INTERNATIONAL SCHOOL
VIETNAM NATIONAL UNIVERSITY, HANOI

THE 17TH STUDENT RESEARCH CONFERENCE

STUDENT RESEARCH PROJECTS

2024-2025 ACADEMIC YEAR

INTRODUCTION

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"Research is creating new knowledge," Neil Armstrong once said. The mindset of this great scientist reflects that research is not merely a process of exploration, but a journey of generating new knowledge – a journey that is being actively continued and spread by students at VNU–International School.

Scientific research among students not only plays a crucial role in enhancing the overall quality of higher education, but also serves as a valuable environment to cultivate independent thinking, creativity, and a strong sense of responsibility in both study and future careers. It is a journey from textbook knowledge to real-life application, where students are empowered to propose solutions, ask meaningful questions, and seek answers to urgent issues across various fields.

In the academic year 2024–2025, the 17th Student Scientific Research Conference proudly received 139 research projects with the participation of nearly 500 students – almost double the number of students compared to last year. This remarkable growth not only reflects the widespread impact of student research activities across the university, but also demonstrates the increasing depth and quality of each research work. The topics span a wide range of disciplines – from natural sciences, engineering and technology, economics and management, to healthcare, linguistics, and culture – offering fresh perspectives, sharp analyses, and innovative solutions.

We sincerely appreciate the contributions of our dedicated professors, lecturers, and advisors who have guided and supported students throughout their research journey. Their mentorship has been a compass, helping students navigate the complexities of scientific inquiry, overcome challenges, and transform initial sparks of curiosity into meaningful and impactful outcomes.

Thank you to all students for your commitment, enthusiasm, and research spirit. This 17th Student Research Conference Yearbook features selected outstanding projects from the 2024–2025 academic year – as a recognition of achievement and a source of inspiration for future generations to keep the flame of scientific passion burning.

Sincerely./.

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EXPLORING THE RELATIONSHIP BETWEEN AI LITERACY AND CRITICAL THINKING DISPOSITION: A CASE STUDY AT VIETNAM NATIONAL UNIVERSITY, HANOI, VIETNAM

NN.NC.SV.24_01

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Abstract

Although the importance of AI Literacy and Critical Thinking Disposition, as well as their relationship, have been emphasized across existing literature, educational philosophy, and national policies, there is a lack of studies that directly explore this connection. In response to this gap, the current study can be considered one of the first to investigate the relationship between AI Literacy (AIL) and Critical Thinking Disposition (CTD) among Vietnamese undergraduates at Vietnam National University, Hanoi. Students' AI Literacy and Critical Thinking Disposition were assessed using the AILS (Wang et al., 2022) and CTDS-V (Nguyen et al., 2023a) instruments. Based on responses from 469 students, the results show that students demonstrate a high level of AI Literacy but only a moderate level of Critical Thinking Disposition. Furthermore, the study found that AI Literacy has a direct, positive, and significant influence on Critical Thinking Disposition across all its dimensions. Specifically, AI Ethics has the strongest impact, followed by AI Usage and AI Awareness, while AI Evaluation has the weakest effect. These findings underscore the critical role of AI Literacy in fostering students' Critical Thinking Disposition and offer practical recommendations for stakeholders to leverage this relationship in the current academic landscape.

Keywords: AI Literacy, Critical Thinking Disposition, Adolescent, Undergraduates, Education

A CONTRASTIVE ANALYSIS OF NATIVE AND NON-NATIVE BUSINESS HEADLINES

NN.NC.SV.24_03

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Abstract

There is a language specific to the title of business newspapers which assists in providing information in an appealing, clear and an accurate manner. In the same fashion that journalism works, newspaper titles do not only reflect the theme but also the linguistics of the journalist. However, it can be observed that the head of the article by a native speaker is far more different in language compared to a non-speaker. This research seeks to compare and contrast the business headlines which appear in both BBC Business and Vietnam Business Forum with regard to language structure and style of writing revealing both the similarities and the differences.

