

Free reading Learning and soft computing support vector machines neural networks and fuzzy logic models complex adaptive systems (2023)

Support Vector Machines: Theory and Applications Support Vector Machines Applications Support Vector Machines A Gentle Introduction to Support Vector Machines in Biomedicine: Theory and methods A Gentle Introduction to Support Vector Machines in Biomedicine Twin Support Vector Machines An Introduction to Support Vector Machines and Other Kernel-based Learning Methods Learning with Kernels Support Vector Machine Support Vector Machine. Examples with MATLAB Support Vector Machine in Chemistry Rule Extraction from Support Vector Machines □□□□□□□□□□ Support Vector Machines Support Vector Machines and Their Application in Chemistry and Biotechnology Learning with Support Vector Machines Least Squares Support Vector Machines Least Squares Support Vector Machines Support Vector Machines □□□□□□□□□□ Support Vector Machines for Pattern Classification Knowledge Discovery with Support Vector Machines □□□□□□□□□□□□□□□□ Support Vector Machines and Perceptrons Support Vector Machines Support Vector Machines for Antenna Array Processing and Electromagnetics Fundamentals of Machine Learning □□□□□□□□□□ HOW TO FINE-TUNE SUPPORT VECTOR MACHINES FOR CLASSIFICATION Learning to Classify Text

Using Support Vector Machines Learning with Fractional Orthogonal Kernel Classifiers in Support Vector Machines Regularization, Optimization, Kernels, and Support Vector Machines Support Vector Machines and Evolutionary Algorithms for Classification Machine Learning with SVM and Other Kernel Methods Pattern Recognition with Support Vector Machines □□□□□□□□□□ An Introduction to Support Vector Machines Support Vector Machines in Data Mining Support Vector Machines for Antenna Array Processing and Electromagnetics I Support Vector Machine

Support Vector Machines: Theory and Applications

2005-06-21

the support vector machine svm has become one of the standard tools for machine learning and data mining this carefully edited volume presents the state of the art of the mathematical foundation of svm in statistical learning theory as well as novel algorithms and applications support vector machines provides a selection of numerous real world applications such as bioinformatics text categorization pattern recognition and object detection written by leading experts in their respective fields

Support Vector Machines Applications

2014-02-12

support vector machines svm have both a solid mathematical background and practical applications this book focuses on the recent advances and applications of the svm such as image processing medical practice computer vision and pattern recognition machine learning applied statistics and artificial intelligence the aim of this book is to create a comprehensive source on support vector machine applications

Support Vector Machines

2008-09-15

every mathematical discipline goes through three periods of development the naive the formal and the critical david hilbert the goal of this book is to explain the principles that made support vector machines svms a successful modeling and prediction tool for a variety of applications we try to achieve this by presenting the basic ideas of svms together with the latest developments and current research questions in a uni ed style in a nutshell we identify at least three reasons for the success of svms their ability to learn well with only a very small number of free parameters their robustness against several types of model violations and outliers and last but not least their computational efficiency compared with several other methods although there are several roots and precursors of svms these methods gained particular momentum during the last 15 years since vapnik 1995 1998 published his well known textbooks on statistical learning theory with aspecialemphasisonsupportvectormachines sincethen the eldofmachine learninghaswitnessedintenseactivityinthestudyofsvms whichhasspread moreandmoretootherdisciplinessuchasstatisticsandmathematics thusit seems fair to say that several communities are currently working on support vector machines and on related kernel based methods although there are many interactions between these communities we think that there is still roomforadditionalfruitfulinteractionandwouldbegladifhistextbookwere found helpful in stimulating further research many of the results presented in this book have previously been scattered in the journal literature or are still under review as a consequence these results have been accessible only

to a relatively small number of specialists sometimes probably only to people from one community but not the others

A Gentle Introduction to Support Vector Machines in Biomedicine: Theory and methods

