



ICDSAIA

International Conference on

DATA SCIENCE, AI AND ANALYTICS: BRIDGING THE GAP BETWEEN THEORY AND PRACTICES

13th and 14th September 2023 | Taylor's University, Malaysia

Organized By

School of Computer Science, Taylor's University, Malaysia.

&

Institute For Engineering Research and Publication (IFERP) Malaysia Chapter

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PREFACE

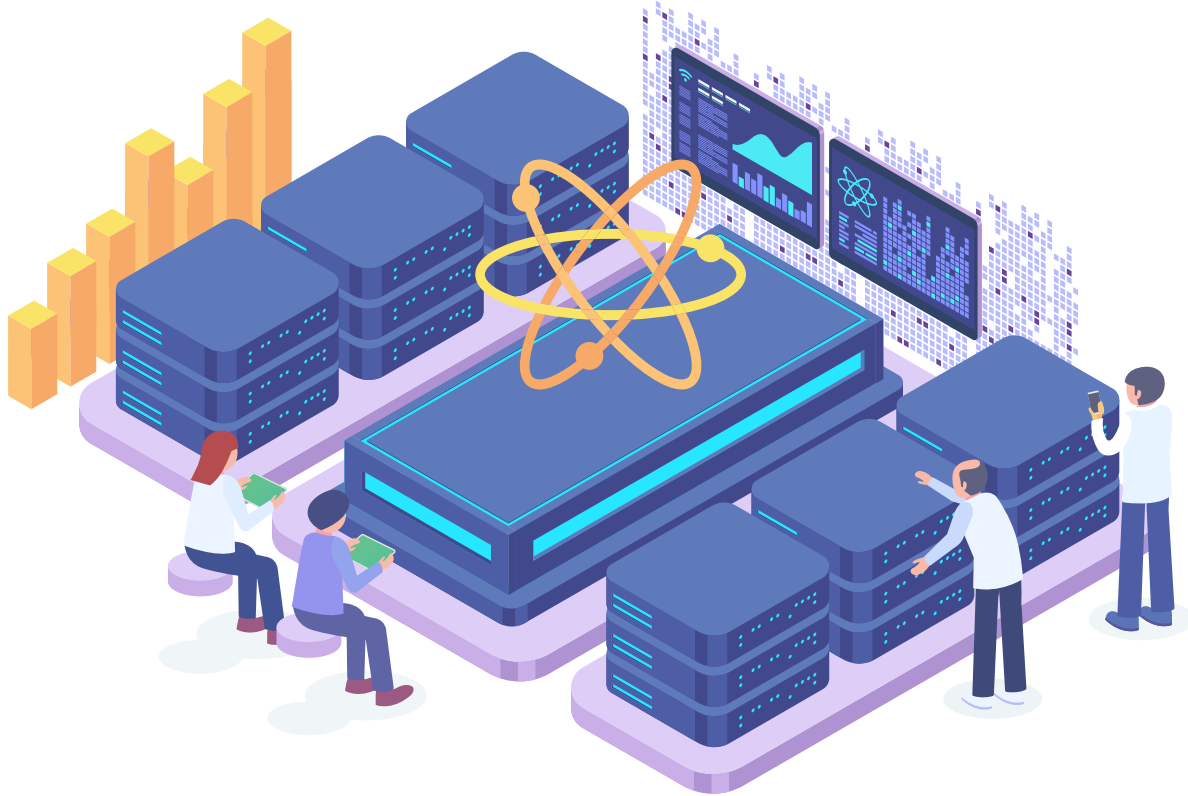
The International Conference on Data Science, AI and Analytics: Bridging the Gap Between Theory and Practices (ICDSAIA-2023) is being organized by Taylor' University and Institute For Engineering Research and Publication (IFERP) - Malaysia Society also in association with LJ University - India, Universiti Teknologi MARA - Malaysia, Albhukary International University - Malaysia and in partnership with Malaysia Digital Economy Corporation (MDEC) in Taylor's University on the 13th & 14th September, 2023. The ICDSAIA-2023 is a notable event which brings Academicians, Researchers, Engineers, Industry Experts and Students together. The purpose of this conference is to discuss applications and development in the area of "Data Science, AI and Analytics" which were given international values by Institute For Engineering Research and Publication (IFERP).

The International Conference attracted over 120+ submissions. Through rigorous peer reviews 50+ high quality papers were recommended by the Committee. The Conference aptly focuses on the tools and techniques for the developments on Data Science, AI and Analytics. We are indebted to the efforts of all the reviewers who undoubtedly have raised the quality of the proceedings.

We are earnestly thankful to all the authors who have contributed their research works to the conference. We thank our Management for their wholehearted support and encouragement. We thank our principal for his continuous guidance. We are also thankful for the cooperative advice from our advisory Chairs and Co-Chairs. We thank all the members of our local Organizing Committee, National and International Advisory Committees.



Theme of the Conference



BRIDGING THE GAP: UNLEASHING THE POWER OF DATA SCIENCE, AI, AND ANALYTICS IN REAL-WORLD APPLICATIONS

Message from **Managing Director**

Mr. Siddh Kumar Chhajer

Managing Director & Founder

Institute For Engineering Research and Publication
(IFERP)

On behalf of IFERP & the organizing Committee, I express my hearty gratitude to the participants, keynote speakers, delegates, reviewers and researchers.

The goal of the ICDSAIA 2023 is to provide knowledge enrichment and innovative technical exchange between international researchers or scholars and practitioners from academia and industries in the field of Data Science, AI and Analytics. ICDSAIA provides a world class stage to the Researchers, Professionals, Scientists, Academicians, and students to engage in very challenging conversations, assess the current body of research and determine knowledge and capability gaps.

ICDSAIA 2023 will explore the new horizons of innovations from distinguished researchers, scientists and eminent authors in academia and industry working for the advancements in Data Science, AI and Analytics from all over the world. ICDSAIA hopes to set the perfect platform for participants to establish careers as successful and globally renowned specialists in Data Science, AI and Analytics.



A. Siddh Kumar Chhajer



Message from Chief Executive Officer

Mr. Rudra Bhanu Satpathy

Chief Executive Officer (CEO) & Founder
Institute For Engineering Research and
Publication (IFERP)

IFERP is hosting the International Conference on Data Science, AI and Analytics: Bridging the Gap Between Theory and Practices (ICDSAIA-2023) this year in the month of September. The main objective of ICDSAIA 2023 is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points, and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The sessions serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader.

I express my hearty gratitude to all my Colleagues, staff, Professors, reviewers and members of the organizing committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their painstaking effort to make this conference successful.



Mr. Rudra Bhanu Satpathy



Guest of Honor



Dr. Azman bin Hussin

Special Task Officer,
Minister of Home Affairs Office
Malaysia

Azman Hussin is a continual learner of data science. He likes to use R, tidyverse, tidymodels, and text analytics.

He studied Physics in university many years ago but mainly worked in the IT industry. He then took up work in training and consulting on strategy management and completed his doctorate in that field. He has written a few books. He publishes some of his work on R at <https://rpubs.com/azmanH>. He also invests in listed technology companies. On Covid, he is a curious citizen who wants to get a sense of the prevalence of Covid through data so he can separate facts from opinions.

He is currently the Special Task Officer for the Minister of Home Affairs and he was the 6th CEO of Companies Commission of Malaysia

International conference on

Data Science, AI and Analytics: Bridging the Gap Between Theory and Practices



Hybrid Conference | 13th and 14th September 2023



Keynote & Session Speakers

Keynote Speakers



Prof. Dr. Tarik A. Rashid

Professor in Computer Science/Artificial Intelligence,
 Director of the Centre for Artificial Intelligence and Innovation
 Dean of the School of Science and Engineering
 University of Kurdistan Hewler, Iraq.

Tarik Ahmed Rashid is a Member of IEEE, ACM, and MIRLAB. He received a Ph.D. in computer science and informatics from the College of Engineering, Mathematical and Physical Sciences, University College Dublin (UCD), in 2006. He was a Postdoctoral Fellow of the Computer Science and Informatics School, University College Dublin (UCD), from 2006 to 2007. He joined the University of Kurdistan Hewler, in 2017. His research interests include three fields. The first field is the expansion of machine learning and data mining to deal with time series applications. The second field is the development of DNA computing, optimization, swarm intelligence, and nature inspired algorithms and their applications. The third field is networking, telecommunication, and telemedicine applications. He has authored and edited 128 webs of Science and Scopus publication documents overall, including books and book chapters in CRC, Springer, Elsevier, and IET).

It is noteworthy that Professor Tarik Ahmed Rashid is on the prestigious Stanford University list of the World's Top 2% of Scientists for the year 2022. The ranking has been performed with the condition of 44 criteria.

Tarik is also on the list of top 10 researchers in the Al-Ayen Iraqi Researchers Ranking (2022). AIR-Ranking 2022 is a national ranking organized by Al-Ayen University. The ranking has been performed with the condition of 24 criteria.



Dr. Debmalaya Biswas

Director- Data Analytics & AI
 Wipro
 Geneva,
 Switzerland

Debmalaya Biswas has over 20 years of experience working on AI/ML, Big Data Analytics, Privacy & Security related topics; most recently as Director, Data Analytics & AI at Wipro, Switzerland. He has previously worked for leading technology companies, e.g., Nokia Research, SAP Research, Oracle, Swisscom, and Swiss startups Iprova and Darwin Digital. He has authored 50+ patents, 30+ scientific articles, is a regular speaker at leading AI/ML conferences and is a member of the AI4EU Evaluation Committee. He holds a PhD in Computer Science from INRIA, France.



Dr. Pankaj Gupta

Founder, CTO and Chief Scientist
 DRIMCO GmbH Germany
 Principal Investigator
 (Research & Innovation Project by Federal
 Ministry Germany)

Dr. Pankaj Gupta is the Founder, CTO and Chief Scientist of the AI start-up DRIMCO GmbH Munich. Dr. Gupta is a renowned expert in Natural Language Processing and Machine Learning with over a decade of scientific and practical experience. With his extensive knowledge and experience, he develops innovative enterprise products to digitise industrial requirements and optimise business processes based on cutting-edge AI research. Pankaj also leads the innovation project OpenFLaaS (Open Federated Learning as a Service) funded by the German Federal Ministry.

Dr. Pankaj Gupta holds a PhD in Computer Science from University of Munich (LMU) Germany, and has pursued his passion for research, innovation and products throughout his career. He has a strong academic background and completed his Master's degree at the Technical University of Munich. He has conducted research in Text Understanding, Topic Modelling, Natural Language Processing, Deep Learning, Continual and Federated Learning techniques. At the University of Munich (LMU), he lectures on Deep Learning and Artificial Intelligence and supervises PhD and Master students. Dr. Gupta actively publishes his research results at major AI conferences such as ICLR, ICML, AAAI, NAACL, EMNLP, COLING, etc. and holds 15 patents.