Keywords: Business headlines, Contrastive analysis, Linguistic features

STUDENT LITERACY AND ENGAGEMENT IN GLOBALIZATION - AN ASSESSMENT AT VNU-IS

NN.NC.SV.24_05

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Abstract

There is an increased demand for educational institutions in the context of advancing globalization to develop students' global citizenship competencies (Deardorff, 2006; Reimers, 2009). The current study sought to analyze students' perceptions on globalization at the International School - VNU and explore the aspects that affect their global awareness and engagement. A structured questionnaire based on validated frameworks was created, including Andreotti's (2006) globalization literacy framework and Steger's (2013) framework, and others' on globalization as an economic, political, social, and environmental system of interdependence. 110 undergraduate students from 15 different majors were surveyed as part of a cross-sectional study. Stata was used for data analysis, with descriptive statistics and regression analyses performed to examine relationships among students' knowledge and competencies such as digital literacy, intercultural communication, critical thinking paired with academic major, and demographic information. Findings showed that there was a high degree of interest in global issues (84.5%) and high levels of active digital participation (76.3%) among students. On the other hand, there were significant gaps in problem-solving as well as in intercultural communication skills, particularly in students from non-social science disciplines, highlighting the need for experience.

Keywords: Global citizenship competencies, Globalization awareness, Intercultural communication, Undergraduate students

THE EFFECTIVENESS OF WATCHING ENGLISH MOVIES IN ENHANCING LISTENING COMPREHENSION

NN.NC.SV.24_06
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Abstract

This study was conducted to explore the effectiveness of using English-language movies as a language learning strategy for improving students' listening comprehension skills. The research offers a comparison between two approaches: an organized self-study program using English videos and a traditional learning method, with the aim of building an evidence-based foundation for drawing conclusions about improvements in students' listening abilities. The research methodology was designed based on general listening comprehension theories and theoretical frameworks on the use of English films in language learning, as drawn from previous studies. A mixed-methods approach combining both qualitative and quantitative methods was employed, with data collected from English Language (BEL) students at the VNU – International School who had not yet achieved the B2 level, which is a prerequisite for enrolling in the major. Data were gathered through pre- and post-intervention listening tests and a structured survey. Participants were divided into two groups: the experimental group, which participated in a structured film-based learning program, and the control group, which engaged in self-study without videos. Quantitative analysis was conducted using data obtained from small-scale tests administered at the end of each session in the experimental group. In addition, the qualitative data provided insights into influencing factors and evaluations that highlighted the effectiveness of using English-language films as part of students' self-directed learning strategies, as evidenced by surveys conducted with experimental participants. The findings reveal that the experimental group made significantly greater progress compared to the control group, as reflected in the marked improvement in post-intervention test scores and the positive changes in students' attitudes toward using English videos to enhance their listening skills. For future development, the study recommends conducting longitudinal research, performing genre-specific analyses, and designing adaptive learning models to optimize the effectiveness of this method.

Keywords: Listening Comprehension, English as a Foreign Language (EFL), Second Language Acquisition (SLA), Movie-Based Learning, Cognitive Engagement, Experimental Research, Subtitle Processing.

AN INVESTIGATION OF THE 1ST-MAJOR STUDENT' PERCEPTION OF THEIR MOTIVATION AND AUTONOMY IN ENGLISH SPEAKING LESSON: A CASE STUDY AT VNU-IS

NN.NC.SV.24_07

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Advisor: Assoc. Prof. Dr. Hoang Tuyet Minh

Abstract

First-year English major students at VNU-International School (VNU-IS) undergo investigation to determine their motivational factors and self-directed learning capabilities regarding their speaking abilities development. Learner motivation along with learner autonomy has received thorough research attention in second language acquisition but their simultaneous impact remains limited in studies about university freshman students within the Vietnamese higher education system. The study targets the unknown area by analyzing university students who sync their motivations with autonomous speaking behaviors during English classes. A mixed-methods approach was adopted. The researcher conducted semi-structured interviews with five students who displayed the most noticeable patterns based on their survey results. The mixture of survey instrumentation provided researchers with extensive and detailed examination possibilities. The study revealed that students received motivation from both internal factors and external factors. . Students exhibited different levels of independence when performing their actions. Some students showed high self-direction but numerous others needed instructions from teachers and regular classroom structure to progress. This study demonstrates the necessity of teaching approaches that unite learner self-direction with motivational development. Mature language teachers must establish educational spaces which foster student commitment while providing structured communication activities that help students build independent learning approaches. The study presents useful instructions for teaching professionals who want to boost student English language performance and long-term development by implementing autonomous learning methods.