2011

support vector machines svms are among the most important recent developments in pattern recognition and statistical machine learning they have found a great range of applications in various fields including biology and medicine however biomedical researchers often experience difficulties grasping both the theory and applications of these important methods because of lack of technical background the purpose of this book is to introduce svms and their extensions and allow biomedical researchers to understand and apply them in real life research in a very easy manner the book is to consist of two volumes theory and methods volume 1 and cases studies volume 2 the proposed book follows the approach of programmed learning whereby material is presented in short sections called frames each frame consists of a very small amount of information to be learned a multiple choice quiz and answers to the quiz the reader can proceed to the next frame only after verifying the correct answers to the current frame

A Gentle Introduction to Support Vector Machines in Biomedicine

2013-03-21

support vector machines svms are among the most important recent developments in pattern recognition and statistical machine learning they have found a great range of applications in various fields including biology and medicine however biomedical researchers often experience difficulties grasping both the theory and applications of these important methods because of lack of technical background the purpose of this book is to introduce svms and their extensions and allow biomedical researchers to understand and apply them in real life research in a very easy manner the book is to consist of two volumes theory and methods volume 1 and case studies volume 2

Twin Support Vector Machines

2016-10-12

this book provides a systematic and focused study of the various aspects of twin support vector machines twsvm and related developments for classification and regression in addition to presenting most of the basic models of twsvm and twin support vector regression twsvr available in the literature it also discusses the important and challenging applications of this new machine learning

methodology a chapter on additional topics has been included to discuss kernel optimization and support tensor machine topics which are comparatively new but have great potential in applications it is primarily written for graduate students and researchers in the area of machine learning and related topics in computer science mathematics electrical engineering management science and finance

An Introduction to Support Vector Machines and Other Kernel-based Learning Methods

2000-03-23

this is a comprehensive introduction to support vector machines a generation learning system based on advances in statistical learning theory

Learning with Kernels

2018-06-05

a comprehensive introduction to support vector machines and related kernel methods in the 1990s a new type of learning algorithm was developed based on results from statistical learning theory the support vector machine svm this gave rise to a new class of theoretically elegant learning machines that use a central concept of svms kernels for a number of learning tasks kernel machines provide a

modular framework that can be adapted to different tasks and domains by the choice of the kernel function and the base algorithm they are replacing neural networks in a variety of fields including engineering information retrieval and bioinformatics learning with kernels provides an introduction to svms and related kernel methods although the book begins with the basics it also includes the latest research it provides all of the concepts necessary to enable a reader equipped with some basic mathematical knowledge to enter the world of machine learning using theoretically well founded yet easy to use kernel algorithms and to understand and apply the powerful algorithms that have been developed over the last few years

Support Vector Machine

2023-06-23

what is support vector machine in the field of machine learning support vector machines are supervised learning models that examine data for classification and regression analysis these models come with related learning algorithms vladimir vapnik and his coworkers at at t bell laboratories were responsible for its creation because they are founded on statistical learning frameworks or the vc theory which was developed by vapnik and chervonenkis 1974 support vector machines svms are among the most accurate prediction systems a non probabilistic binary linear classifier is what results when an svm training algorithm is given a series of training examples each of which is marked as belonging to one of two categories the algorithm then develops a model that assigns subsequent examples to either one of the two categories or neither of them the support vector machine svm

allocates training examples to points in space in such a way as to maximize the difference in size between the two categories after that new examples are mapped into that same space and depending on which side of the gap they fall on a prediction is made as to which category they belong to how you will benefit i insights and validations about the following topics chapter 1 support vector machine chapter 2 linear classifier chapter 3 perceptron chapter 4 projection linear algebra chapter 5 linear separability chapter 6 kernel method chapter 7 sequential minimal optimization chapter 8 least squares support vector machine chapter 9 hinge loss chapter 10 polynomial kernel ii answering the public top questions about support vector machine iii real world examples for the usage of support vector machine in many fields iv 17 appendices to explain briefly 266 emerging technologies in each industry to have 360 degree full understanding of support vector machine technologies who this book is for professionals undergraduate and graduate students enthusiasts hobbyists and those who want to go beyond basic knowledge or information for any kind of support vector machine

