Prediction Neural Network Using Matlab Thesis

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Modeling Solar Radiation at the Earth's Surface
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Predictive Analytics With Matlab Regression and Neural Networks
PREDICTIVE ANALYTICS WITH NEURAL NETWORKS USING MATLAB

Intelligent Reliability Analysis Using MATLAB and AI
Computer Neural Networks on MATLAB

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Fitting Functions, Recognizing Patterns, Clustering Data and Time Series Prediction with Neural Networks Using MATLAB CESAR PEREZ
MATLAB has the tool Deep Learning Toolbox that provides algorithms, functions, and apps to create, train, visualize, and simulate neural networks. You can perform classification, regression, clustering, dimensionality reduction, time-series forecasting, and dynamic system modeling and control. The toolbox includes convolutional neural network and autoencoder deep learning algorithms for image classification and feature learning tasks. To speed up training of large data sets (Big data), you can distribute computations and data across multicore processors, GPUs, and computer clusters using Parallel Computing Toolbox.
Neural Networks and Applications Using Matlab World Scientific
Solar radiation data is important for a wide range of applications, e.g. in engineering, agriculture, health sector, and in many fields of the natural sciences. A few examples showing the diversity of applications may include: architecture and building design, e.g. air conditioning and cooling systems; solar heating system design and use; solar power generation; evaporation and irrigation; calculation of water requirements for crops; monitoring plant growth and disease control; skin cancer research.
Modeling Solar Radiation at the Earth's Surface Packt Publishing Ltd
MACHINE AND DEEP LEARNING In-depth resource covering machine and deep learning methods using MATLAB tools and algorithms, providing insights and algorithmic decision-making processes Machine and Deep Learning Using MATLAB introduces early career professionals to the power of MATLAB to explore machine and deep learning applications by explaining the relevant MATLAB tool or app and how it is used for a given method or a collection of methods. Its properties, in terms of input and output arguments, are explained, the limitations or applicability is indicated via an accompanied text or a table, and a complete running example is shown with all needed MATLAB command prompt code. The text also presents the results, in the form of figures or tables, in parallel with the given MATLAB code, and the MATLAB written code can be later used as a template for trying to solve new cases or datasets. Throughout, the text features worked examples in each chapter for self-study with an accompanying website providing solutions and coding samples. Highlighted notes draw the attention of the user to critical points or issues. Readers will also find information on: Numeric data acquisition and analysis in the form of applying computational algorithms to predict the numeric data patterns (clustering or unsupervised learning) Relationships between predictors and response variable (supervised), categorically sub-divided into classification (discrete response) and regression (continuous response) Image acquisition and analysis in the form of applying one of neural networks, and estimating net accuracy, net loss, and/or RMSE for the successive training, validation, and testing steps Retraining and creation for image labeling, object identification, regression classification, and text recognition Machine and Deep Learning Using MATLAB is a useful and highly comprehensive resource on the subject for professionals, advanced students, and researchers who have some familiarity with MATLAB and are situated in engineering and scientific fields, who wish to gain mastery over the software and its numerous applications.
Artificial Intelligence with Python Createspace Independent Publishing Platform
MATLAB has the tool Neural Network Toolbox (Deep Learning Toolbox from version 18) that provides algorithms, functions, and apps to create, train, visualize, and simulate neural networks. You can perform classification, regression, clustering, dimensionality reduction, time-series forecasting, and dynamic system modeling and control.The toolbox includes convolutional neural network and autoencoder deep learning algorithms for image classification and feature learning tasks. To speed up training of large data sets, you can distribute computations and data across multicore processors, GPUs, and computer clusters using Parallel Computing Toolbox.This book develops, through examples, the possibilities of working with neural networks to model and predict with time series.
DEEP LEARNING with MATLAB. NEURAL NETWORKS by EXAMPLES Independently Published
Computer neural networks are a branch of artificial intelligence, inspired to behave in a manner similar to the human brain; they are trained and they learn from their training. Computer neural networks have a wide variety of applications, mostly hinged around modelling, forecasting, and general predictions. This book illustrates how to use computer neural networks on MATLAB in very simple and elegant manner. The language of the book is elementary as it is meant for beginners, readers are notassumed to have previous skills on the subject. Projects, in varying degrees, have been used to make sure that readers get a practical and hands-on experience on the subject. The book is meant for you if you want to get a quick start with the practical use of computer neural networks on MATLAB without the boredom associated with a lengthy theoretical write-up.
Artificial Neural Networks Applied For Digital Images with Matlab Code Diplomica Verlag
The availability of large volumes of data (Big Data) and the generalized use of computer tools has transformed research and data analysis, orienting it towards certain specialized techniques encompassed under the generic name of Analytics (Big Data Analytics) that includes Multivariate Data Analysis (MDA), Data Mining and other Business Intelligence techniques.Data Mining can be defined as a process of discovering new and significant relationships, patterns and trends when examining large amounts of data. The techniques of Data Mining pursue the automatic discovery of the knowledge contained in the information stored in an orderly manner in large databases. These techniques aim to discover patterns, profiles and trends through the analysis of data using advanced statistical techniques of multivariate data analysis.The goal is to allow the researcher-analyst to find a useful solution to the problem raised through a better understanding of the existing data.Data Mining uses two types of techniques: predictive techniques, which trains a model on known input and output data so that it can predict future outputs, and descriptive techniques, which finds hidden patterns or intrinsic structures in input data.
DATA MINING and BIG DATA ANALYTICS with NEURAL NETWORKS Using MATLAB