Previously, Dr. Gupta worked as a Senior Research Scientist for Deep Learning and Natural Language Processing at Siemens AG Munich and had completed an internship at the IBM research lab in Zurich. He also advises AI start-ups on product-led growth and innovation. He has been a featured speaker at numerous prestigious events around the world



Prof. Dr. Khalid Hussain

School of Computing and Informatics
 Albukhary International University
 Malaysia

Professor Dr. Khalid Hussain is working as a Professor in the School of Computing and Informatics at Albukhary International University Alor Setar Kedah Malaysia. Before this he was working as a Professor of Cyber Security at Superior University Lahore and Campus Director at National Superior Institute of Science and Technology (NSIST) Islamabad, previously he had served as Dean of the Faculty of Computer Science and Campus

Director in Barani Institute of Sciences ARID Agriculture University, for the last one and half years. He also served at The University of Lahore as Dean Faculty of Computer Science and

Information Technology for three years. Dr. Khalid has vast university/industry experience. During his tenure in the industry, he served in defense-related projects, and in recognition of his services, he has been awarded commendation certificates by multiple government agencies. He joined academia in 2008 as a full-time faculty member. In addition to his teaching role, he has been involved in numerous research projects, ICT pieces of training, seminars, and workshops especially in the domain of Cyber Security. He helps set up a pioneer setup for information/ network security certification in Pakistan. He also introduced EC Council certification under the first academia-industry partnership. That project started from a one-room office and has grown into a fully functional campus of RIPHAH University.

He did his Ph.D. from Malaysia, under a fully funded UTM / HEC scholarship. Up till now, he published 64 papers. Of which 28 are ISI Indexed Impact Factor, 13 are in HEC-approved journals and 23 are in IEEE and ACM conferences.

Except for this, he also has seven book chapters and three books for his credit. His Cumulative Impact Factor is 83.032. He has completed six applied research projects in the domain of Information Security funded by NESCOM and other funding agencies. Up till now 21 MS and 03 Ph.D. students completed their research thesis under his supervision. Currently, he is supervising 13 MS and five Ph.D. students.



Prof. Dr. Jairo Gutierrez

Professor, Engineering, Computer and Mathematical Sciences
Department of Computer Science and Software Engineering,
Auckland University of Technology,
New Zealand

He arrived in Auckland in 1992, worked as Information Systems Manager for three years and joined academia as a Lecturer in 1995 in the then Management Science and Information Systems (MSIS) Department at the University of Auckland. He completed his PhD in 1997 (third granted by MSIS and first in Information Systems) and was promoted to Senior Lecturer in 2000. His last service position at Auckland was as Deputy Head of Department (Research). He left what had become the Information Systems and Operations Management (ISOM) department in 2009 and moved to Colombia to serve as Professor in the Faculty of Engineering and Director of Research and Innovation at Universidad Tecnológica de Bolívar (UTB) in 2010-2011. He joined AUT in February 2012 and became Head of Computer Sciences from Nov. 2013 to Oct. 2015.

While at Auckland he was a Visiting Researcher at Kent Ridge Digital Labs (National University of Singapore, July – Dec. 1998) and a Visiting Professor, School of Telecommunications Engineering of Barcelona (ETSETB), Technical University of Catalonia (UPC, Sept. 2005-March 2006).

Session Speakers



Assoc. Prof. Dr. Marina Yusoff

Deputy Director
Institute for Big Data Analytics and Artificial Intelligence (IBDAAI)
Universiti Teknologi MARA (UiTM)
Malaysia

Marina Yusoff is currently a deputy director and senior fellow researcher at the Institute for Big Data Analytics and Artificial Intelligence (IBDAAI) and Associate Professor of Computer and Mathematical Sciences, Universiti Teknologi MARA Shah Alam, Malaysia. She has a Ph.D. in Information Technology and Quantitative Sciences (Intelligent Systems). She previously worked as a Senior Executive of Information Technology in SIRIM Berhad, Malaysia. She is most interested in multidisciplinary research, artificial intelligence, nature-inspired computing optimization, and data analytics. She applied and modified AI methods in many research and projects, including recent hybrid deep learning, particle swarm optimization, genetic algorithm, ant colony, and cuckoo search for many real-world problems, medical and industrial projects. Her recent projects are data analytic optimizer, audio, and image pattern recognition. She has many impact journal publications and contributes as an examiner and reviewer to many conferences, journals, and universities' academic activities.

**Mr. Mike Ó 'Conroy**

Director & Co-Founder
Talk Bpo (Ireland) Ltd
Taguig, National Capital Region
Philippines

Mr Michael Conroy MBA, (DrIT) received his undergraduate studies in Business Management at Thames Valley University London, United Kingdom, his Law Enforcement professional studies as a New South Wales Police Officer from New South Wales Police Academy Goulburn NSW Australia and his MBA with (Hons), in IT-BPO Strategic Management from, Ateneo De Manila & Regis University Co USA. Mr Conroy is now pursuing his 4th year part time research for his Doctorate Degree in IT&T from Charles Sturt University, NSW Australia in Robotic Process Automation and Artificial Intelligence within the IT-BPO Shared Service Industry

Mr Conroy is an Australian & Irish Citizen, now residing & fifo between the Philippines, EU & Australia for the past 16 years. He is also a former resident of USA, Singapore, Saudi Arabia and India. Prior to Mikes contracted appointment at Kryon - Nintex RPA Systems (Singapore) Ltd, in Digital Management for APAC, Mike was Country Manager at Atos IT Shared Services The Philippines. Michael was also a visiting professor at King Saud University Riyadh on behalf of Kent State University, USA in Saudi Arabia in Entrepreneurship, Adjunct Professor at AIM Philippines in Strategic Mgt for MBA's and Adjunct Faculty at Enderun College Manila the Philippines, in Undergraduate Strategic Mgt within IT-BPO Shared Service Studies.

Mike is also Co-Founder and current Director of Talk Bpo (Ireland) Ltd. In his career to date, he is supported by his wife, Crissy and two young daughters Orlagh and Ryanne

**Dr. Tengku Intan Suzila Tengku Sharif**

Senior lecturer/ International Liaison Officer
Universiti Teknologi MARA
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Debmalya Biswas has over 20 years of experience working on AI/ML, Big Data Analytics, Privacy & Security related topics; most recently as Director, Data Analytics & AI at Wipro, Switzerland. He has previously worked for leading technology companies, e.g., Nokia Research, SAP Research, Oracle, Swisscom, and Swiss startups Iprova and Darwin Digital. He has authored 50+ patents, 30+ scientific articles, is a regular speaker at leading AI/ML conferences and is a member of the AI4EU Evaluation Committee. He holds a PhD in Computer Science from INRIA, France.

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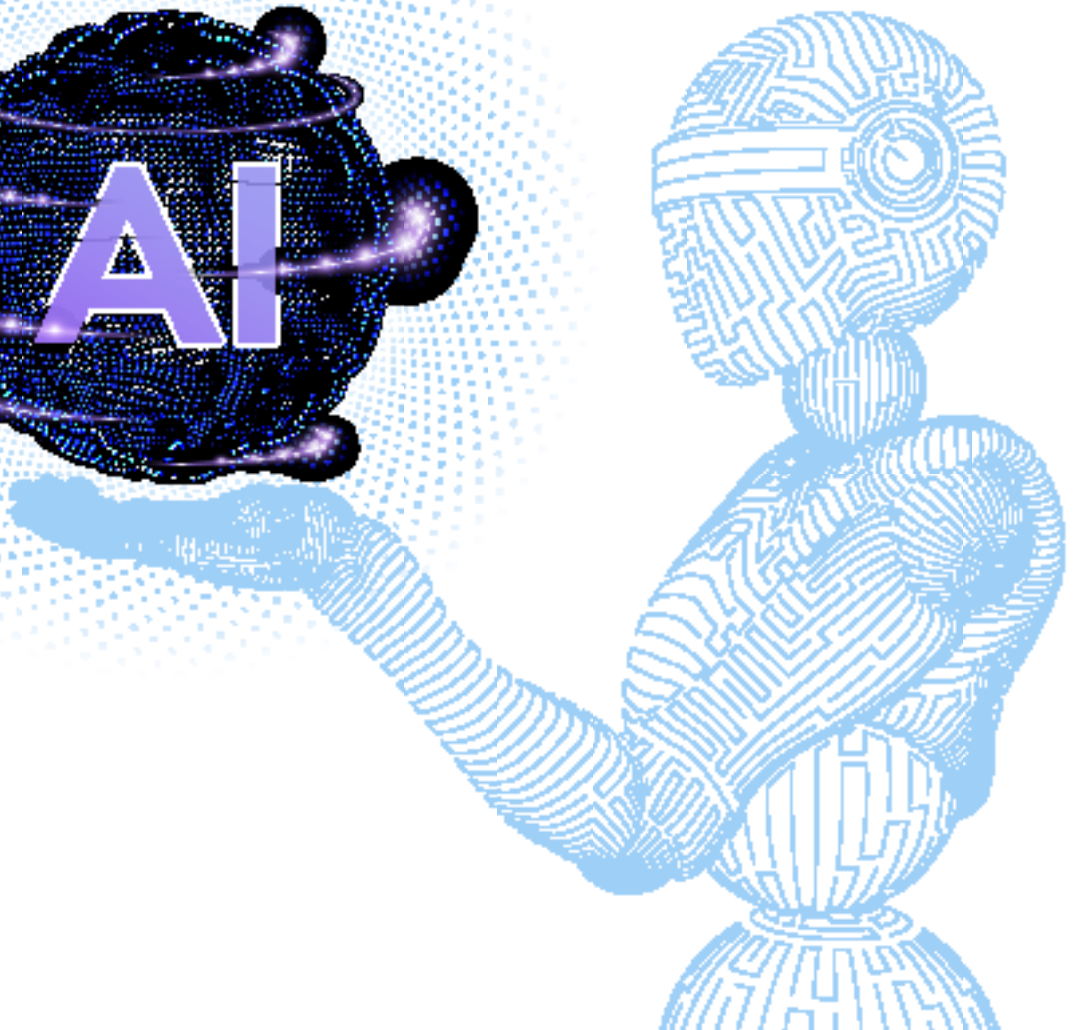
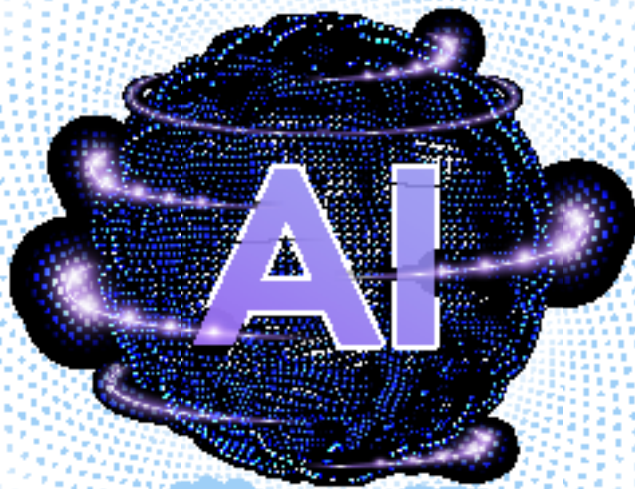
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ABSTRACTS



The effects of online peeragogy on university students' critical thinking

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Abstract

The globalization of the economy, the blending of various cultures, changes in the social environment, and the requirement for democratic progress as mankind enters the digital age have enhanced the importance of critical thinking and made it an important educational goal. Chinese higher education also need to create a model of training that goes beyond basic knowledge and develops critical thinking in order to produce high-level talent capable of participating in international affairs and national strategies. Thus this study design the research answering the three questions: first, what is the university fresh students current critical thinking ability? Second, can online peeraogy promote students' critical thinking ability? Third, what factors in online peeragogy influence students' learning ? The study finds efficient online peeragogy activities need focus on the following three aspects to execute: technology, teaching, and learners' aspect. What's more, the key feature for linking the above three aspects is communication: between students, between students and teachers, between students and materials, between students and online apps.

