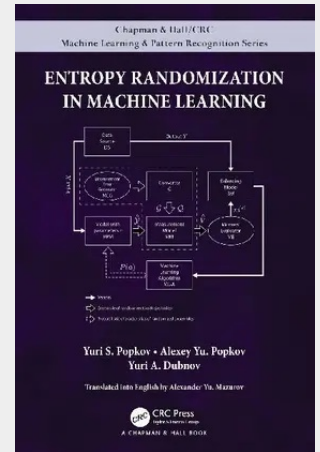


Entropy Randomization in Machine Learning

Entropy Randomization in Machine Learning presents a new approach to machine learning—entropy randomization—to obtain optimal solutions under uncertainty (uncertain data and models of the objects under study). Randomized machine-learning procedures involve models with random parameters and maximum entropy estimates of the probability density functions of the model parameters under balance conditions with measured data. Optimality conditions are derived in the form of nonlinear equations with integral components. A new numerical random search method is developed for solving these equations in a probabilistic sense. Along with the theoretical foundations of randomized machine learning, Entropy Randomization in Machine Learning considers several applications to binary classification, modelling the dynamics of the Earth's population, predicting seasonal electric load fluctuations of power supply systems, and forecasting the thermokarst lakes area in Western Siberia. Features • A systematic presentation of the randomized machine-learning problem: from data processing, through structuring randomized models and algorithmic procedure, to the solution of applications-relevant problems in different fields • Provides new numerical methods for random global optimization and computation of multidimensional integrals • A universal algorithm for randomized machine learning This book will appeal to undergraduates and postgraduates specializing in artificial intelligence and machine learning, researchers and engineers involved in the development of applied machine learning systems, and researchers of forecasting problems in various fields.



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