Keywords: learner autonomy, motivation, speaking skills, English language, intrinsic and extrinsic motivation, language learning strategies

OVERCOMING OBSTACLES: ENGLISH LANGUAGE STUDENT'S DIFFICULTIES IN LEARNING TRANSLATION COURSES AT VNU-IS AND STRATEGIES FOR STUDENTS

NN.NC.SV.24_08

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Advisor: Dr. Nguyen Thi Thu Huyen

Abstract

This research aims to explore the challenges faced by English language students in translation courses at VNUIS, with a focus on linguistic, cultural, and psychological barriers. A key feature of this study is its mixed-methods approach, combining quantitative surveys and qualitative analysis of translation exercises to provide a comprehensive understanding of these obstacles. By identifying specific difficulties and their impact on learning outcomes, the study seeks to propose effective strategies to enhance translation pedagogy. To achieve this, the research involves 62 students enrolled in translation courses at VNUIS. Quantitative data is collected through surveys using a Likert scale, while qualitative data is derived from analyzing students' in-class translation exercises. This dual approach allows for an in-depth examination of both perceived and actual challenges in translation learning. Data is analyzed using statistical tools for quantitative responses and thematic coding for qualitative insights. The combination of these methods ensures a robust evaluation of the barriers students encounter in translation studies. The findings indicate that linguistic barriers, particularly vocabulary limitations and grammatical challenges, have the most significant impact on students' translation abilities, followed by cultural and psychological factors. By examining both the challenges and the coping strategies employed, this study offers valuable insights into how to better support students in overcoming the barriers they face in translation courses. The study reveals that psychological barriers exert the greatest influence on students' translation performance, followed closely by cultural and linguistic challenges, highlighting the need for an integrated support approach in translation education.

Keywords: Translation challenges, linguistic barriers, cultural barriers, translation learning, mixed-methods research, learning strategies

INVESTIGATION OF AI TOOL IMPACT ON SELF-DIRECTED LEARNING FOR SPEAKING SKILL AMONG ENGLISH MAJOR STUDENTS AT VNU - INTERNATIONAL SCHOOL

NN.NC.SV.24_09

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Advisor: MA. Nguyen Tri Trung

Abstract

The increasing interest in Artificial Intelligence (AI) in language education over the past few years has not yet included research into the impact of AI tools for SDL, specifically regarding speaking skill development for English major students. With this issue, this study explores the relationship between AI tool use and SDL development, primarily for speaking skills, among English major undergraduate students at Vietnam National University – International School. The study is based on Garrison's Model of Self-Directed Learning (1997) which refers to self- management, self-monitoring, and motivation and incorporates the Technology Acceptance Model (Davis, 1989) which relates to perceived usefulness and perceived ease of use. A mixed-method design included quantitative surveys and qualitative interviews to collect data from English major students. Based on the responses from 100 participants, the results suggest that students who are more highly motivated and better at self-monitoring tend to make more effective and frequent use of AI tools, particularly when they can see the tools as supportive and easy to use. This suggests that technology acceptance may be a critical element for improving learners' autonomy and communicative competence in English. The findings provide relevant discussion and recommendations for education, curriculum, and edtech developers who are hoping to put AI into language education.

Keywords: AI Tools, Self-Directed Learning, Speaking Skills, English Majors, Technology Acceptance, Motivation, Self-Monitoring, Higher Education.

A COGNITIVE LINGUISTICS ANALYSIS OF TIME METAPHORS IN ENGLISH AND VIETNAMESE SET EXPRESSIONS

NN.NC.SV.24_10

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Advisor: Assoc. Prof. Dr. Hoang Tuyet Minh