Index Terms

online peeragogy, critical thinking, university students, impact factors

Post Occupancy Evaluation of the Urban Public Space through social media: a case study of Bryant Park, NY

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Abstract

In modern cities, urban public spaces such as parks, gardens, plazas and streets play a big role for people's social activities, physical activities, mental health, and overall well-being. However, the traditional post occupancy evaluation (POE) process for public spaces like large urban parks is extremely difficult especially long-term user experiences through observations, surveys and interviews. On the other hand, social media have emerged as a major media outlet recording millions of user experiences to the public which provide opportunities to inform how a public space is used and perceived by users. Using Bryant Park as an example, this study presents a new analytical framework POSE (post occupancy social media evaluation) to support long-term POE studies for large public spaces. Methods such as data automation, descriptive statistics and social network analysis were used. We demonstrated how our approach can identify and quantify meaningful park activities, scenes, and sentiments as well as their relationships. The results in this study are sensible and echo with previous literature regarding social lives of public spaces. Future researchers and practitioners could refer to this case study to support POE studies of large public spaces (e. g. Bryant Park).

DESCRIPTIVE ANALYSIS OF COVID-19 PANDEMIC IN INDIA BY USING POWER BI

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Abstract

India, on 27th January 2020, reported its first positive case of the novel coronavirus (nCoV) from Kerala with a student, who was studying in Wuhan University and had travelled to India, testing positive for the virus. The world is under pressure from the novel COVID-19 pandemic. India is the most populous country in the world and predicted to be affected significantly over a longer time period. The COVID-19 pandemic in India is a part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Power BI is an online service that enables searching data, transforming it, visualizing it in very less time, and sharing the developed reports and dashboards. Power BI is having a free option that has adequate features and functionality. Power BI plays an important role, since Power BI is an extremely powerful tool for analyses large data sets. Power BI is a cloud-based analysis service that provides rapid insight and is used to extract and visualize data. Power BI brings together data from multiple sources to give you a comprehensive view of your organization information assets. In this paper We analyzed Covid -19 Data for Descriptive analyses by importing Data from Excel or CSV file. after Importing we perform Data wrangling on Data by Power Query Editor. We used Python Data Manipulation library to find Correlation between Data. at the end of our Research work we designed Report and Dashboard to analyze the Data set of COVID-19 In India. That As of 28 May 2023, according to Indian government figures, India has the second-highest number of confirmed cases in the world (after the United States of America) with 44,987,339 reported cases of COVID-19 infection and the third-highest number of COVID-19 deaths (after the United States and Brazil) at 531,843 deaths. In October 2021, the World Health Organization estimated 4.7 million excess deaths, both directly and indirectly related to COVID-19 to have taken place in India.

Keywords

Visualization, Data Analytics; COVID-19; Power BI; Dashboards; Visual Analytics, Report.

Human-machine Translation Model Based on Artificial Intelligence Translation

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Abstract

The development of artificial intelligence (AI), cloud computing, Big data, and other technologies have promoted the rapid evolution of the data center industry in the intelligent direction. As a new human-computer interaction mode, human-computer translation is essential in information transmission. However, many translation systems have certain defects, such as high error rates and low accuracy rates, and cannot meet personalized needs. This article, taking AI translation as the research object, analyzed attention mechanisms and other related technical methods, summarized and explored the limitations of traditional translation methods, and constructed a human-machine translation model based on AI translation, which had a clearer understanding of the differences in translation quality between different methods. It provides a reference for improving translation models and exploring the application of AI translation. The comprehensive automation and manual evaluation methods have proven that AI-based human-machine translation effectively improves issues such as insufficient matching between text expression and context, perfects the accuracy of intelligent recognition, and sets a subjective evaluation score of 1-10 for users, with a score of 6 or above as qualified. The results showed that the language fluency score has increased from about 4.9667 for traditional Statistical Machine Translation (SMT) to about 6.6333 for AI-based human-computer translation. The AI-based human-computer translation model effectively improves the efficiency and accuracy of language input, enhances the correlation between intelligent recognition semantic features and text content, and promotes the development of AI recognition functions, thus better providing users with accurate, efficient, and high-quality services, and ultimately achieving automatic processing of natural language understanding and output.

Index Terms

Artificial Intelligence, Attention mechanism, Human-computer translation, Statistical Machine Translation

Economic and Environmental Impact Analysis of Green Building Materials in Facade Engineering

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Abstract

This study provides a holistic analysis of the economic and environmental impacts of green building materials, with a particular focus on facade engineering. Utilizing computer technology and project management methodologies, the research investigates a variety of sustainable materials used in facade construction, comparing their cost-effectiveness, energy efficiency, and environmental footprint. The findings contribute to a better understanding of the trade-offs and synergies between economic feasibility and environmental sustainability in green facade design. This research could aid decision-making in the construction industry, promoting a broader adoption of green building materials in facade engineering.

Keywords

Green Building Materials, Facade Engineering, Economic Impact, Environmental Impact, Sustainable Construction.

Optimize Searching Using Latent Dirichlet Allocation

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Abstract

This research focuses on topic modeling as a crucial method for exploring extensive document collections and uncovering latent topics within the data. Specifically, it highlights the Latent Dirichlet Allocation (LDA) algorithm from the perspective of natural language processing. The main objective is to gain an in-depth understanding of LDA algorithms and their implementation approaches. It covers dataset preparation, practical implementation of LDA, and exploring the potential benefits of integrating LDA into recommendation systems. A comprehensive analysis of LDA encompasses graphical representations, fundamental equations, optimization methodologies, and practical implementations, covering all procedural aspects. LDA analysis is performed on extracted verses from the King James version of the Bible as documents, revealing varying levels of topic associations across documents. Some documents show strong alignment with a single topic, while others have multiple topic assignments. The research findings reveal patterns and themes present in the data, providing valuable insights into the fundamental thematic composition of the analyzed documents. Additionally, the study contributes to existing knowledge by exploring the functionality, practical applications, and relevance of topic modeling and LDA in recommendation systems and natural language processing.

Index Terms

Bible verse, latent dirichlet allocation, recommendation system, topic modeling.

Classification of Russian Troll Tweets: Analyzing Political Motivation in Tweets from the Internet Research Agency using Machine Learning

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Abstract

This research investigates the impact of social media trolling on political events such as elections. The study utilizes the dataset of the Internet Research Agency, a Russian “troll factory” indicted by the US Justice Department in February 2018, to analyze tweets from 2012 to 2018, with the aim of creating a classification algorithm that will predict the political motivation of future tweets. The study involves running various classification algorithms, including Naive Bayes, K Nearest Neighbors, Random Forest, Histogram-based Gradient Boosting Classification Tree, and Light Gradient Boosting Machine. Data cleaning and categorization were done, assigning numeric values to each category. The resulting model scores and a breakdown of precision per category were analyzed. Word frequency analysis was also conducted to identify the most frequent words and understand the overall sentiment of the tweets and the topics targeted by the trolls. The research findings indicate that predicting the category of tweets is challenging, but the classification algorithms were able to do so with relatively good accuracy, especially for the NewsFeed and HashtagGamer categories. The study emphasizes the need for further research to improve accuracy of tweet classification algorithms and for social media platforms to continue their efforts to identify and remove troll accounts that aim to undermine political bias.

Keywords

troll farms, classification algorithms, tweets, social media, machine learning

Cost-Effective Multi-Factor Authentication Model for ATM Financial Fraud Prevention

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Abstract

In the present situation, Crime rates have experienced a substantial rise associated with Automatic Teller Machines (ATMs). Criminals have become more sophisticated and focused on targeting ATMs in recent years. The predominant authentication method used by most of the ATMs systems in India is a one factor authentication, which has made them vulnerable to incidents such as card swapping, shimming, card cloning, skimming, and shoulder surfing are among the methods employed in various attacks. These attacks exploit the minimal authentication measures employed by ATMs, raising serious concerns about their security. In response to this, banks have started adopting a dual-factor authentication system, particularly in India. Some banks have implemented the mechanism of generating a One Time Password (OTP) mechanism in conjunction using unique identification (UID) number for ATM transactions. However, this approach introduces a new concern as it relies on the cellular network for delivering OTPs. To address these issues, researchers have introduced a three-tier authentication mechanism. This paper aims to discuss the current issues related to ATM security and provide potential solutions by implementing alternative methods of authentication.

Keywords

Biometrics, security, shimming, PIN, trapping, ATM Security, Three-Tier Authentication System, Security Questions, Multifactor Authentication, Biometric Authentication, Fraud Prevention in ATMs, Identity Verification, PIN theft, Cash Trapping, Card Trapping, ATM Security Challenges.

Bridging Theory and Practice: The Ballot Education Project's Vision for Empowerment Through Data Science, AI, and Analytics

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Ballot Education project

Bright Botchway

Ballot Education project

Abstract:

The Ballot Education Project, a prominent non-governmental organization (NGO) in Ghana, is dedicated to fostering civic engagement, advancing ballot education, conducting research on rejected ballots, and raising awareness through campaigns. In today's rapidly evolving landscape where data science, artificial intelligence (AI), and analytics reshape social impact initiatives, our NGO leads the way in leveraging these technologies to bridge theory and practical empowerment.