Support Vector Machine. Examples with MATLAB

2017-05-02

in machine learning support vector machines svms also support vector networks are supervised learning models with associated learning algorithms that analyze data used for classification and regression analysis given a set of training examples each marked as belonging to one or the other of two categories an svm training algorithm builds a model that assigns new examples to one category or the other making it a non probabilistic binary linear classifier an svm model is a representation of

the examples as points in space mapped so that the examples of the separate categories are divided by a clear gap that is as wide as possible new examples are then mapped into that same space and predicted to belong to a category based on which side of the gap they fall in addition to performing linear classification svms can efficiently perform a non linear classification using what is called the kernel trick implicitly mapping their inputs into high dimensional feature spaces this book develops support vector machine techniques

Support Vector Machine in Chemistry

2004

in recent years a new method of data processing using the support vector machine svm has been introduced to the field of chemistry compared with other methods of data processing the svm has the advantage of good prediction reliability it is especially suitable for small sample sizes such as in chemical research on qsar qspr work materials and experimental design phase diagram prediction etc the svm is fast becoming a useful tool for chemists this book provides a systematic approach to the principles and algorithms of the svm and looks at its application in many branches of chemistry

Rule Extraction from Support Vector Machines

2008-01-04

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Support Vector Machines

2011

this book presents topical research in the study of support vector machines topics discussed include the support vector machine in medical imaging monthly air pollution modeling using support vector machine techniques in spain support vector machines for image interpolation schemes in image zooming and color array interpolation using svm for the prediction of the ultimate capacity of driven piles in cohesionless soils svm in medical classification tasks and pattern recognition for machine fault diagnosis using support vector machines

Support Vector Machines and Their Application in Chemistry and Biotechnology

2016-04-19

support vector machines svms are used in a range of applications including drug design food quality control metabolic fingerprint analysis and microarray data based cancer classification while most mathematicians are well versed in the distinctive features and empirical performance of svms many

chemists and biologists are not as familiar wi

Learning with Support Vector Machines

2022-05-31

support vectors machines have become a well established tool within machine learning they work well in practice and have now been used across a wide range of applications from recognizing hand written digits to face identification text categorisation bioinformatics and database marketing in this book we give an introductory overview of this subject we start with a simple support vector machine for performing binary classification before considering multi class classification and learning in the presence of noise we show that this framework can be extended to many other scenarios such as prediction with real valued outputs novelty detection and the handling of complex output structures such as parse trees finally we give an overview of the main types of kernels which are used in practice and how to learn and make predictions from multiple types of input data table of contents support vector machines for classification kernel based models learning with kernels

Least Squares Support Vector Machines

2002

this book focuses on least squares support vector machines ls svms which are reformulations to

standard svms ls svms are closely related to regularization networks and gaussian processes but additionally emphasize and exploit primal dual interpretations from optimization theory the authors explain the natural links between ls svm classifiers and kernel fisher discriminant analysis bayesian inference of ls svm models is discussed together with methods for imposing sparseness and employing robust statistics the framework is further extended towards unsupervised learning by considering pca analysis and its kernel version as a one class modelling problem this leads to new primal dual support vector machine formulations for kernel pca and kernel cca analysis furthermore ls svm formulations are given for recurrent networks and control in general support vector machines may pose heavy computational challenges for large data sets for this purpose a method of fixed size ls svm is proposed where the estimation is done in the primal space in relation to a nystrom sampling with active selection of support vectors the methods are illustrated with several examples

Least Squares Support Vector Machines

2012-12-17

support vector machines optimization based theory algorithms and extensions presents an accessible treatment of the two main components of support vector machines svms classification problems and regression problems the book emphasizes the close connection between optimization theory and svms since optimization is one of the pillars on which svms are built the authors share insight on many of their research achievements they give a precise interpretation of statistical learning theory for c support vector classification they also discuss regularized twin svms for binary classification

problems svms for solving multi classification problems based on ordinal regression svms for semi supervised problems and svms for problems with perturbations to improve readability concepts methods and results are introduced graphically and with clear explanations for important concepts and algorithms such as the crammer singer svm for multi class classification problems the text provides geometric interpretations that are not depicted in current literature enabling a sound understanding of svms this book gives beginners as well as more experienced researchers and engineers the tools to solve real world problems using svms