Abstract

This research explores the role played by traditional metaphors in determining the conceptualization of time by Vietnamese and English speakers. The research examines how the metaphors reflect the underlying cultural values as well as cognition patterns within a language. Even though conceptual metaphor studies abound in huge amounts of research (e.g., Lakoff & Johnson), not yet is their interrelation to cultures and their representations of time using metaphors discovered. While other research has researched metaphors in general, few have researched cross-cultural comparison of time metaphors between Vietnamese and English, particularly regarding how the metaphors function in the social and cultural lives of each language. The purpose of this research is to fill this gap by contrasting time-related metaphors in the two languages with both quantitative and qualitative methods. The study employs a corpus-based approach to find and classify metaphors and subsequently through qualitative interviews and questionnaires to determine their cultural implications. By doing this, the research not only investigates what type of metaphors are employed but also what type of similarities and differences exist in the conceptualization of time across cultures. The findings show that while both Vietnamese and English think about time using metaphors, the words convey different cultural inclinations. English metaphors, for example, are likely to conceive time as a commodity ("spending time"), whereas Vietnamese metaphors highlight cyclical and harmonious aspects of time. These findings suggest that metaphorical language is highly entrenched in cultural values and has the potential to significantly influence the perception of people across cultures concerning and interacting with time. This research has serious implications for language learners, teachers, and translators. Knowledge of metaphors used in each language strengthens understanding and communication, particularly in Vietnamese speakers' teaching English and English speakers' teaching Vietnamese. This research also gives insights into cultural sensitivities that may guide translation policy and uncovers possible mistakes in cross-cultural communication.

Key words: Cultural Differences, English language, Hidden similarities, Linguistic anthropology, Socio-economic context, Time, Traditional metaphor, Vietnamese language

SEMANTICS AND SEMANTIC TRANSFORMATION OF THE OPPOSITE PREPOSITION PAIRS IN-OUT, UP-DOWN, ABOVE-BELOW IN ENGLISH

NN.NC.SV.24_11
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Abstract

This study investigates the semantic structures and transformations of three pairs of opposite English prepositions—in–out, up–down, and above–below—with the aim of understanding how their meanings have evolved over time and how they function in modern English. Adopting a mixed-methods approach, the research combines qualitative analysis, informed by cognitive and historical linguistic theories, with quantitative data drawn from major English dictionaries and linguistic corpora such as COCA and BNC. Definitions and usage examples were extracted, categorized into semantic types (spatial, metaphorical, abstract), and analyzed for evidence of semantic change processes such as broadening, narrowing, and metaphorical extension. The findings reveal consistent patterns of semantic expansion, particularly from literal spatial meanings into more abstract and metaphorical domains, reflecting cognitive conceptualizations in English. These results highlight the dynamic nature of prepositional meaning and contribute to a deeper understanding of semantic evolution, offering insights relevant to fields such as lexicography, language teaching, and cognitive semantics.

Keywords: English Prepositions, Semantic Change, In–Out, Up–Down, Above–Below, Cognitive Linguistics, Metaphor, Corpus Analysis.

SMART CLASSROOM INSIGHTS SYSTEM: BEHAVIOR ANALYSIS, AUTOMATED ATTENDANCE, LEARNING CHATBOT, EMOTION DETECTION FOR VNUIS TEACHERS

CN.NC.SV.24_01

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Advisor: Dr. Kim Dinh Thai

Abstract

This study introduces an integrated system leveraging computer vision and artificial intelligenceto enhance classroom management through automated and intelligent functionalities. The sys-tem comprises four synergistic modules designed to streamline administrative tasks and provide actionable insights for educators. The behavior analysis module employs state-of-the-art YOLO models to assess student actions and postures, offering objective insights into engagement and classroom dynamics. The automated attendance module utilizes a FaceNet-based model, po-tentially a lightweight variant, paired with facial detection to identify students and export at-tendance records to Excel files, simplifying record-keeping. An AI chatbot assistant enables instructors to query student information and extract data or summaries from uploaded PDF documents, such as syllabi or lecture notes, facilitating rapid information retrieval. The emo-tion recognition module analyzes students' facial expressions to infer emotional states, such as confusion or engagement, enhancing educators' understanding of student well-being and recep-tiveness. By automating attendance, providing real-time feedback on behavior and emotions, and offering on-demand information access, this multi-faceted system reduces administrative burdens, enables timely teaching adjustments, and fosters a responsive learning environment, demonstrating the potential of AI-driven solutions for modern classroom challenges.