This abstract encapsulates our commitment to harnessing data-driven insights for meaningful change in Ghana's electoral processes. Through innovative approaches, our NGO translates theoretical knowledge into actionable strategies, empowering citizens, informing decision-makers, and strengthening democracy.

As we embark on this data-driven journey, our Director of Communication will soon present critical data and insights supporting our vision. Together, we showcase the transformative potential of data science, AI, and analytics in enhancing civic education, voter awareness, and electoral integrity.

Stay tuned for an insightful presentation highlighting our work in Ghana's democracy, illustrating how our NGO turns theory into practice through data power.

Decision Support System for the Sangguniang Kabataan of La Trinidad Using Sentiment Analysis and Descriptive Analytics

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Abstract:

Public opinion and similar data are generally used in governance to inform policymakers about public preferences. With social media as a powerful platform for citizens to express their opinions, sentiment analysis can be a tool to measure public opinion on public services so the government can reset its priorities or programs. This paper explores the use of sentiment analysis and descriptive analytics with the development of a decision support system for the Sangguniang Kabataan of La Trinidad. A model based on Naïve Bayes algorithm was used to determine whether comments on the organization's Facebook Page posts were positive, negative, or neutral. Descriptive analytics was used in a developed system to present the insights obtained from the results of the sentiment analysis. The usability of the developed system was measured using the Post-Study System Usability Questionnaire. Developmental and descriptive types of research were employed in the study. Results revealed that the developed machine learning model used for sentiment analysis was accurate in its classification of comments and that the developed decision support system was usable in terms of system usefulness, information quality, and interface quality. Overall, this study was able to successfully achieve its general objective which is to develop a decision support system for the Sangguniang Kabataan of La Trinidad.

Multivariate analysis and Machine Learning: Mortality Predictions In COVID-19 Patients From Comorbidity, Demographic and Laboratory Findings

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Abstract:

COVID-19 Patients were constantly at a risk of death. It has been demonstrated that the utilization of machine learning (ML) algorithms could be a possible strategy for prediction mortality. This study aimed to analysis six Machine Learning (ML) algorithms in an multivariate analysis to identify key clinical, demographic and laboratory finding to predict mortality in COVID-19 pandemic. This retrospective study consisted of persons-under-investigation for COVID-19. Dataset taken from data science community (kaggle.com), predictive models of mortality were constructed and compared using six supervised machine learning algorithms: KNN, naivebayes, SVM, decision tree, random forest and logistics regression using 10-fold cross-validation and multivariate analysis. The performance of algorithms was assessed using precision, recall, F-measure accuracy and area under the receiver operating characteristic curve (ROC). The Waikato Environment for Knowledge Analysis (WEKA) version 3.8.6 for analysis. Multivariate analysis using Logistic regression were used to predict mortality. A total of 4711 patients were included in the analysis. The top 4 mortality predictors were Mean Artery Pressure (MAP) ($p < 0.001$; OR 17.071(12.233–23.820), stroke ($p < 0.001$; OR 3.499(1.883–6.503), Age ($p < 0.001$; OR 3.23(2.716–3.830), IL6 ($p < 0.001$; OR 2.03(1.512–2.725). Random Forest was the best ML algorithms predicted mortality with 0.953 ROC. This study identifies important independent clinical variables that predict COVID-19 infection-related mortality. The prediction method is helpful, easily improved, and easily retrained with new data. This method can be applied right away and may help front-line doctors make clinical decisions in situations where there are limited resources and time.

Index Terms

sars cov-2 mortality, data mining research, machine learning algorithm, prediction models, big data study

Exploring the Role of Machine Learning in Forecasting Student Performance in Education: An In-depth Review of Literature

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Abstract

Background: The existing literature on the role of machine learning in forecasting student performance in education lacks comprehensive data quality, equitable and interpretable models, consideration of contextual and causal factors, and the integration of human expertise. This review will explore machine learning types, algorithms, predictive performance, and impact on student performance in education. A systematic literature review based on articles published in the past 2019–2023 period. **Methods:** The IEEE Xplore database was searched by using keywords such as “Educational Data Mining,” “Student Performance Prediction,” “Evaluations of Students,” “Performance Analysis of Students,” and “Learning Curve Prediction.” were employed and 50 papers were selected. **Results:** The analysis of the results highlighted prominent patterns. Half of the studies favored supervised learning methods, with decision trees leading (19 instances), followed by Long Short-Term Memory and Random Forest (16 each), and K-Nearest Neighbor and Naive Bayes (12 and 11 times). Support Vector Machine and Logistic Regression were noted 10 and 9 times, respectively. Noteworthy were ANN, CNN, and Xgboost. Positive impacts were evident in 36 cases; only one showed negative effects, while 13 indicated intricate relationships. This study helped in understanding the prevalent machine learning methods used for predicting student performance and provides a benchmark for assessing the effectiveness of new or alternative techniques. **Conclusion:** This review highlights the varied machine learning uses in predicting student performance in education, emphasising supervised methods, diverse algorithms, and complex intervention impacts.

Keywords

EduData Mining, Predictive Analytics, Student Performance, ML in Education, Learning Analytics, Academic Forecasting

Stress and Emotion Detection System Utilizing IoT and Machine Learning with a Fuzzy Inference-Based Mental Health Risk Assessment Module

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Abstract

This research paper describes the conceptualization, deployment, and application of a stress and emotion detection system (SEDS) that utilized emerging technologies including machine learning, the Internet of Medical Things (IoMT), and fuzzy logic. Particle Photon microcontrollers were used to collect and analyze data from non-invasive biosensing devices, input switches as behavioral stress indicators, and input signals generated by the machine learning-based facial identification sub-module, which detects an individual's emotional states (happy, sad/upset, angry/irritable, or nervous/afraid). The acquired parameters were stored and made readily accessible using IoT cloud services and dedicated mobile phone applications. The emotional condition of an individual was assessed by the utilization of the Personal Image Classifier tool within the MIT App Inventor, which involved the analysis of facial expressions. Furthermore, the SEDS was integrated with a module for mental health risk assessment that uses fuzzy logic to categorize the user's mental health risk level associated with stress as normal, low, moderate, high, or extremely high based on the data acquired. The customized smartphone application provided users specific recommendations for effectively managing their mental health, based on stress level assessments. When the SEDS determined that the level of mental health risk posed by stress was high, it automatically generated a referral notification and transmitted it via text message to the mental health care professional, facilitating the provision of appropriate psychological counseling. Based on the collected data, the stress and emotion detection system produced results that were comparable to those from the DASS21 stress scale. The system demonstrated an improved accuracy of 90% in a test involving thirty individuals who volunteered to participate. The machine learning-based emotion detection system achieved a classification accuracy of 86.67% in correctly detecting happy, sad, angry, or frightened feelings through the analysis of facial expressions. This research is designed to provide mental health care professionals such as guidance counselors, psychologists, and psychiatrists with the resources essential to facilitate the evaluation and treatment of mental health issues. It also aims to raise people's understanding and detection of psychological conditions through enhanced awareness initiatives.

Keywords

machine learning; internet of medical things; fuzzy logic; mental health risk; stress; emotion detection

Recent Progress of Recommendation of Cultural Heritage Resources

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Abstract

Cultural Heritage (CH) resources refer to all objects, places and information resources with historical, artistic, scientific and other cultural preservation values in various forms. With the development of the Internet, technology, and means of communication, the production of CH digital data and resources has multiplied at all levels, the application of recommender systems in the CH domain has appeared in recent years and began to play a key role in the domain. The widespread applications of recommender systems in CH domain are proposing places to visits, routes to CH sites, experiences or events, etc. To generate meaningful recommendations to relevant users what they prefer, researchers in the field have done plenty of research. Herein, we review important studies on recommendation of CH resources from Web of Science and Scopus database between 2018 and 2023, analyze their different strategies and key features, including recommendation approach, recommendation output, evaluation method to offer a good understanding of main features that distinguish existing recent approaches in the domain. At last, the primary challenges and future perspectives in this domain have also been highlighted. The finding of this study is that tourism or cultural visits related resources recommendation are the most studied object of research, evaluation methods for CH resource recommendations are more diverse than those of traditional recommendation systems and, apart from dealing with common problems of recommender systems, the most addressed problems is improving user experience.

Index Terms

cultural heritage resources, recommendation, progress

Optimizing Sentiment Analysis of Social Media Data: Investigating Public Perception of Environmental Challenges in Malaysia

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Abstract

The present study proposes a novel method for sentiment analysis on social media data, specifically Twitter data, and demonstrates its efficacy for predicting sentiments related to environmental issues. The proposed method employed state-of-the-art algorithms and machine learning approaches to perform the sentiment analysis of tweets pertaining to environmental challenges in Malaysia, a country with significant social media usage in the Asia-Pacific region. The results showed that most of the tweets analyzed were neutral in sentiment, suggesting a less polarized discourse on environmental challenges in Malaysia. The findings highlight the need for policy changes and environmental education to promote concern for environmental challenges and pro-environmental behavior among Malaysian residents. The proposed method is simple to use and accurately predicted sentiment from the Twitter data. In addition to providing a valuable tool for researchers, the method has the potential to advance the field of sentiment analysis on social media and be replicated in future research and practice.

Keywords

Big data analytics; environmental challenges; social media; sentiment analysis; text mining

Smart Framework for Scanless Checkout: Deep Vision-Based Automated Grocery Shopping System

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Abstract

Supermarkets and hypermarkets play a vital role in the retail marketplace, offering a wide range of products to customers. However, the traditional manual product scanning and billing processes in these establishments often lead to inefficiencies and time consumption, particularly during rush hours. To address these challenges and enhance the overall shopping experience, this research proposal presents the SwiftPay Trolley, a framework designed to automate product scanning, real-time billing, and seamless integration with cashier terminals. The SwiftPay Trolley leverages the power of deep learning and vision-based systems, incorporating advanced technologies such as IoT IP cameras and motion sensors. By automatically detecting and identifying items placed in or removed from the trolley, the system eliminates the need for manual scanning by cashiers. Real-time updates of the trolley's contents are seamlessly transmitted to the cashier's terminal, ensuring accurate and efficient billing. Through the SwiftPay Trolley App, users have the convenience of managing their expenses, tracking their total expenditure, and making informed decisions within their budgetary constraints. This not only enhances customer satisfaction but also streamlines the shopping process by significantly reducing wait times, especially during peak hours at supermarkets and hypermarkets.