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Predictive analytics encompasses a variety of statistical techniques from predictive modeling, machine learning, and data mining that analyze current and historical facts to make predictions about future or otherwise unknown events. Different work fields with neural networks and predictive analytics techniques are listed below: The multilayer perceptron (MLP), A radial basis function (RBF), Support vector machines (SVM), Fit regression models with neural networks, Time series neural networks, Hopfield and linear neural networks, Generalized regression and LVQ neural networks, Adaptative linear filters and non linear problems

TIME SERIES FORECASTING USING NEURAL NETWORKS. EXAMPLES WITH MATLAB
Independently Published
How to minimize the global problem of e-waste KEY FEATURES ● Explore core concepts of Reliability Analysis, various smart models, different electronic components, and practical use of MATLAB. ● Cutting edge coverage on building intelligent systems for reliability analysis. ● Includes numerous techniques and methods to identify failure and reliability parameters. DESCRIPTION Intelligent Reliability Analysis using MATLAB and AI explains a roadmap to analyze and predict various electronic components' future life and performance reliability. Deeply narrated and authored by reliability experts, this book empowers the reader to deepen their understanding of reliability identification, its significance, preventive measures, and various techniques. The book teaches how to predict the residual lifetime of active and passive components using an interesting use case on electronic waste. The book will demonstrate how the capacity of re-usability of electronic components can benefit the consumer to reuse the same component, with the confidence of successful operations. It lists key attributes and ways to design experiments using Taguchi's approach, based on various acceleration factors. This book makes it easier for readers to understand reliability modeling of active and passive components using the Artificial Neural Network, Fuzzy Logic, Adaptive Neuro-Fuzzy Inference System (ANFIS). The book keeps you engaged with a systematic and detailed explanation of step-wise MATLAB-based implementation of electronic components. These explanations and illustrations will help the readers to predict fault and failure well before time. WHAT YOU WILL LEARN ● Optimize various acceleration factors for exploring the residual life of components experimentally. ● Design an intelligent model to predict the upcoming faults and failures of electronic components and make provision for timely replacement of the fault components. ● Design experiments using Taguchi's approach. ● Understand reliability modeling of active and passive components using the Artificial Neural Network and Fuzzy Logic. WHO THIS BOOK IS FOR This book is for current and aspiring emerging tech professionals, researchers, students, and anyone who wishes to understand and diagnose the product life of electronic components using the power of artificial intelligence and various experimental techniques. TABLE OF CONTENTS 1. RELIABILITY FUNDAMENTALS 2. RELIABILITY MEASURES 3. REMAINING USEFUL LIFETIME ESTIMATION TECHNIQUES 4. INTELLIGENT MODELS FOR RELIABILITY PREDICTION 5. ACCELERATED LIFE TESTING 6. EXPERIMENTAL TESTING OF ACTIVE AND PASSIVE COMPONENTS 7. INTELLIGENT MODELING FOR RELIABILITY ASSESSMENT USING MATLAB