Keywords: computer vision, behavior analysis, YOLO, attendance automation, FaceNet, emotion recogni- tion, chatbot, PDF data extraction, educational technology, classroom management

DEVELOPING A CROSS-MODAL SYSTEM TO GENERATE MUSIC FROM VISUAL INPUTS VIA NEURAL ODES FOR SOCIAL MEDIA SHORT VIDEOS

CN.NC.SV.24_02

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Abstract

The rapid proliferation of short-form video platforms has underscored the need for effective background music selection to enhance viewer engagement, a task complicated by vast music libraries and the challenge of matching emotional tone. This research introduces "MoodFlow," a novel cross-modal music recommendation system that leverages deep learning to align visual content with mood-appropriate soundtracks. We fine-tuned the Qwen2.5-VL-3B vision-language model using QLoRA on the ArtEmisv2 dataset to generate precise emotional descriptions from video frames. These descriptions are transformed into visual-emotion embeddings, which are mapped to a song embedding space via CNFs and Neural ODEs. This flow-based approach models non-linear transformations between multimodal distributions, ensuring semantic alignment of visual and auditory cues. A diversity-enhancing soft clustering mechanism further refines recommendations by balancing relevance and genre variety, experiments demonstrate that MoodFlow achieves a query processing time of 2-5 seconds on GPU hardware, with qualitative assessments revealing high emotional resonance in recommended soundtracks. This work advances automated content creation by offering a scalable, mood-aware solution with potential applications in enhancing user experiences across video-sharing platforms.

Keywords: Mood-based Processing, NeuralODEs, CNFs, Music Recommendation, QLoRa, Qwen2.5

APPLICATION OF AI AND IOT FOR SMART HOME SYSTEMS

CN.NC.SV.24_03

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Advisor: Dr. Kim Dinh Thai

Abstract

This research presents the design and implementation of an advanced smart home system, deeply integrating the Internet of Things (IoT) and Artificial Intelligence (AI) to enhance automation, security, and user experience. The system embeds IoT mod- ules into household appliances (lights, curtains, fans) and utilizes a sensor network for environmental monitoring (air quality, temperature, humidity), enabling automated responses such as dehumidification and fire alerts. Flexible control mechanisms include direct interaction and a two-way Bluetooth mobile application developed using the MIT App Inventor platform. A core focus is the application of AI to augment system intelligence through features including facial recognition for access control, voice command for devices and media services (YouTube, Spotify), and an interactive chatbot for system management. The successful functional prototype demonstrates effective AI and IoT integration, creating a highly automated, secure, convenient, and user-centric living envi- ronment.

Keywords: Smart Home, Internet of Things (IoT), Artificial Intelligence (AI), Home Automation, Intelli- gent Systems, Embedded IoT, Environmental Sensing, Bluetooth Control, MIT App Inventor, Streamlit, Facial Recognition, Voice Control, Chatbot, System Integration.

SMART AUTONOMOUS VEHICLE DESIGN USING ARTIFICIAL INTELLIGENCE

CN.NC.SV.24_06

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Advisor: Dr. Kim Dinh Thai

Abstract

This research presents an integrated approach to autonomous vehicle design utilizing artificial intelligence, focus- ing on the development of a Mecanum-wheeled mobile robot platform with advanced perception and navigation capabilities. The study addresses critical challenges in autonomous navigation through a multi-layered system architecture that combines precise kinematic modeling for omnidirectional motion, LiDAR-based Simultaneous Localization and Mapping (SLAM) using Hector SLAM, and sophisticated ensemble-based computer vision tech- niques for perception. A comprehensive perception pipeline is implemented, incorporating multiple state-of-the-art object detection models (including HyperYOLOv1.1, RT-DETR/v2, D-FINE, YOLOv11), enhanced through im- age preprocessing techniques (CLAHE, LightenDiffusion) and Test-Time Augmentation (TTA). This research contributes to advancing autonomous vehicle technology by effectively bridging theoreti- cal frameworks (kinematics, control, AI) with practical implementation, particularly addressing the integration of real-time perception and control in dynamic, real-world scenarios on an affordable, scalable prototype.

Keywords: Autonomous vehicles, artificial intelligence, computer vision, Mecanum wheels, SLAM, multi- model fusion, object detection, kinematic modeling, PID control, omnidirectional robots, Weighted Box Fusion (WBF), Jetson TX2.

