

BUSTA 3

- Si discutano le problematiche relative alla gestione delle sessioni, eventualmente in riferimento ad un linguaggio di programmazione per il web lato server a scelta
- Si illustri il ruolo di un hypervisor in un sistema di virtualizzazione, eventualmente illustrando in particolare un esempio applicativo.
- Si descrivano, nell'ambito del sistema universitario, il ruolo e le funzioni del Consiglio di Amministrazione.

Accertamento abilità informatiche:

- Dato un foglio di calcolo vuoto, creare una tabella per il dettaglio di una fattura, in cui sulla prima colonna sono presenti le quantità, nella seconda i prezzi unitari e nella terza devono essere calcolati i prezzi totali per riga.

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Data Extraction and Exploration Tools for Business Intelligence



Mário Cardoso, Tiago Guimarães, Carlos Filipe Portela
and Manuel Filipe Santos

Abstract Business intelligence (BI) has undergone constant changes currently, due to the increasing emergence of new technologies, which are introduced to improve the processes inherent in decision-making in organizations. However, not all users are familiar with the tools of a typical BI system, so there is a heavy reliance on the assistance of information technology (IT) technicians in the area of data extraction and exploitation (DEE), for ad hoc analyses. In this article, we intend to analyze some DEE tools on the market and their applicability to resolve and help these user's issues in their work environment. For this purpose, literature survey of these type of users and their requirements was done; six DEE tools were selected, analyzed, and experimented; a topology was defined to evaluate the DEE tools in order to identify the one that best applies to business data extraction and exploitation from data warehouses and data marts, associated with BI system and responds to the requirements of these users.

Keywords Business intelligence · Data analytics · Data extraction · Data exploration

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ESTRATTA

BUSTA 4

- Si descrivano le caratteristiche dei sistemi LDAP e le loro principali applicazioni
- Si descrivano le porte utilizzate dai principali protocolli e servizi della rete internet, eventualmente descrivendo nello specifico uno di tali protocolli o servizi.
- Si descrivano, nell'ambito del sistema universitario, il ruolo e le funzioni del Senato Accademico.

Accertamento abilità informatiche:

- Dato un foglio di calcolo, si scriva nella cella B1 una formula che calcola il massimo dei tutti i valori presenti nelle celle A1, A2, A3.

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Outlier Detection Method-Based KPCA for Water Pipeline in Wireless Sensor Networks



Mohammed Aseeri, Oussama Ghorbel, Hamoud Alshammari,
Ahmed Alabdullah and Mohamed Abid

Abstract Water is considered as the most important resource in our life. Pipelines are considered as very important solution to transport water. So, due to the existence of the harsh environmental condition, different detection ways are not great to monitor pipelines. Therefore, all used systems need to be improved to become more efficient. For this reason, wireless sensor networks (WSNs) are used in water pipeline field. This latter are employed to solve different problems. In this paper, the low-cost damage detection technique for outlier is provided to discuss the task amounts. Our proposed solution uses kernel principal component analysis (KPCA). We aim at analyzing the nature of information. Determine if it is normal or abnormal to help to identify specific events in WSN field for water pipeline. Using real data collected from different stations in WSNs, this solution shows a higher performance in finding abnormal data.

Keywords Outlier detection method · Wireless sensor networks · Data classification · Kernel principal component analysis · Feature extraction

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ESTRATTA

BUSTA 5

- Si descrivano i principali comandi del linguaggio SQL.
- Si descriva il ruolo e il funzionamento di un firewall hardware e/o software.
- Si descrivano, nell'ambito del sistema universitario, il ruolo e le funzioni del DPO (Data Protection Officer).

Accertamento abilità informatiche:

- Dato un foglio di calcolo, si scrivano nella celle della colonna B (da B1 a B20) le formule che calcolino il doppio dei numeri presenti nella colonna A della stessa riga.

Deep Learning Approach for IDS

Using DNN for Network Anomaly Detection



Zhiqiang Liu, Mohi-Ud-Din Ghulam, Ye Zhu, Xuanlin Yan, Lifang Wang, Zejun Jiang and Jianchao Luo

Abstract With the astonishing development of the Internet and its applications in the last decade, cyberattacks are changing quickly, and the necessity of protection for communication network has improved tremendously. As the primary defense, the intrusion detection system plays a crucial role in making sure the network security. Key to intrusion detection system is actually to determine a variety of attacks effectively as well as to adjust to a constantly changing threat scenario. DNN or Deep Neural Network on NSL-KDD dataset for effective detection of an attack. Firstly, the dataset was preprocessed and normalized and then fed to the DNN algorithm to create a model. For testing purpose, entire dataset of NSL-KDD was used. Finally, to analyze the accuracy and precision of the DNN model, we use accuracy and precision matrices. The proposed DNN-based strategy enhances network anomaly detection and opens new analysis gateway for intrusion detection systems.

Keywords Deep learning · DNN · Intrusion detection system · Network security

1 Introduction

Together with the progressively in-depth amalgamation of social life and the Internet, the Web is changing how people learn and work, though additionally, it exposes us to progressively powerful security threats. Cybersecurity is a pair of processes and technologies created to safeguard computers, networks, data, and programs from unauthorized access and attacks, modification, and obliteration. A substantial research milestone in the information security area is the intrusion detection system. It can quickly determine an intrusion, which may be a continuing intrusion or may be an intrusion which has currently transpired. Involving the critical difficulties in cybersecurity will be the provision of an effective and robust intrusion detection system. The way you can identify many network attacks, mainly not earlier seen attack types, is a crucial issue being resolved urgently.

