Pattern recognition and machine learning /

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Textbooks | Problems and exercises

Monografía

The field of pattern recognition has undergone substantial development over the years. This book reflects these developments while providing a grounding in the basic concepts of pattern recognition and machine learning. It is aimed at advanced undergraduates or first year PhD students, as well as researchers and practitioners

Título: Pattern recognition and machine learning Christopher M. Bishop

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Nota general: Textbook for graduates

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Contenido: Introduction. Example : polynomial curve fitting ; Probability theory ; Model selection ; The curse of dimensionality ; Decision theory ; Information theory -- Probability distributions. Binary variables ; Multinomial variables ; The Gaussian distribution ; The exponential family ; Nonparametric methods -- Linear models for regression. Linear basis function models ; The bias-variance decomposition ; Bayesian linear regression ; Bayesian model comparison ; The evidence approximation ; Limitations of fixed basis functions -- Linear models for classification. Discriminant functions ; Probabilistic generative models ; Probabilistic discriminative models ; The Laplace approximation ; Bayesian logistic regression -- Neural networks. Feed-forward network functions ; Network training ; Error backpropagation ; The Hessian matrix ; Regularization in neural networks ; Mixture density networks ; Bayesian neural networks -- Kernel methods. Dual representations ; Constructing kernels ; Radial basis function networks ; Gaussian processes -- Sparse Kernel machines. Maximum margin classifiers ; Relevance vector machines -- Graphical models. Bayesian networks ; Conditional independence ; Markov random fields ; Inference in graphical models -- Mixture models and EM. K-means clustering ; Mixtures of Gaussians ; An alternative view of EM ; The EM algorithm in general -- Approximate inference. Variational inference ; Illustration : variational mixture of Gaussians ; Variational linear regression ; Exponential family distributions ; Local variational methods ; Variational logistic regression ; Expectation propagation -- Sampling methods. Basic

sampling algorithms ; Markov chain Monte Carlo ; Gibbs sampling ; Slice sampling ; The hybrid Monte Carlo algorithm ; Estimating the partition function-- Continuous latent variables. Principal component analysis ; Probabilistic PCA ; Kernel PCA ; Nonlinear latent variable models -- Sequential data. Markov models ; Hidden Markov models ; Linear dynamical systems -- Combining models. Bayesian model averaging ; Committees ; Boosting ; Tree-based models ; Conditional mixture models -- Data sets -- Probability distributions -- Properties of matrices -- Calculus of variations -- Lagrange multipliers

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