Support Vector Machines

2005-03

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2005-12-28

i was shocked to see a student s report on performance comparisons between support vector machines svms and fuzzy classi ers that we had developed withourbestendeavors classi cationperformanceofourfuzzyclassi erswas comparable but in most cases inferior to that of support vector machines this tendency was especially evident when the numbers of class data were small i

shifted my research efforts from developing fuzzy classifiers with high generalization ability to developing support vector machine based classifiers this book focuses on the application of support vector machines to pattern classification specifically we discuss the properties of support vector machines that are useful for pattern classification applications several multiclass models and variants of support vector machines to clarify their applicability to real world problems we compare performance of most models discussed in the book using real world benchmark data readers interested in the theoretical aspect of support vector machines should refer to books such as 109 215 256 257

Support Vector Machines for Pattern Classification

2011-09-20

an easy to follow introduction to support vector machines this book provides an in depth easy to follow introduction to support vector machines drawing only from minimal carefully motivated technical and mathematical background material it begins with a cohesive discussion of machine learning and goes on to cover knowledge discovery environments describing data mathematically linear decision surfaces and functions perceptron learning maximum margin classifiers support vector machines elements of statistical learning theory multi class classification regression with support vector machines novelty detection complemented with hands on exercises algorithm descriptions and data sets knowledge discovery with support vector machines is an invaluable textbook for advanced undergraduate and graduate courses it is also an excellent tutorial on support vector machines for professionals who are pursuing research in machine learning and related areas

Knowledge Discovery with Support Vector Machines

2022-12-01

Support Vector Machines (SVM) are a type of supervised machine learning algorithm that can be used for both classification and regression tasks. SVMs work by finding the optimal hyperplane that separates the data points into two classes. The optimal hyperplane is the one that maximizes the margin between the two classes. SVMs are particularly effective for high-dimensional data and for data that is not linearly separable. SVMs are implemented in various software packages, including Python (libsvm, svm-kernel), R (kernlab), and MATLAB (svmtrain, svmclassify). SVMs are a powerful tool for knowledge discovery and are widely used in many applications, including text classification, image classification, and bioinformatics.

Support Vector Machines (SVM) are a type of supervised machine learning algorithm that can be used for both classification and regression tasks. SVMs work by finding the optimal hyperplane that separates the data points into two classes. The optimal hyperplane is the one that maximizes the margin between the two classes. SVMs are particularly effective for high-dimensional data and for data that is not linearly separable. SVMs are implemented in various software packages, including Python (libsvm, svm-kernel), R (kernlab), and MATLAB (svmtrain, svmclassify). SVMs are a powerful tool for knowledge discovery and are widely used in many applications, including text classification, image classification, and bioinformatics.

2016-08-16

this work reviews the state of the art in svm and perceptron classifiers a support vector machine svm is easily the most popular tool for dealing with a variety of machine learning tasks including classification svms are associated with maximizing the margin between two classes the concerned optimization problem is a convex optimization guaranteeing a globally optimal solution the weight vector associated with svm is obtained by a linear combination of some of the boundary and noisy vectors further when the data are not linearly separable tuning the coefficient of the regularization term becomes crucial even though svms have popularized the kernel trick in most of the practical

applications that are high dimensional linear svms are popularly used the text examines applications to social and information networks the work also discusses another popular linear classifier the perceptron and compares its performance with that of the svm in different application areas