Keywords

YOLOv5 · IoT · Smart Trolley · Smart Billing · Object Detection · Object Tracking · MOSSE

CrimeScene2Graph: Generating Scene Graphs from Crime Scene Descriptions using BERT-NER

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Abstract

Unstructured text plays a crucial role in crime scene investigation, as it contains vital information about events, suspects, witnesses, and other relevant details. However, extracting meaningful information from unstructured police reports remains a challenging task. Despite the significance of extracting information from crime scene text, this area has received limited research attention. Few studies have adequately addressed the challenges specific to crime scene reports, resulting in a lack of comprehensive solutions. This research focuses on the importance of addressing this challenge by utilizing advanced deep learning techniques to generate scene graphs, enabling a structured representation of crime scene information. We propose a BERT-based NER applied on a custom dataset tailored to crime scene-related entities and relationships, facilitating more accurate and contextually informed information extraction. The generated scene graphs serve as powerful tools for crime scene investigation, enabling investigators to visualize complex relationships, uncover hidden connections, and gain a comprehensive understanding of the crime scene dynamics.

Keywords

BERT · NER · Crime Scene Investigation · Scene Graph Unstructured Police reports · Named Entity Recognition · Deep Learning

Privacy-Aware and Ethical Framework for Vision-Based UAV and UGV Cameras: A Proposed Approach

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Abstract

In all the eras we have lived, whether in the present or in earlier times, privacy and ethical issues have been significant societal concerns for the entire community. While numerous emerging technologies, such as unmanned aerial vehicles (UAVs), unmanned ground vehicles (UGVs), and high-resolution cameras, have the potential to make daily existence more convenient for individuals; they also constitute an undeniable threat to individual privacy. Whereas a great deal of research has already been done in this domain, its limits and scope only take into contemplation internal privacy concerns, whereas these issues should be addressed in all contexts. This research is focused extensively on proposing the framework that enables the most suitable approaches for privacy-aware and ethical considerations to demonstrate how vision-based surveillance systems with high-definition cameras will not be able to disrupt communal ethics and deteriorate privacy. It emphasizes the persisting discourse on the responsible incorporation of vision-based cameras in surveillance systems, enabling stakeholders to make informed decisions and establish a balance between safety, privacy, and ethical issues. We culminate by proposing a framework along with recommending ethical standards and legislative recommendations to mitigate possible hazards and assure the accountable deployment of these emerging technologies.

Keywords

Vision-based cameras, UAV, UGV, Ethical practices, Privacy concerns

Explainable Machine learning based model for Heart Disease prediction

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Abstract

Machine learning (ML) techniques have been utilized for making heart disease predictions as it holds immense clinical value. Many countries lack cardiovascular expertise and struggle with misdiagnosed cases. Furthermore utilizing ML for this task presents its own challenges. To address these issues, an effective prediction of heart disease using explainable decision-making supported by patient records is crucial. Explainable machine learning is now generating a lot of attention across a variety of areas because of its promise for interpretability. Machine learning algorithms have the potential to forecast heart disease and help in early detection. This paper presents an explainable AI-based machine learning model to predict the risk of heart disease. The relevance of each feature in the prediction is calculated and visualized using the Shapley Additive exPlanations (SHAP) framework to make the model's outputs clearly explainable. Furthermore, we utilize multiple supervised ML classifiers and compared their performance to provide an effective model. Our experimentation concludes that the Gradient Boost algorithm achieved the best results with a test accuracy of 87.9% and an ROC value of 0.931. These findings demonstrate that ML classifiers combined with explainable AI techniques can yield impressive results for detecting heart disease, offering promising clinical utility.

Keywords

Explainable AI, Shapley Additive Explanations (SHAP), Machine Learning (ML), Feature Selection, Heart Disease Prediction

DDoS Attack Mitigation Techniques in SDN Planes

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Abstract

The concerns about network security are growing as internet technologies progress quickly. Numerous techniques have been put out in the interest of secure network architecture, and SDN is one of the best options for dealing with network expansion-related problems. Software-defined networks (SDN) have proven to be progressive in satisfying the requirements of modern networks due to their inherent characteristics such as global view, programmability, agility, and centralized and dynamic network control. However, distributed denial-of-service (DDoS) assaults might jeopardize the flexibility and availability of resources in a network. This research discusses DDoS mitigation solutions for three layers of SDN separately: the application plane, the control plane, and the data plane.

Keywords

Distributed Denial of service (DDoS) attacks, Software Defined Networks (SDN), Network Security

Research on Crowdsourced Dataset Labeling System Based on Blockchain Technology Applied to ChatGPT

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Abstract

ChatGPT, an Artificial Intelligence Generated Content (AIGC) model developed by OpenAI, is attracting worldwide attention for its ability to handle challenging language comprehension and generation tasks in the form of conversations. ChatGPT, as an intelligent conversational model based on deep learning techniques, is used in the preparatory phase of model training, where the preparation of the training dataset involves manually labeling the information on the text. Labeling. This preparation process often takes a lot of labor and time. In order to improve the efficiency of the data preparation phase and accelerate the generation and iteration of deep learning models, this paper proposes a crowdsourcing text dataset labeling system that combines blockchain technology with multi-people collaboration, which decomposes the heavy task of data labeling into small tasks, where the task publisher releases the dataset collection tasks, the workers receive the tasks and label the text, and the workers submit the results to the blockchain after labeling. After the labeling is completed, the workers will submit the results to the blockchain, and the task publisher will evaluate the labeling results received, and the evaluation will affect the token rewards received by the workers and the priority of the tasks to be obtained in the future, and by setting the token reward mechanism, it will attract more workers to participate in the labeling, and use the evaluation system to improve the accuracy of the data labeling and the motivation of the workers.

Proposing a Model to Predict Learning Effect in Metaverse Education Using Multimodal Learning Analytics

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Abstract

With the development of emerging technologies such as 5G, AR, and VR, Metaverse has attracted wide attention from online educational aspects. Compared to conventional learning that focuses on the observation and explanation of content, Metaverse provides learners with opportunities that change imagination into reality by means of diverse emerging technologies and allows learners to present in an interactive environment with immersive experience. However, from instructor's perspectives, such experience-based teaching and learning processes with high degree of freedom are hard to monitor and intervene, which is few research in consideration. Additionally, the reflection of simultaneous learners in Metaverse is complex, which needs proper approaches to investigate and measure the correlation between learning behaviors and learning performance to better understand students' learning status. In this sense, this study aims to propose a learning effect prediction model by using multimodal learning analytics to assist instructors in managing and improving the teaching and learning process in Metaverse education. The proposed model consists of two modules: multimodal data processing module and prediction module, in which Deep Neural Networks (DNNs) are utilized to extract features, reduce dimension, and construct the prediction model. In the future, the model will be trained by data and examined for its accuracy. Besides, the model can be applied further on various other aspects such as users' intention identification, students' engagement level evaluation, and course assessment while applying Metaverse into education.

Index Terms

Metaverse Education, Multimodal Learning Analytics, Learning Effect Prediction, Long Short-Term Memory (LSTM)

A Review of Cultural Heritage Resources Recommendation

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Abstract

Cultural Heritage (CH) resources refer to all objects, places and information resources with historical, artistic, scientific and other cultural preservation values in various forms. With the development of the Internet, technology, and means of communication, the production of CH digital data and resources has multiplied at all levels, the application of recommender systems in the CH domain has appeared in recent years and began to play a key role in the domain. The widespread applications of recommender systems in CH domain are proposing places to visits, routes to CH sites, experiences or events, etc. To generate meaningful recommendations to relevant users what they prefer, researchers in the field have done plenty of research. Herein, we review important studies on recommendation of CH resources from Web of Science and Scopus database between 2018 and 2023, analyze their different strategies and key features, including recommendation approach, recommendation output, evaluation method to offer a good understanding of main features that distinguish existing recent approaches in the domain. At the end of the paper, the primary challenges and future perspectives in this domain have also been highlighted. The finding of this study is that tourism or cultural visits related resources recommendation are the most studied object of research, evaluation methods for CH resource recommendations are more diverse than those of traditional recommendation systems and, apart from dealing with common problems of recommender systems, the most addressed problem is improving user experience.

Index Terms

cultural heritage resources, recommendation, research progress

Threats, Vulnerabilities, and Countermeasures in Cloud Computing

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Abstract

The way IT teams and enterprises manage their internal digital workloads and resources has undergone a transformation because of cloud computing. Security is one of the main drawbacks or restrictions of cloud computing, among others. Many risks and vulnerabilities exist in computers, and new ones are frequently discovered. Worldwide, reports of minor to major security incidents are made every year. To the best of my knowledge, the most current developments in cloud computing security are not covered in any recent research artifacts. This research analyzes the recent literature on cloud computing security to deal with this problem. Extending the threats proposed by Cloud Security provides a taxonomy linked to cloud computing risks and vulnerabilities dangers put forth by the Cloud Security Alliance, which can inform cloud users and assist cloud providers in strengthening or auditing their security procedures. Lastly, cutting-edge defenses and a classification of Furthermore, ways to defend the cloud from various threats are offered.

Keywords

Cloud computing security, cloud computing threats, cloud security countermeasures.

Efficient Disease prediction framework to suggest early treatment decisions in healthcare

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Abstract

This study proposes a novel framework for disease prediction intended to aid healthcare providers in making early treatment decisions. In order to efficiently identify early disease indicators and provide prompt suggestions for treatment interventions, the framework incorporates machine learning algorithms, clinical data analysis, and predictive modeling techniques (Smith, Johnson, & Davis, 2023). For the purpose of creating the framework, a comprehensive dataset made up of clinical records, demographic data, and test results from a large patient cohort was gathered. The dataset was analyzed using a variety of machine learning methods, and predictive models for various diseases were created. As evaluation criteria, accuracy, precision, recall, and F1-score were used to gauge how well these models performed. The experimental findings show that the suggested framework has a high degree of disease prediction accuracy. Additionally, by recommending early treatment selections. The approach offers the potential to improve patient outcomes and lower healthcare expenditures based on anticipated illness outcomes. The study benefits healthcare professionals, policymakers, and academics looking to use data-driven strategies for better disease management and patient care by providing an effective method for disease prediction and early treatment decisions.