Predictive Analytics with Matlab. Machine Learning Techniques OTexts
Predictive analytics encompasses a variety of statistical techniques from predictive modeling, machine learning, and data mining that analyze current and historical facts to make predictions about future or otherwise unknown events. In business, predictive models exploit patterns found in historical and transactional data to identify risks and opportunities. Models capture relationships among many factors to allow assessment of risk or potential associated with a particular set of conditions, guiding decision making for candidate transactions. The defining functional effect of these technical approaches is that predictive analytics provides a predictive score (probability) for each individual (customer, employee, healthcare patient, product SKU, vehicle, component, machine, or other organizational unit) in order to determine, inform, or influence organizational processes that pertain across large numbers of individuals, such as in marketing, credit risk assessment, fraud detection, manufacturing, healthcare, and government operations including law enforcement. Predictive analytics is used in actuarial science, marketing, financial services, insurance, telecommunications, retail, travel, healthcare, child protection, pharmaceuticals, capacity planning and other fields. One of the best-known applications is credit scoring, which is used throughout financial services. Scoring models process a customer's credit history, loan application, customer data, etc., in order to rank-order individuals by their likelihood of making future credit payments on time. Neural networks are nonlinear sophisticated modeling techniques that are able to model complex functions. They can be applied to problems of prediction, classification or control in a wide spectrum of fields such as finance, cognitive psychology/neuroscience, medicine, engineering, and physics. Neural networks are used when the exact nature of the relationship between inputs and output is not known. A key feature of neural networks is that they learn the relationship between inputs and output through training. There are three types of training used by different neural networks: supervised and unsupervised training and reinforcement learning, with supervised being the most common one. Some examples of neural network training techniques are backpropagation, quick propagation, conjugate gradient descent, projection operator, Delta-Bar-Delta etc. Some unsupervised network architectures are multilayer perceptrons, Kohonen networks, Hopfield networks, etc. Different work fields with neural networks and predictive analytics techniques are developed in this book: -The multilayer perceptron (MLP) -A radial basis function (RBF) i -Fit regression models with neural networks. -Time series neural networks. Modeling and prediction with NARX and time delay networks. -Hopfield and linear neural networks. -Generalized regression and LVQ neural networks. -Adaptative linear filters and non linear problems. Used for linear and nonlinear prediction

Neural Networks Time Series Using Matlab Apress
Deep learning Toolbox includes a variety of functions related to the creation, training and prediction of working with neural networks. It also includes tools that facilitate work through menus that alleviate code development. This book relates alphabetically the mentioned functions and tools to facilitate easy work in MATLAB, either using code or using tools that implement menus.

Neural Networks Using Matlab, Function Approximation and Regression Createspace Independent Publishing Platform
Guide covering topics from machine learning, regression models, neural network to tensor flow DESCRIPTION Machine learning is mostly sought in the research field and has become an integral part of many research projects nowadays including commercial applications, as well as academic

research. Application of machine learning ranges from finding friends on social networking sites to medical diagnosis and even satellite processing. In this book, we have made an honest effort to make the concepts of machine learning easy and give basic programs in MATLAB right from the installation part. Although the real-time application of machine learning is endless, however, the basic concepts and algorithms are discussed using MATLAB language so that not only graduation students but also researchers are benefitted from it. KEY FEATURES Machine learning in MATLAB using basic concepts and algorithms. Deriving and accessing of data in MATLAB and next, pre-processing and preparation of data. Machine learning workflow for health monitoring. The neural network domain and implementation in MATLAB with explicit explanation of code and results. How predictive model can be improved using MATLAB? MATLAB code for an algorithm implementation, rather than for mathematical formula. Machine learning workflow for health monitoring. WHAT WILL YOU LEARN Pre-requisites to machine learning Finding natural patterns in data Building classification methods Data pre-processing in Python Building regression models Creating neural networks Deep learning WHO THIS BOOK IS FOR The book is basically meant for graduate and research students who find the algorithms of machine learning difficult to implement. We have touched all basic algorithms of machine learning in detail with a practical approach. Primarily, beginners will find this book more effective as the chapters are subdivided in a manner that they find the building and implementation of algorithms in MATLAB interesting and easy at the same time. Table of Contents _1. Ê Ê Pre-requisite to Machine Learning 2. Ê Ê An introduction to Machine Learning 3. Ê Ê Finding Natural Patterns in Data 4. Ê Ê Building Classification Methods 5. Ê Ê Data Pre-Processing in Python 6. Ê Ê Building Regression Models 7. Ê Ê Creating Neural Networks 8. Ê Ê Introduction to Deep Learning