Support Vector Machines and Perceptrons

2021

support vector machines evolution and applications reviews the basics of support vector machines svm their evolution and applications in diverse fields svm is an efficient supervised learning approach popularly used for pattern recognition medical image classification face recognition and various other applications in the last 25 years a lot of research has been carried out to extend the use of svm to a variety of domains this book is an attempt to present the description of a conventional svm along with discussion of its different versions and recent application areas the first chapter of this book introduces svm and presents the optimization problems for a conventional svm another chapter discusses the journey of svm over a period of more than two decades svm is proposed as a separating hyperplane classifier that partitions the data belonging to two classes later on various versions of svm are proposed that obtain two hyperplanes instead of one a few of these variants of svm are discussed in this book the major part of this book discusses some interesting applications of svm in areas like quantitative diagnosis of rotor vibration process faults through power spectrum entropy based svm hardware architectures of svm applied in pattern recognition systems speaker recognition using svm classification of iron ore in mines and simultaneous prediction of the density and viscosity for the

ternary system water ethanol ethylene glycol ionic liquids the latter part of the book is dedicated to various approaches for the extension of svm and similar classifiers to a multi category framework so that they can be used for the classification of data with more than two classes

Support Vector Machines

2006

since the 1990s there has been significant activity in the theoretical development and applications of support vector machines svms the theory of svms is based on the cross pollenization of optimization theory statistical learning kernel theory and algorithmics so far machine learning has largely been devoted to solving problems relating to data mining text categorization and pattern facial recognition but not so much in the field of electromagnetics recently however popular binary machine learning algorithms including support vector machines svm have successfully been applied to wireless communication problems notably spread spectrum receiver design and channelequalization the aim of this book is to gently introduce support vector machines in its linear and non linear form both as regressors and as classifiers and to show how they can be applied to several antenna array processing problems and electromagnetics in general the lecture is divided into three main parts the first three chapters cover the theory of svms both as classifiers and regressors the next three chapters deal with applications in antenna array processing and other areas in electromagnetics the four appendices at the end of the book comprise the last part the inclusion of matlab files will help readers start their application of the algorithms covered in the book

dimensional analysis questions and answers (2023)

this book covers in the first part the theoretical aspects of support vector machines and their functionality and then based on the discussed concepts it explains how to find tune a support vector machine to yield highly accurate prediction results which are adaptable to any classification tasks the introductory part is extremely beneficial to someone new to learning support vector machines while the more advanced notions are useful for everyone who wants to understand the mathematics behind support vector machines and how to find tune them in order to generate the best predictive performance of a certain classification model

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2020-08-19

based on ideas from support vector machines svms learning to classify text using support vector machines presents a new approach to generating text classifiers from examples the approach combines high performance and efficiency with theoretical understanding and improved robustness in particular it is highly effective without greedy heuristic components the svm approach is computationally efficient in training and classification and it comes with a learning theory that can guide real world applications learning to classify text using support vector machines gives a complete and detailed description of the svm approach to learning text classifiers including training algorithms transductive text classification efficient performance estimation and a statistical learning model of text classification in addition it includes an overview of the field of text classification making it self contained even for newcomers to the field this book gives a concise introduction to svms for pattern

recognition and it includes a detailed description of how to formulate text classification tasks for machine learning

HOW TO FINE-TUNE SUPPORT VECTOR MACHINES FOR CLASSIFICATION

2012-12-06

this book contains select chapters on support vector algorithms from different perspectives including mathematical background properties of various kernel functions and several applications the main focus of this book is on orthogonal kernel functions and the properties of the classical kernel functions chebyshev legendre gegenbauer and jacobi are reviewed in some chapters moreover the fractional form of these kernel functions is introduced in the same chapters and for ease of use for these kernel functions a tutorial on a python package named orsvm is presented the book also exhibits a variety of applications for support vector algorithms and in addition to the classification these algorithms along with the introduced kernel functions are utilized for solving ordinary partial integro and fractional differential equations on the other hand nowadays the real time and big data applications of support vector algorithms are growing consequently the compute unified device architecture cuda parallelizing the procedure of support vector algorithms based on orthogonal kernel functions is presented the book sheds light on how to use support vector algorithms based on orthogonal kernel functions in different situations and gives a significant perspective to all machine learning and

scientific machine learning researchers all around the world to utilize fractional orthogonal kernel functions in their pattern recognition or scientific computing problems