Keywords

Disease prediction, Early treatment decisions, Healthcare, Machine learning, Healthcare outcomes

Password Security Best Practices

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Abstract

Password security is essential in today's digital environment for safeguarding private data and avoiding unauthorized access. Risks associated with using weak passwords include identity theft, data breaches, and financial loss. This research paper explores and presents best practices for password security, offering helpful advice for people, businesses, and developers to strengthen password security and reduce risks. The introduction of the paper provides a general review of the value of password security and the potential dangers of using weak passwords. A thorough analysis of the available research on password security identifies frequent weaknesses, assaults, and password cracking methods. The shortcomings of present password security procedures are highlighted, emphasizing the demand for better methods. The report then digs into recommendations for creating passwords, including rules for its length, difficulty, and originality. It is investigated how password generators and administrators can make it easier to create secure passwords. The paper also examines the advantages and disadvantages of various storage strategies, as well as secure password storage and encryption techniques including hashing, salting, and key stretching. In order to address the effects of password expiration, complexity requirements, and the avoidance of password reuse, the significance of password regulations, user education, and awareness campaigns is emphasized. Along with the various MFA techniques available, the advantages and difficulties of multi-factor authentication (MFA) systems are also discussed. Real-world case studies demonstrate situations where successful security measures have successfully prevented unauthorized access while illustrating the negative effects of password security breaches. Individuals can improve their lives by implementing the important conclusions and best practices presented in this study and organizations may strengthen their password security methods and defenses against assaults involving passwords.

Keywords

Password security, Best practices, Authentication, Cybersecurity

Investigating the Security Risks of Social Engineering Attacks and Prevention

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Abstract

This research paper explores the ongoing threat of social engineering attacks in cybersecurity. It emphasizes how these types of attacks take advantage of people's weaknesses to breach security systems. Social engineering attacks continue despite technological security measures because of human trust and behavior. The study explores attack techniques as well as effective defense measures. It also looks at countermeasures against phishing and deepfake attacks, with a focus on the use of forensic investigation and natural language processing tools. It is essential to use a multi-layered strategy that combines technological security measures, human awareness, and adaptation to stop social engineering attacks and protect confidential information. This article offers helpful guidance for preventing social engineering in the constantly changing cybersecurity environment of today.

Keywords

Social Engineering, Security Risks, Prevention Strategies

Physical Security to Cybersecurity (Challenges and Implications in the Modern Digital Landscape)

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Abstract

The transition from physical security to cybersecurity is a critical aspect of modern security management in the digital age. This research paper explores the challenges and implications of this transition, with a focus on the impact on digital assets and information, challenges for individuals, organizations, and governments, and best practices for mitigating cybersecurity risks. The literature review discusses the evolution of physical security and cybersecurity, key concepts and frameworks in cybersecurity, and best practices for managing cybersecurity risks. The research findings highlight the limitations of physical security in the digital landscape and emphasize the need for a proactive and comprehensive approach to cybersecurity. Contributions to the field of cybersecurity include insights into the evolving nature of cybersecurity threats, the importance of risk assessment and incident response planning, and the need for governance and risk management strategies. The limitations of the study are acknowledged, and recommendations for future research are provided. Overall, this research paper contributes to the field of cybersecurity by providing valuable insights and recommendations for enhancing cybersecurity measures in the modern digital landscape.

Keywords

Modern security management, Digital age, Transition, Physical security, Challenges

Research Issues and Challenges Countermeasures in Security Protocols

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Abstract

Cybersecurity is a critical concern in today's interconnected world, where the reliance on digital technologies is pervasive. This research aims to investigate various cybersecurity issues, including data breaches, network security, and cryptography, and explore ways to enhance security protocols. The evolving threat landscape in the cyber realm, coupled with regulatory requirements, poses challenges to individuals, businesses, and governments. Cyber-attacks, such as data breaches and ransomware attacks, can cause severe damages, and compliance regulations mandate organizations to implement robust cybersecurity measures. Cryptography plays a crucial role in securing communications and transactions using mathematical techniques. This research seeks to explore real-world examples of cybersecurity incidents, analyze causes and impacts, and propose potential ways to improve security protocols. By delving into key cybersecurity topics, this research aims to contribute to the understanding of cybersecurity challenges and opportunities for enhancing security practices in the digital landscape.

Keywords

Data breaches, Emerging technologies, Artificial intelligence, Blockchain, Security protocols.

Development of Social Media-based Suicidal Ideation Detection and Response System for Students using Natural Language Processing

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Abstract

Suicide has become a critical public health crisis with rates having increased approximately 36% between 2000–2021 (CDC). Suicide has been one of the leading causes of death in the world and amongst students especially at university level. The problem of suicide ideation has been prevalent for the longest time without any major response being used to tackle the problem. Every day students commit suicide and yet there have been no significant input from any giant organisation. There are various researches done on the natural language processing methods for detection of mental health and suicidal text. However, less than 10 works have been implemented when it comes to responding to this worldwide problem. The authors have very niche response systems and are not applicable to all social media platforms. Not only that, their privacy concerns make them less efficient as they cannot oversee all the content. In this study a machine learning model that is developed utilizing a Random Forest Classifier as it proved to be the best among all of them in predicting suicide ideation based on previous works, which is hundreds of research journals. This machine learning model will be integrated with the social media content that needs to be overseen for the students. And that will be done through the development of a Web application response system that will be inclusive of all the content related to flagged users at risk so that the optimal course of action can be taken to tackle the problem. The dashboard will be used by counselling services of all educational institutions so that they can take immediate action in preventing suicide amongst their students.

Index Terms

Suicidal Ideation, Social Media, Natural Language Processing, Machine Learning, Detection System

Study of Helmet Recognition for E-Bike Riders Based on Deep Learning

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Abstract

In recent years, the surge in e-bike ridership has raised significant concerns regarding road safety, particularly the usage of helmets. Road traffic accidents involving e-bikes can have severe consequences, making helmet use a critical factor in mitigating injuries and fatalities. To address this issue effectively, it is crucial to develop advanced helmet detection techniques that can assist in enforcing helmet regulations and enhancing the overall safety of e-bike riders. This paper delves into the pressing problem of helmet usage among e-bike riders involved in road traffic accidents, with a primary focus on the development and application of advanced algorithms for motorcycle helmet detection. In recent years, the field of target detection has witnessed significant progress, prompting a comprehensive exploration of lightweight single-stage helmet detection techniques rooted in deep learning methodologies for efficient and accurate target identification. The study begins by tracing the evolutionary trajectory of cyclist helmet detection algorithms, offering insights into the current state of research. It then meticulously examines the myriad challenges that persist within existing methods, particularly the scalability concerns arising from the inclusion of a substantial number of participants. Subsequently, the paper underscores the substantial advantages associated with single-stage target detection techniques, emphasizing the crucial elements of speed and precision. To address these issues, the study puts forth the YOLO (You Only Look Once) family of algorithms as the foundational framework for the development of efficient and lightweight helmet detection methodologies. Building upon the YOLO algorithm, the paper proposes the implementation of a real-time helmet identification system, poised to assist traffic authorities in the proficient management of road traffic while prioritizing the safety and well-being of cyclists. This research presents a significant step forward in enhancing road safety and accident prevention for e-bike riders, contributing valuable insights and practical solutions to a critical area of concern.

Index Terms

Helmet detection, E-bike safety, Target detection, Deep learning, Road traffic accidents

Real-Time Posture Correction for Safer and More Effective Exercise: A Computer Vision and Rule-Based Approach

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Abstract

With the increasing popularity of resistance training, the importance of proper exercise form, particularly in exercises like the squat, is crucial to avoid injuries and maximize fitness outcomes. However, access to affordable education or coaching for correct posture can be limited. This project aims to address this challenge by developing a low-cost system that utilizes computer vision technology to provide real-time feedback on squat exercise form. The project adopts a rule-based classification approach to analyse key body landmarks obtained through computer vision. By leveraging these landmarks, the system can detect and assess the alignment and positioning of body parts during the squat exercise. The system provides users with visual cues to guide them towards correct form, empowering them to exercise safely and effectively. The primary focus of this project is on rule-based classification, which relies on predefined rules and guidelines rather than complex machine learning models. This approach ensures that the system can provide accurate feedback on squat exercise form without the need for extensive data collection or training. To evaluate the effectiveness of the system, rigorous testing and refinement will be conducted to ensure its accuracy and reliability in real-world scenarios. The system's ability to accurately identify incorrect squat postures and provide relevant feedback will be assessed. By developing an affordable and accessible system for squat exercise form assessment, this project aims to enable individuals to exercise with confidence, reduce the risk of injuries, and improve overall fitness outcomes. The findings from this research contribute to the advancement of practical solutions for maintaining proper form during resistance training, providing a cost-effective alternative to traditional coaching methods.

Index Terms

resistance training, squat exercise, computer vision, real-time feedback, form assessment

Detecting and Filtering the Fake Reviews in Chinese E-commerce Sites by Using Artificial Intelligence

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Abstract

This study investigates the creation of sophisticated models to improve the detection of fraudulent evaluations in the Chinese e-commerce industry. The application of cutting-edge natural language processing techniques and intricate model structures could substantially enhance the precision of these detection models. In addition, ensemble learning and transfer learning techniques could improve model performance by combining the predictions of multiple models or by utilizing knowledge from related tasks. The research proposes a novel Deep Fusion model that integrates the predictive results of Random Forest and Bi-LSTM models. This approach demonstrated superior classification capabilities, with an accuracy of 88.00%, precision of 86.71%, recall of 98.04%, F1 score of 92.03%, and an AUC-ROC value of 80.94%. Collaboration with e-commerce platforms such as Taobao could provide a viable solution for data accessibility. A partnership of this nature would facilitate access to user review data while adhering to data protection regulations and allowing for improved generalization of models to new, unread reviews. In addition, a user-friendly interface and a feedback mechanism can contribute to an enhanced user experience. These enhancements can aid users in comprehending the system and gaining confidence in it while also facilitating their participation in identifying false reviews. The proposed feedback mechanism can simultaneously improve system performance and provide vital insights for model refinement. Therefore, this study offers a promising solution for preserving the integrity of the Chinese e-commerce site by presenting a comprehensive approach to detecting fraudulent reviews using advanced machine learning techniques, strategic collaborations, and user participation.

Index Terms

Fraudulent Review Detection, Natural Language Processing, Deep Fusion Model, E-commerce Integrity

A Machine Learning model for the Early Prediction of Stroke

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Abstract

Stroke is a leading cause of death and disability worldwide. Traditional methods of early stroke screening, which often rely on expensive and less accessible imaging tools such as MRI and CT scans, give rise to a pressing need for more affordable and accessible alternatives, including for those in developing countries. Currently, a multitude of machine learning predictive models exist as potential solutions for this need, offering a more affordable and widely accessible approach. However, a significant challenge lies in the selection of the most suitable machine learning algorithm from this wide range, given the uncertainty regarding the best performing model. To overcome these challenges we aim to identify the best performing algorithm from a wide array of machine learning models to predict the risk of stroke, which will then be used to build the model using the "Stroke Prediction Dataset" from Kaggle. We will also consider feature selection techniques to improve the performance of the stroke prediction system. Three machine learning classification algorithms (XGBoost, RandomForest and Logistic Regression) were used in this project. To optimize the models, Grid Search and cross-validation was applied. The performance of the model was evaluated based on the following metrics: Accuracy, Precision, Recall, F1-Score and AUC. The model with the best performance based on these metrics is the XGBoost model, showcasing superior performance with the highest accuracy score of 96.04%, precision score of 96.47%, recall score of 95.58%, F1 score of 96.02%, and AUC score of 96.04%. Given these results, the XGBoost model emerges as the most effective for the early prediction of stroke, outperforming both the Random Forest and Logistic Regression models and will be chosen to be deployed on the Streamlit web application. The expected outcome of this project is to identify individuals at higher risk of stroke, contributing to improved patient outcomes, and potentially serving as a screening tool for early intervention.