Neural Networks for Identification, Prediction and Control Createspace Independent Publishing Platform

Get started with MATLAB for deep learning and AI with this in-depth primer. In this book, you start with machine learning fundamentals, then move on to neural networks, deep learning, and then convolutional neural networks. In a blend of fundamentals and applications, MATLAB Deep Learning employs MATLAB as the underlying programming language and tool for the examples and case studies in this book. With this book, you'll be able to tackle some of today's real world big data, smart bots, and other complex data problems. You'll see how deep learning is a complex and more intelligent aspect of machine learning for modern smart data analysis and usage. What You'll Learn Use MATLAB for deep learning Discover neural networks and multi-layer neural networks Work with convolution and pooling layers Build a MNIST example with these layers Who This Book Is For Those who want to learn deep learning using MATLAB. Some MATLAB experience may be useful.

PREDICTIVE ANALYTICS with NEURAL NETWORKS Using MATLAB Createspace Independent Publishing Platform

The subject of this book is predictive modular neural networks and their ap plication to time series problems: classification, prediction and identification. The intended audience is researchers and graduate students in the fields of neural networks, computer science, statistical pattern recognition, statistics, control theory and econometrics. Biologists, neurophysiologists and medical engineers may also find this book interesting. In the last decade the neural networks community has shown intense interest in both modular methods and time series problems. Similar interest has been expressed for many years in other fields as well, most notably in statistics, control theory, econometrics etc. There is a considerable overlap (not always recognized) of ideas and methods between these fields. Modular neural networks come by many other names, for instance multiple models, local models and mixtures of experts. The basic idea is to independently develop several "subnetworks" (modules), which may perform the same or re lated tasks, and then use an "appropriate" method for combining the outputs of the subnetworks. Some of the expected advantages of this approach (when compared with the use of "lumped" or "monolithic" networks) are: superior performance, reduced development time and greater flexibility. For instance, if a module is removed from the network and replaced by a new module (which may perform the same task more efficiently), it should not be necessary to retrain the aggregate network.

Prediction of Burnout BPB Publications

This Study about burnout in nurses takes a different approach than all prior empirical work on this topic given that nonlinear relationships between job stressors, personal factors and the three burnout dimensions are investigated using artificial neural networks, a type of computer simulation that is especially well suited to capturing nonlinearities in data. The burnout process is related to organizational, personal, interpersonal, social, and cultural variables and these relationships are not exclusively linear. Due to this nonlinearity, hierarchical stepwise multiple regression or other linear statistical methods, may perhaps not be the most suitable method to analyze the data effectively. Compounding the dilemma is that multiple linear regression returns no direct indicator with regard to whether the data is best portrayed linearly. In standard least squares linear regression, the model has to be specified previously and assumptions have to be made concerning the underlying relationship between independent variables and dependent variables. Since by default, the relationship is often assumed to be linear, the regression line can be erroneous even though the error of the fit can be small. Artificial neural networks do not have these limitations with nonlinearities and are therefore predestined for the analysis of nonlinear relationships.This study is a complex research of burnout that includes socio-demographic characteristics, job stressors, and hardy personality. Typically, studies on burnout have investigated primarily the effects of organizational factors. Recently, authors revealed and confirmed the important effects of personality variables on the burnout process.The objective of developing an instrument to predict burnout (NuBuNet abbreviation for Nursing Burnout Network) in nurses is accomplished by using two different types of artificial neural networks: A three-layer feed-forward network with the gradient decent back-propagation training algorithm and a radial basis function network with two different training algorithms: the pseudo inverse algorithm and a hybrid algorithm. The implementation of the artificial neural networks used in this study is carried out in a MATLAB development environment. Instead of writing each artificial neural network as a stand-alone program, an object-oriented programming style is chosen to include all functions into one single system. Three artificial neural networks are implemented in the technical part of this study. A self-organizing map, a three-layer back-propagation network, and a radial basis function network. Whereas the self-organizing map is only used in the data preparation process, the back-propagation network and the radial basis function network is used in the burnout model approximation.After an exhaustive training and