Learning to Classify Text Using Support Vector Machines

2023-03-18

regularization optimization kernels and support vector machines offers a snapshot of the current state of the art of large scale machine learning providing a single multidisciplinary source for the latest research and advances in regularization sparsity compressed sensing convex and large scale optimization kernel methods and support vector machines consisting of 21 chapters authored by leading researchers in machine learning this comprehensive reference covers the relationship between support vector machines svms and the lasso discusses multi layer svms explores nonparametric feature selection basis pursuit methods and robust compressive sensing describes graph based regularization methods for single and multi task learning considers regularized methods for dictionary learning and portfolio selection addresses non negative matrix factorization examines low rank matrix and tensor based models presents advanced kernel methods for batch and online machine learning system identification domain adaptation and image processing tackles large scale algorithms including conditional gradient methods non convex proximal techniques and stochastic gradient descent regularization optimization kernels and support vector machines is ideal for researchers in machine learning pattern recognition data mining signal processing statistical learning and related areas

Learning with Fractional Orthogonal Kernel Classifiers in Support Vector Machines

2014-10-23

when discussing classification support vector machines are known to be a capable and efficient technique to learn and predict with high accuracy within a quick time frame yet their black box means to do so make the practical users quite circumspect about relying on it without much understanding of the how and why of its predictions the question raised in this book is how can this masked hero be made more comprehensible and friendly to the public provide a surrogate model for its hidden optimization engine replace the method completely or appoint a more friendly approach to tag along and offer the much desired explanations evolutionary algorithms can do all these and this book presents such possibilities of achieving high accuracy comprehensibility reasonable runtime as well as unconstrained performance

Regularization, Optimization, Kernels, and Support Vector Machines

2014-05-15

support vector machines svms represent a breakthrough in the theory of learning systems it is a new

generation of learning algorithms based on recent advances in statistical learning theory designed for the undergraduate students of computer science and engineering this book provides a comprehensive introduction to the state of the art algorithm and techniques in this field it covers most of the well known algorithms supplemented with code and data one class multiclass and hierarchical svms are included which will help the students to solve any pattern classification problems with ease and that too in excel key features extensive coverage of lagrangian duality and iterative methods for optimization separate chapters on kernel based spectral clustering text mining and other applications in computational linguistics and speech processing a chapter on latest sequential minimization algorithms and its modifications to do online learning step by step method of solving the svm based classification problem in excel kernel versions of pca cca and ica the cd accompanying the book includes animations on solving svm training problem in microsoft excel and by using svmlight software in addition matlab codes are given for all the formulations of svm along with the data sets mentioned in the exercise section of each chapter

Support Vector Machines and Evolutionary Algorithms for Classification

2009-02-02

this book constitutes the refereed proceedings of the first international workshop on pattern recognition with support vector machines svm 2002 held in niagara falls canada in august 2002 the

16 revised full papers and 14 poster papers presented together with two invited contributions were carefully reviewed and selected from 57 full paper submissions the papers presented span the whole range of topics in pattern recognition with support vector machines from computational theories to implementations and applications

Machine Learning with SVM and Other Kernel Methods

2002-07-29

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Pattern Recognition with Support Vector Machines

2007-08

a comprehensive introduction to this recent method for machine learning and data mining

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2014-05-14

support vector machines svm were introduced in the early 90 s as a novel nonlinear solution for

classification and regression tasks these techniques have been proved to have superior performances in a large variety of real world applications due to their generalization abilities and robustness against noise and interferences this book introduces a set of novel techniques based on svm that are applied to antenna array processing and electromagnetics in particular it introduces methods for linear and nonlinear beamforming and parameter design for arrays and electromagnetic applications

An Introduction to Support Vector Machines

2001

still searching for machine learning artificial intelligence algorithm designs make a statement in this i support vector machines tee makes a perfect gift for machine learning major artificial intelligence programming software engineer

Support Vector Machines in Data Mining

2022-06-01

Support Vector Machines for Antenna Array Processing and Electromagnetics

2019-12-20

I Support Vector Machine

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