FAULT TOLERANT CONTROL FOR UNCERTAIN PERTUBED ENGINEERING SYSTEMS AND APPLICATIONS

CN.NC.SV.24_08

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Advisor: Dr. Pham Ngoc Thanh

Abstract

The need for fault-tolerant control (FTC) in engineering systems has grown significantly due to uncertainties, external disturbances, actuator degradations, and time-delay effects. These factors can degrade system performance or even cause instability if not properly addressed. Modern control strategies must therefore ensure both stability and performance under a variety of fault conditions. This study focuses on robust FTC for uncertain and perturbed linear dynamical systems. By integrating Lyapunov theory, Linear Matrix Inequalities (LMIs), and full-state feedback control, a unified framework is proposed to design controllers capable of handling different fault types. • Chapter I – Independent Faults: Deals with robust control for systems affected by independent faults and disturbances using LMI-based stability conditions. • Chapter II – Actuator Faults: Develops control strategies to maintain stability despite actuator malfunctions, with comparisons to traditional methods. • Chapter III – Parameter Variation: Focuses on systems with changing parameters due to aging or modeling errors, and designs robust controllers accordingly. • Chapter IV – Time-Delay Faults: Extends the robust control framework to address faults combined with time-delay effects. By addressing these four fault categories, the study builds a flexible and reliable control framework suitable for real-world engineering systems. It offers practical tools and insights for designing fault-tolerant controllers applicable in fields such as industrial automation, aerospace, and robotics.

Keywords: H∞ control, linear system, actuator faults, parameter uncertainties, time-delay system

ASSISTIVE DEVICE FOR VISUALLY IMPAIRED INDIVIDUALS

CN.NC.SV.24_09

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Advisor: Assoc. Prof. Dr. Nguyen Thanh Tung

Abstract

This report presents the design and development of a low-cost, wearable assistive device for individuals with visual impairments. The device integrates a suite of sensors, including the HC-SR04 ultrasonic sensor, GY-521 accelerometer, GY-GPSV3-NEO7M GPS module, 5V Buzzer (12x9.07mm), and the SIM800A GSM GPRS Mini Module. It utilizes an Arduino UNO R3 CH340G micro-controller to provide real-time navigation, safety alerts, and emergency communication features. The device offers auditory feedback, fall detection, GPS tracking, and automated SOS messaging. Preliminary testing indicates positive usability and reliability, laying a foundation for scalable assistive technology solutions.

Keywords: Assistive technology, Visual impairment, Navigation device, Fall detection, Sensor integration

MACHINE LEARNING APPLIED SUPERVISORY ASSISTANT CAMERA SYSTEM

CN.NC.SV.24_10

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Advisor: MSc. Bui Thanh Tung

Abstract

This research introduces the development of a Windows-based surveillance application that integrates the YOLOv8 (You Only Look Once) object detection model and a speech recognition engine, aiming to provide real-time object identification and voice-command interaction. In addition, the system incorporates the design of Internet of Things (IoT) devices dedicated solely to receiving and transmitting warning signals. These devices serve as an extension of the application, enabling immediate responses to detected threats or predefined events. A significant part of the study involves constructing a custom dataset used to train the YOLO model, optimizing its ability to recognize specific objects with higher speed and accuracy. The overarching goal is to build a surveillance solution that offers high efficiency, real-time capabilities and user-friendly operation. The proposed system is expected to significantly improve monitoring processes and provide adaptable applications for real-world challenges, especially within industrial and operationally intensive settings.

Keywords: YOLO, speech recognition, IoT warning device, object detection, surveillance system

DEVELOPING MACHINE LEARNING FOR MICROCONTROLLER CN.NC.SV.24_11

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Advisor: Dr. Nguyen Dang Khoa

Abstract

The field of Artificial Intelligence is rapidly evolving and gradually becoming an indispensable part of modern life. However, despite continuous improvements in the accuracy of deep learning models, deploying them on IoT devices and mobile platforms with limited hardware remains a significant challenge. Complex models are often too large and consume excessive resources to operate efficiently on compact microcontrollers such as the Arduino Nano 33 BLE. Quantization has emerged as an optimal solution, enabling substantial model compression while simultaneously reducing latency and accelerating inference speed without sacrificing much accuracy. This research focuses on applying Post-Training Quantization techniques to optimize popular models such as MobileNet, MobileNet V2, and SequenceNet, aiming for efficient deployment on resource-constrained microcontrollers like the Arduino Nano 33 BLE. The results demonstrate that the proposed quantization techniques not only maintain high performance but also significantly enhance inference speed and memory efficiency. These successes unlock great potential for the widespread adoption of deep learning models in embedded systems and microcontroller-based devices, thereby accelerating the development of artificial intelligence applications in resource-constrained environments.