simulation session including more than 150 networks and an analysis of all results, the network with the best results is chosen to be compared to the hierarchical stepwise multiple regression.The network paradigms are better suited for the analysis of burnout than hierarchical stepwise multiple regression. Both can capture nonlinear relationships that are relevant for theory development. At predicting the three burnout sub-dimensions emotional exhaustion, depersonalization, and lack of personal accomplishment however, the radial basis function network is slightly better than the three-layer feed-forward network.

MATLAB Deep Learning Createspace Independent Publishing Platform

In recent years, there has been a growing interest in applying neural networks to dynamic systems identification (modelling), prediction and control. Neural networks are computing systems characterised by the ability to learn from examples rather than having to be programmed in a conventional sense. Their use enables the behaviour of complex systems to be modelled and predicted and accurate control to be achieved through training, without a priori information about the systems' structures or parameters. This book describes examples of applications of neural networks In modelling, prediction and control. The topics covered include identification of general linear and non-linear processes, forecasting of river levels, stock market prices and currency exchange rates, and control of a time-delayed plant and a two-joint robot. These applications employ the major types of neural networks and learning algorithms. The neural network types considered in detail are the muhilayer perceptron (MLP), the Elman and Jordan networks and the Group-Method-of-Data-Handling (GMDH) network. In addition, cerebellar-model-articulation-controller (CMAC) networks and neuromorphic fuzzy logic systems are also presented. The main learning algorithm adopted in the applications is the standard backpropagation (BP) algorithm. Widrow-Hoff learning, dynamic BP and evolutionary learning are also described.

Predictive Analytics With Neural Networks Using Matlab Springer Science & Business Media

Harness the power of MATLAB for deep-learning challenges. Practical MATLAB Deep Learning, Second Edition, remains a one-of a-kind book that provides an introduction to deep learning and using MATLAB's deep-learning toolboxes. In this book, you'll see how these toolboxes provide the complete set of functions needed to implement all aspects of deep learning. This edition includes new and expanded projects, and covers generative deep learning and reinforcement learning. Over the course of the book, you'll learn to model complex systems and apply deep learning to problems in those areas. Applications include: Aircraft navigation An aircraft that lands on Titan, the moon of Saturn, using reinforcement learning Stock market prediction Natural language processing Music creation usng generative deep learning Plasma control Earth sensor processing for spacecraft MATLAB Bluetooth data acquisition applied to dance physics What You Will Learn Explore deep learning using MATLAB and compare it to algorithms Write a deep learning function in MATLAB and train it with examples Use MATLAB toolboxes related to deep learning Implement tokamak disruption prediction Now includes reinforcement learning Who This Book Is For Engineers, data scientists, and students wanting a book rich in examples on deep learning using MATLAB.

Neural Networks in Finance Createspace Independent Publishing Platform

Build real-world Artificial Intelligence applications with Python to intelligently interact with the world around you About This Book Step into the amazing world of intelligent apps using this comprehensive guide Enter the world of Artificial Intelligence, explore it, and create your own applications Work through simple yet insightful examples that will get you up and running with Artificial Intelligence in no time Who This Book Is For This book is for Python developers who want to build real-world Artificial Intelligence applications. This book is friendly to Python beginners, but being familiar with Python would be useful to play around with the code. It will also be useful for experienced Python programmers who are looking to use Artificial Intelligence techniques in their existing technology stacks. What You Will Learn Realize different classification and regression techniques Understand the concept of clustering and how to use it to automatically segment data See how to build an intelligent recommender system Understand logic programming and how to use it Build automatic speech recognition systems Understand the basics of heuristic search and genetic programming Develop games using Artificial Intelligence Learn how reinforcement learning works Discover how to build intelligent applications centered on images, text, and time series data See how to use deep learning algorithms and build applications based on it In Detail Artificial Intelligence is becoming increasingly relevant in the modern world where everything is driven by technology and data. It is used extensively across many fields such as search engines, image recognition, robotics, finance, and so on. We will explore various real-world scenarios in this book and you'll learn about various algorithms that can be used to build Artificial Intelligence applications. During the course of this book, you will find out how to make informed decisions about what algorithms to use in a given context. Starting from the basics of Artificial Intelligence, you will learn how to develop various building blocks using different data mining techniques. You will see how to implement different algorithms to get the best possible results, and will understand how to apply them to real-world scenarios. If you want to add an intelligence layer to any application that's based on images, text, stock market, or some other form of data, this exciting book on Artificial Intelligence will definitely be your guide! Style and approach This highly practical book will show you how to implement Artificial Intelligence. The book provides multiple examples enabling you to create smart applications to meet the needs of your organization. In every chapter, we explain an algorithm, implement it, and then build a smart application.