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BUSTA 6

- Si descrivano le caratteristiche principali di una Active Directory, eventualmente illustrandone uno o più campi di applicazione.
- Si descriva un possibile attacco informatico attuabile da remoto, evidenziando eventuali strategie o soluzioni per la mitigazione del suo rischio.
- Si illustri cosa è un regolamento di Ateneo.

Accertamento abilità informatiche:

- Dato un foglio di calcolo, si scriva nella cella B1 una formula che calcola la somma di tutti i valori presenti nelle celle A1, A2, A3, ..., A20.

Bridges Strengthening by Conversion to Tied-Arch Using Monarch Butterfly Optimization



Orlando Gardella, Broderick Crawford, Ricardo Soto, José Lemus-Romani, Gino Astorga and Agustín Salas-Fernández

Abstract The problem existing in bridges that collapse due to undermining of the piers that sustain it, as well as collapses due to hydraulic action, generate high costs that can be reduced, making the repair of its structures. It is possible to reinforce them by modification, incorporating cable-stayed arches, and tensioning of hangers to support them. In this paper, a new approach is presented to solve the problem effectively, using a modern metaheuristic based on nature called monarch butterfly optimization it works imitating the way of migration, who uses the monarch butterflies. The results obtained are compared with those provided by black hole algorithm through the use of a known statistical test.

Keywords Reinforcement of bridges · Metaheuristics · Optimization · Monarch butterfly optimization · Combinatorial optimization

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BUSTA 1

- Si scelga un linguaggio (tra PHP, Java, Javascript e Python) e se ne descrivano le principali caratteristiche.
- Si descrivano il ruolo, il funzionamento e gli utilizzi del Domain Name System.
- Si descrivano, nell'ambito del sistema universitario, il ruolo e le funzioni del Rettore.

Accertamento abilità informatiche:

- Dato un foglio di calcolo in cui la colonna A contiene valori non negativi, si scrivano nella celle della colonna B (da B1 a B10) le formule che calcolino la percentuale del valore presente nella colonna A della stessa riga rispetto alla somma totale di tutti i valori della colonna A (da A1 a A10).

Closest Fit Approach Through Linear Interpolation to Recover Missing Values in Data Mining



Sanjay Gaur, Darshanaben D. Pandya and Deepika Soni

Abstract Data in the dataset is always remaining as the basic building blocks for any query and further task and decisions. If basis data is incomplete or dataset have missing values then one cannot assume about well up to date final reports. In data mining, missing values recognition and recovery is still major issue with irregular data. To overcome from such situation, there is need of statistical or numerical techniques to recover the missing values in the dataset. Missing values in the dataset or database always cause of ambiguity and its affects final results, accuracy of query and reduce decision-making capacity. The present paper is an attempt to recover missing values using closest fit approach through linear interpolation. There is application of the concept of linear approach is used to recover the missing values.

Keywords Data mining · Attribute · Missing values · Closest fit · Approach

1 Introduction

In general, all the reports and queries are performed by the help of database. Data in the database remains in the tabular form, or we can say that in the form of dataset. Dataset are basically attributes of the concern relation, whereas the record set is combination of various fields. It is clear that data in the dataset remains as basic facts and these are used for any query and further task and decisions. Due to various reasons, sometimes there is unavailability of complete data in the dataset. If dataset is incomplete or dataset have missing values, it directly affects the final reports. In data mining, missing values recognition and recovery are still most important

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NON ESTRATTA

BUSTA 2

- Si illustrino le caratteristiche di un sistema di virtualizzazione basato su container, eventualmente illustrando un esempio applicativo.
- Si descrivano i principali protocolli utilizzati per la posta elettronica.
- Si descrivano, nell'ambito del sistema universitario, il ruolo e le funzioni del Direttore Generale.

Accertamento abilità informatiche:

- Dato un foglio di calcolo, si scriva nella cella B1 una formula che calcola la media dei valori presenti nelle celle A1, A2, A3.

Systems and Methods for Implementing Deterministic Finite Automata (DFA) via a Blockchain



Craig S. Wright

Abstract We present a novel technology for the establishment and (discretionary) automatic execution of (financial) contracts based on the realisation of the commitments of the different parties, and other clauses and provisions, as a non-deterministic finite automaton (NFA) embodied in a computational and record-keeping structure on the (Bitcoin) blockchain. In particular, the process provides methods for constructing non-deterministic finite-state automata in Bitcoin script. The “best” method produces a one-to-one relation between the definition and the state table of the automaton.

Keywords Automata · DFA · Computation · Bitcoin · Blockchain

1 Introduction

The automation of (financial) contracts has been a topic of continued academic research (see, e.g., [1] and references therein) and practical interest since the realisation that an electronic version of the essence of such contracts can be better defined (e.g. avoiding ambiguities and interpretations of current legalese as well as potentially costly and long litigations) and executable and enforceable by computers, and consequently cheaper and more reliable.

Among the different approaches which have been proposed in the literature (see Chap. 1 of [1] for a short review), it has been shown that a deterministic finite automata (DFA), also known as deterministic finite-state machines, have a rich enough structure to represent a wide range (if not all) of imaginable financial agreements, and other kinds of contracts [2, 3].

A DFA is a mathematical model of computation conceived as an abstract machine that can be in one of a finite set of states and can change from one state to another (transition) when a triggering event or condition occurs. Its computational capabilities are more than those of combinational logic but less than those of a stack machine.

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