Index Terms

Stroke, Machine Learning, XGBoost, Early Prediction, Risk Assessment

Credit Loan Consultation and Risk Prediction System

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Abstract

Credit loan consultation and risk prediction system are presented which employs a fusion of Natural Language Processing (NLP) for question answering and machine learning (ML) models for risk assessment. The system is designed to enhance the precision and safety of loan processes while mitigating potential risks and safeguarding the interests of lenders. The system facilitates the creation and maintenance of a comprehensive question-and-answer database within the background management module. It supports essential functions such as addition, deletion, modification, and verification of entries. Furthermore, it interfaces with the bank's internal database, providing crucial data access for both the question-answering and risk prediction components. The credit loan consultation module leverages NLP-driven question answering. After evaluating four models (BERTQA, oBERTa-QA, XLNet-QA, and ELECTRA-QA), we select the BERT-QA model based on short text matching research. Experimental outcomes demonstrate the system's proficiency in accurately addressing user queries, thereby enhancing customer satisfaction and operational efficiency. In the risk prediction module, ML models are employed. This module predicts risk by amalgamating user-entered data with the user's financial history within the bank. Among five evaluated algorithms (decision tree, logistic regression, random forest, SVM, and neural network), a logistic regression model is adopted. Experimental results enhance the system's efficacy in precise risk assessment, leading to reduced loan risk and the protection of bank assets.

Index Terms

Credit loan consultation, Risk prediction, NLP question answering system, Machine learning predictive models, Logistic regression model

Enhancing Image Matching Performance with Deep Learning Neural Networks and Twin Network Architecture

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Abstract

Image matching is the process of determining or finding similarity and consistency between two or more images by specific algorithms. When the layout of an image scene changes significantly, such as changes in imaging conditions or environmental factors, the stability and resolvability of image features and the performance of image matching algorithms are affected. The traditional manual selection of image feature points for image matching is prone to large errors and has limitations. In this paper, a deep learning neural network model and a convolutional neural network-related algorithm are used to extract image features. In addition, this paper presents a detailed analysis of the difficulties that may be encountered during the training of the network model and provides corresponding solutions. Finally, this paper proposes a twin network architecture that uses a pre-trained model of convolutional neural network based on image classification to automatically extract feature information and content of images and calculate the similarity or matching degree between images using inter-coding distance. Experiments demonstrate that the algorithm can achieve good image matching results when a suitable training dataset is used.

Index Terms

Image Matching, Deep Learning, Convolutional Neural Network, Feature Extraction, Twin Network Architecture

Human Abnormal Behavior Detection Under Security Monitoring

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Abstract

In our fast changing society, safety issues have taken precedence, inspiring increased awareness in a variety of fields such as public safety, university security, community well-being, and the protection of elderly people living alone. While advances in intelligent security monitoring technology have increased, the necessity for effective security measures has not. Although the frequency of public situations such as violent altercations has decreased, such occurrences continue to occur, needing constant attention. Previous research efforts have deeply investigated these safety issues, laying the path for continued improvements and implementations. Currently, anomalous behavior detection relies mostly on well-established algorithms such as Fast RCNN, YOLO, and CNN, which are further improving the field's capabilities. Incidents such as falls among older people living alone and children's exposure to second-hand smoking are of particular concern.

Index Terms

Safety Concerns, Abnormal Behavior Detection, YOLO V5, Elderly Care, Indoor Security

Smoking Detection using Deep Learning Models

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Abstract

Smoking has been a major global health issue for decades, causing a range of smoking-related diseases. However, traditional methods are challenging due to accuracy and realtime detection limitations. Instead, deep learning methods can be an excellent solution. Four models are involved in model comparison: Faster RCNN, RetinaNet, YOLOv5, and YOLOv8. Following that, the best-performing one is chosen for further improvement. This project aims to improve the accuracy of the chosen deep learning model by applying the mosaic method and CBAM attention mechanism. At last, a web system with an improved model for smoking detection has been developed.

Index Terms

object detection; YOLOv8; mosaic method; CBAM; smoking detection

Enhancing Stock Price Prediction with Deep Learning Algorithms and Design Thinking

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Abstract

This research explores the feasibility of leveraging deep learning algorithms, coupled with a design thinking approach, to enhance stock price prediction. The stock market's dynamic and uncertain nature presents a significant challenge for investors and financial institutions. Factors such as financial news, market indicators, and psychological influences contribute to stock price fluctuations. Traditional linear regression models often struggle to capture the intricate dynamics of stock prices due to their nonlinearity and uncertainty. Consequently, sophisticated machine learning methods, including convolutional neural networks (CNN) and Long Short-Term Memory networks (LSTM), have gained prominence in the pursuit of accurate stock price predictions. The study also addresses technical challenges, such as integrating diverse data types (historical prices, market indicators, corporate financial data) and dealing with issues of data volume and quality. Deep learning models inherently require substantial data for training, and their efficacy hinges on data preprocessing, cleaning, and feature engineering.

Index Terms

Stock Price Prediction, Deep Learning, Design Thinking, Financial Markets, Data Science

Enhancing Internet Security: Accurate Prediction of Phishing Web Pages Using Hybrid Machine Learning Algorithms

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Abstract

This research paper proposes the utilization of machine learning algorithms to accurately predict phishing web pages, addressing the escalating threat they pose to internet security. The study encompasses an analysis of phishing page characteristics, the generation of datasets using synthetic data vault, data preprocessing employing various tools, and the evaluation of different algorithms, including logistic regression, support vector machine, random forests, and multi-layer perceptron. Performance assessment was conducted using metrics such as accuracy, precision, recall, and F1-score. The findings reveal that a hybrid machine learning algorithm combining logistic regression and random forests yielded the best results in predicting phishing web pages, exhibiting high accuracy, precision, recall, and F1-score. This research has significant potential to enhance internet security by offering a more efficient tool for detecting and preventing phishing attacks. In other words, this paper explores the application of machine learning techniques to accurately predict phishing web pages, presenting promising results that can contribute to improved internet security measures.

Index Terms

Internet Security, Phishing Detection, Machine Learning, Hybrid Algorithms, Web Page Prediction

The potential of Run-time Hardware Trojan Resilience in COTS Components using Side-Channel Monitoring of Software Signature

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Abstract

A commercial off-the-shelf (COTS) componentbased system design ecosystem enables fast development time and lower cost compared to custom solutions. However, integration of off-the-shelf hardware raises trustworthiness concerns due to the possibility of hidden malicious logic or hardware Trojans. Hence, integrating such components within a securitycritical system requires a “zero trust” approach where all the supply chain entities, including the design house and foundry, are considered untrusted [2]. Unfortunately, existing hardware Trojan countermeasures rely on one or more trusted supply chain entities and require golden chips and white-box accessibility to the design. Therefore, a novel approach to mitigate the threat of hardware Trojan attacks in off-the-shelf hardware is crucial for trusted field operation embedded systems made with COTS components throughout the product's lifetime. In this project, we aim to develop a runtime hardware Trojan resilience framework that leverages side-channel information of the untrusted components to identify functional anomalies caused by the activation of hardware Trojans and prevent the payload, e.g., functional failure.

Keywords

IC Security, Point of Interest, Trojan, Localization, electromagnetic side-channel, unsupervised

Enhancing License Plate OCR with PaddlePaddle: Framework and Implementation

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Abstract

Automatic license plate recognition is an essential technology for numerous applications, including traffic management, law enforcement, and parking access control. In recent years, significant advancements in Optical Character Recognition and deep learning have paved the way for improved ALPR systems. This research aims to develop a robust and accurate ALPR system based on Baidu's PaddlePaddle OCR (CRNN+CTCLOSS) and the CCPD dataset, a widely-used and comprehensive dataset for license plate recognition tasks. The proposed system intends to utilize the PaddlePaddle OCR framework, which incorporates Convolutional Recurrent Neural Networks (CRNN) and Connectionist Temporal Classification (CTC) loss, to efficiently recognize license plate characters. The project will involve training the model using the CCPD dataset, which contains various real-world scenarios, to ensure its effectiveness in diverse environments. Additionally, a user-friendly Graphical User Interface (GUI) will be designed to facilitate easy interaction with the software, making it accessible to a broad range of users. The successful completion of this research will contribute to the ongoing development of ALPR technology, particularly in leveraging deep learning techniques for improved accuracy and efficiency. The resulting software has the potential to benefit various industries and public services by streamlining operations and enhancing security measures.

Index Terms

Automatic License Plate Recognition, ALPR, Optical Character Recognition, OCR, Deep Learning, Convolutional Recurrent Neural Networks, CRNN, Connectionist Temporal Classification

Multi-feature Fusion Fatigue Detection Based on Deep Learning

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Abstract

In the recent era of population explosion and pursuit of a high quality of life, per capita car ownership is increasing year by year, resulting in a rapid increase in traffic accidents, and many families have paid a tragic price. According to a 2011 survey by the World Health Organization (WHO), 1.3 million people are killed in road traffic accidents every year, and China has the highest death toll in the world. About one in five deaths in all road traffic accidents is caused by driver fatigue. In the face of unforeseeable road traffic accidents, research on fatigue driving detection is very necessary. The design of a fatigue detection method to analyze the status of drivers in real-time and give reminders when fatigued driving occurs can effectively guarantee driving safety and reduce the occurrence of road traffic accidents.

Index Terms

Fatigue Driving Detection, Traffic Accidents, Driver fatigue, Real-time Analysis, Road safety

Detecting Early Heart Disease Using Machine Learning

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Abstract

Heart disease is the lead cause of death globally, early detection can prevent serious complications. The study aims to develop machine learning model to predict the risk of heart disease in individuals, identify the key risk factors associated with heart disease, and evaluate the performance of the model. The research questions focus on the effectiveness of machine learning techniques in predicting heart disease risk and the identification of key risk factors. The objectives include developing an accurate and interpretable model that can be used in clinical practice and comparing it with traditional risk assessment methods. The hypothesis is that machine learning models can accurately predict the risk of heart disease using patient data, and the selected demographic, clinical, and laboratory features are highly predictive of the risk of heart disease. This research aims to contribute to the early detection and prevention of heart disease by developing an efficient and effective tool for risk prediction.