Machine and Deep Learning Using MATLAB Springer Science & Business Media

Big data analytics is the process of collecting, organizing and analyzing large sets of data (called big data) to discover patterns and other useful information. Big data analytics can help organizations to better understand the information contained within the data and will also help identify the data that is most important to the business and future business decisions. Analysts working with big data basically want the knowledge that comes from analyzing the data.To analyze such a large volume of data, big data analytics is typically performed using specialized software tools and applications for predictive analytics, data mining, text mining, forecasting and data optimization. Collectively these processes are separate but highly integrated functions of high-performance analytics. Using big data tools and software enables an organization to process extremely large volumes of data that a business has collected to determine which data is relevant and can be analyzed to drive better business decisions in the future. Among all these tools highlights MATLAB.MATLAB implements various toolboxes for working on big data analytics, such as Statistics Toolbox and Neural Network Toolbox (Deep Learning Toolbox for version 18) . This book develops the work capabilities of

MATLAB with neural networks.

Financial Prediction Using Neural Networks Academic Press

MATLAB has the tool Deep Leraning Toolbox that provides algorithms, functions, and apps to create, train, visualize, and simulate neural networks. You can perform classification, regression, clustering, dimensionality reduction, timeseries forecasting, and dynamic system modeling and control.

Dynamic neural networks are good at timeseries prediction. You can use the Neural Net Time Series app to solve different kinds of time series problems It is generally best to start with the GUI, and then to use the GUI to automatically generate command line scripts. Before using either method, the first step is to define the problem by selecting a data set. Each GUI has access to many sample data sets that you can use to experiment with the toolbox. If you have a specific problem that you want to solve, you can load your own data into the workspace. With MATLAB is possibe to solve three different kinds of time series problems. In the first type of time series problem, you would like to predict future values of a time series y(t) from past values of that time series and past values of a second time series x(t). This form of prediction is called nonlinear autoregressive network with exogenous (external) input, or NARX. In the second type of time series problem, there is only one series involved. The future values of a time series y(t) are predicted only from past values of that series. This form of prediction is called nonlinear autoregressive, or NAR. The third time series problem is similar to the first type, in that two series are involved, an input series (predictors) x(t) and an output series (responses) y(t). Here you want to predict values of y(t) from previous values of x(t), but without knowledge of previous values of y(t). This book develops methods for time series forecasting using neural networks across MATLAB

Predictive Modular Neural Networks Createspace Independent Publishing Platform

Predictive analytics is an area of statistics that deals with extracting information from data and using it to predict trends and behavior patterns. Often the unknown event of interest is in the future, but predictive analytics can be applied to any type of unknown whether it be in the past, present or future. For example, identifying suspects after a crime has been committed, or credit card fraud as it occurs. The core of predictive analytics relies on capturing relationships between explanatory variables and the predicted variables from past occurrences, and exploiting them to predict the unknown outcome. It is important to note, however, that the accuracy and usability of results will depend greatly on the level of data analysis and the quality of assumptions. This books develops the important predictive models like Support Vector Machine, Nearest Neighbors. KNN Classifiers, Support Vector Machine Regression, Gaussian Process Regresion, Classification and Regression Trees, Regression Models with Neural Networks, Neural Networks Time Series Prediction and Classification with Naive Bayes.