Index Terms

Heart Disease Risk Prediction, Machine Learning, Key Factors, Early Detection, Clinical Assessment.

Fruit Type Recognition System Based on Convolutional Neural Network

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Abstract

This paper presents the development of a fruit type recognition system using convolutional neural network (CNN) in deep learning techniques. Fruit identification has been a hot research area due to its potential applications in agriculture and food industry. In this project, a neural network model was used to accurately identify edible fruit species. To train the model, a dataset of fruit images was collected from a wholesale agricultural product market and augmented with crawlers and live shots. The effectiveness of three different models, LeNet-5, VGG16 Net and MobileNet in fruit recognition is analyzed and compared. Selected models are then tested and the results analyzed to determine their validity. The results of this study are expected to help develop an effective and appropriate edible fruit classification recognition model, which can be used in various applications such as fruit classification in supermarkets and fruit terminal logistics sorting.

Index Terms

Fruit Recognition, Convolutional Neural Network, Deep Learning, Edible Fruit Classification, Agriculture

A Computational Implementation of Morphological Analysis and Generation of Verbs in Myanmar Language

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Abstract

The field of morphological analysis and generation focuses on the study of word production, the recognition of grammatical components within words, and the creation of words that adhere to morphotactic standards. According to various research reports, finite-state techniques are fast, effective, and efficient in interpreting human language morphologies into the computational system. FOMA: a more elaborate version of Xerox's finite state toolset can be used to implement the finite state morphology. Using FOMA toolset and other programming languages, we have already created the MM-Morph tool: a computational linguistic tool for morphological analyzer and generator for Myanmar nouns. In this paper, we describe the linguistic phenomena of the morphology of verbs and the techniques used in the system's development process to integrate it into the existing MM-Morph tool. MM-Morph has been developed as a part of the research "Morphological Analysis and Generation for Myanmar Language using Finite State Techniques." We share the experimental evaluations conducted to assess this system's performance. Evaluation results show that the MAG system of Myanmar verbs can identify more than (78%) of the verbs in the language.

Index Terms

Morphology, Natural Language Processing, FST, MM-Morph, FSA, Morphological analysis and generation (MAG), finite-state morphological analysis and generation (FSMAG), Computational linguistics tool, Indian Language, Myanmar Language, Xerox's xfst, FOMA

The Analysis of Crop Production Data for Predicting Future Trends of Highland Vegetables in Benguet

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Abstract

This study employs machine learning techniques to enhance agricultural prediction to secure future food supplies and support sustainable practices. It aims to forecast trends in highland vegetable crops in Benguet providing invaluable insights for enhancing yields and contributing to vital food security initiatives. Notably, the researchers concentrated on crop production data due to inconsistencies and incompleteness in historical datasets collated. Furthermore, it proposes a mobile platform for data collection from farmers, capturing their production and farming practices. This method intends to streamline the data collection process, enabling LGUs to effectively collate and utilize the information. The methodology employed a structured approach, encompassing data collection, preparation, analysis, modeling, and evaluation using Python programming and Power BI tools. In the analytical phase, a variety of machine learning models were explored, including Linear Regression, Lasso Regression, Ridge Regression, Decision Trees, SVM, and Random Forest. Model evaluation was based on the accuracy, MAE, MSE, and RMSE. The Random Forest model emerged as the most suitable choice, boasting the best metrics for production purposes with an accuracy of 98.94%. The outcomes of this study hold significant potential, not only in reshaping agricultural practices and decision-making but also in fostering sustainable approaches to highland vegetable cultivation.

Index Terms

Data Mining, Machine Learning, Predictive Analytics, Sustainable Agriculture

Sentiment Analysis of Filipinos about Online Classes in the Post-Pandemic Era Using Machine Learning and Code Switching

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Abstract

Understanding the issue faced during and after the pandemic is a concern of the educational system in the country, particularly the feelings of teachers and students regarding the matter. In this post-pandemic era of the years 2021-present, online learning continues to be a norm and its implementation still causes issues for some students and teachers alike. Student satisfaction and Instructor preparedness are both key factors to effective delivery of education through online learning. This study aimed to develop a model that analyzes the Filipino public sentiment on the implementation of online classes using Machine Learning. Result revealed that the Filipinos sentiment towards online classes are predominantly positive. The output of the study will be used for better and improved delivery of online classes in the Philippines in the post covid-19 pandemic era.

Keywords

Machine Learning, Naïve Bayes, Online Class, Sentiment Analysis

Analysing Implications of ESG Metrics for Sustainability & Efficiency in Indian Automotive Manufacturing using Disruptive Technologies

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Abstract

This paper conducts an extensive analysis of ESG metrics to evaluate the sustainability performance of car manufacturers. It thoroughly examines the ESG risks present in automotive production, specifically addressing environmental impact, social responsibility, and corporate governance. The report delves into various aspects, including carbon emissions, resource depletion, labor practices, human rights, product safety, supply chain management, board diversity, executive compensation, and regulatory compliance. These detailed discussions on ESG risks provide valuable insights for automakers, regulators, shareholders, and other stakeholders. Furthermore, the paper provides a comprehensive overview of the diverse applications of IoT in the automotive industry, emphasizing its significant benefits. It begins with a concise summary of IoT and its relevance to automobile manufacturing. The study explores various applications of AI, such as predictive maintenance, quality control, supply chain optimization, and robotics. It highlights how AI leverages real-time data from sensors and other sources to enable manufacturers to anticipate and prevent equipment breakdowns, optimize production timelines, and enhance product quality. Additionally, the research investigates the critical role of cybersecurity in the manufacturing of automobiles and its significance in ensuring the safety, reliability, and integrity of contemporary cars. It specifically focuses on emerging vulnerabilities in connected and self-driving vehicles, addressing potential threats to information security, vehicle integrity, and passenger safety. Overall, this paper aims to provide a comprehensive analysis of ESG metrics, IoT applications, and cybersecurity risks in the automotive industry. Its objective is to promote sustainability, efficiency, and safety within the sector.

Keywords

IOT, ESG, car manufacturing, AI

Mapping Machine Learning & Deep Learning with functional areas

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Abstract

Modern technology includes the field of machine learning. Numerous studies have been conducted on the subject of making machines intelligent. Machines can now learn, a capability already found in humans. For the same goal, numerous different strategies have been developed. Numerous application fields have used traditional machine learning techniques. Machine learning algorithms now have a substantially higher accuracy. Once additional component was considered, the idea of deep learning developed. A part of machine learning is deep learning. Up till now, not many deep learning applications have indeed been studied. Deep learning will probably become simpler to use in a number of additional application areas and sub-domains to solve problems. The application areas, sub-domains, and applications for machine learning and deep learning are summarised in this study. Choosing the appropriate methodology that is most appropriate for a certain circumstances by studying & understanding which learning technique (machine learning and deep learning) is best suited with which area is also been discussed in this paper.

Keywords

Deep Learning, Machine learning, Artificial Intelligence, Data Science.

Simulation of various Sensors and Actuators in IoT Embedded Environment for Home Automation using TinkerCAD

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Abstract

The smart house concept refers to integrating technology and automation for controlling and managing various aspects of the home environment. e.g. lighting to adjust to outer light, speed of fan adjusting according to the outer surroundings, or security such as being notified after possible gas leakage. The use of sensors and internet of things devices is a common means to achieve such automation. There are a lot of advantages e.g. better convenience energy efficiency and security which can be obtained by making your home smarter. There are many benefits including more convenience energy efficiency and better safety that can be achieved through the use of intelligent homes smart sensors can learn what one likes and adjust one's temperature at home saving energy and increasing comfort even when one is not home. Smart security systems can keep watch over your house and notify you if there is any danger such as a gas leakage. This paper focuses on using sensors and actuators to create a smart home environment and how to achieve that through experimentation and integrating artificial intelligence and internet of things technologies can be seen by using tinker cad as a simulation tool. Smart sensors learn what one likes and may adjust temperature in one's home, accordingly, saving energy and increasing comfort of one's home. Also, places can be monitored and alerted to potential threats by smart security systems.

EmotiSense: A Mood-based API (Application Programming Interface) System Utilizing Physiological Parameters for Emotional Analysis.

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Abstract

Emotions are one of the driving powers of our lives, affecting various aspects of our lives. This research paper aims to present a mood-based API system that uses physiological parameters like Heart Rate Variability (HRV) and Electrodermal Activity (EDA) to detect and analyse an individual's emotional state by considering the physiological data and subjective responses. The API comprises elements performing data collection from wearable devices, processing it onto a server, and predicting the result in the form of plain data on web-based applications. The web-based application allows users to interact with API and evolve the algorithm. The wearable device records HRV and EDA data in a specific time, which are processed using machine learning algorithms to determine the individual's emotional state. Title: EmotiSense – A Mood-based API System Utilizing Physiological Parameters for Emotional Analysis.

Keywords

Physiological Parameters, ECG, HRV, EDA, GSR

Future Intelligent ERP system

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Abstract

The modern business landscape is marked by complexity, rapid data generation, and the need for real-time decision-making. This article delves into the myriad possibilities of harnessing new advances in technology to craft advanced Enterprise Resource Planning (ERP) solutions poised to meet the evolving demands of contemporary organizations. By putting forward these new possibilities, author hopes to encourage collaborative efforts aimed at developing practical, technology driven solutions that will empower modern organizations to thrive in an ever-evolving business landscape. Furthermore, this paper aims to stimulate critical thinking among researchers in the intersecting domains of AI and ERP by offering tangible use-case scenarios that underscore the prospective advantages.

Analyzing UV Radiation Exposure and Its Impact on Skin Health: A Exploratory Data Analysis

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Abstract

Excessive UV radiation can harm the skin, leading to premature aging, sunburn, and an increased risk of skin cancer. Understanding the relationship between UV radiation levels and skin health is crucial for developing preventative measures and promoting public health. However, this study area remains unexplored due to a lack of data on the frequency of skin disease occurrences. The following research aims to fill this gap by using K-means and Gaussian Mixture Models to create clusters of UV levels with similar weather conditions. Dataset of UV radiations and relevant climatic features for the area of Kuala Lumpur from January 2018 to May 2023 was collected from NASA's Power portal. By thoroughly analyzing experimental results conducted by past researchers or consulting an expert dermatologist, skin diseases at risk in each cluster can be identified. Findings of the following study can therefore enable the community and dermatologists to implement targeted skin disease preventative measures and interventions to protect individuals from the harmful effects of UV radiations.

Keywords

UV Radiations, Skin Diseases, K-means Clustering, Gaussian Mixture Model