Keywords: AI, Quantization, microcontroller

HAPTIC BILATERAL TELEOPERATION SYSTEMS

CN.NC.SV.24_13

Students:

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Abstract

This topic focuses on the research and development of a mobile robot control system using the Novint Falcon haptic device in the ROS environment. The main goal is to build a two-way information transmission model between the haptic control device and the mobile robot to perform teleoperation with tactile feedback. In the topic, the concepts of mobile robots, ROS operating system, RPLidar library, and Libnifalcon library are presented in detail. The hardware structure of the Novint Falcon device and the mobile robot is also described specifically. The control system is established by mapping the logical position of the Falcon handle to the robot control parameters in the xOy coordinate system. ROS nodes are developed to send and receive data through ROS Topics, ensuring communication between components. The experiment was conducted to test the ability to remotely control a mobile robot through the Falcon device, and sense force feedback based on the distance to the obstacle. The results showed that the system operated stably, and the force feedback was displayed accurately according to the distance to the obstacle. The topic opens up a development direction for remote control applications in dangerous, complex or difficult-to-access environments.

Keywords: Haptic, Mobile Robot, Novint Falcon, Teleoperation, ROS, RPLidar.

RESEARCH ON SOLUTIONS TO OPTIMIZE VOICE OPERATIONS THROUGH AI VIRTUAL ASSISTANTS TO SUPPORT THE ELDERLY IN USING TECHNOLOGY APPLICATIONS

CN.NC.SV.24_14

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Duong Ngo Nhat Minh	AIT2022B	22070224

Advisor: Dr. Kim Dinh Thai

Abstract

In the context of increasing aging populations worldwide, developing accessible and user-friendly technologies for older adults has become a pressing priority. This study introduces an AI-based voice assistant specifically designed to support Vietnamese elderly users in daily tasks and promote digital inclusion. The system was developed using voice samples collected from elderly individuals with diverse regional accents, along with commonly used voice commands. Key components include customized speech-to-text (STT) and text-to-speech (TTS) models, integration of Vietnamese natural language processing (NLP) techniques capable of handling informal and grammatically incorrect speech, and a simplified user interface optimized for elderly accessibility. viii Prototype testing with a sample group of elderly users demonstrated high recognition accuracy, even in the presence of weak voices and regional dialects. The TTS module delivered slow-paced, clear responses, which were well received by participants. Usability evaluations revealed increased user confidence in interacting with technology, though some challenges were noted in noisy environments. The research highlights the potential of voice-activated assistants in enhancing healthcare access, facilitating everyday activities, and reducing digital exclusion among the elderly. Notable contributions include a user-centered design framework, refined Vietnamese voice data resources, and a scalable AI system architecture. Future work is recommended to expand dialectal coverage, integrate machine learning for better context understanding, and develop a mobile version of the application. The findings also suggest policy implications in supporting inclusive digital tools within national aging strategies.

Keywords: Artificial Intelligence (AI), Voice Assistant, Elderly Users, Vietnamese Language, Natural Language Processing (NLP)

APPLYING 3-DOF ROBOT ARMS AND COMPUTER VISION IN CLASSIFYING PRODUCT

CN.NC.SV.24_15

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Advisor: MSc. Bui Thanh Tung

Abstract

The automation of object manipulation using robotic arms has gained significant attention in industrial and logistics applications. This research presents the development of a three- degree-of-freedom robotic arm for object grasping and classification using computer vision and inverse kinematics. The system integrates a webcam for real-time object detection and localization, utilizing image processing techniques to extract object positions. The extracted coordinates are then processed through forward and inverse kinematics calculations to determine the required joint angles for precise movement. The robotic arm is controlled via an embedded system, which processes the computed joint angles and executes corresponding movements to ensure accurate grasping and placement. The communication between the computer and the microcontroller ensures seamless execution of commands. The effectiveness of the system is evaluated through experimental trials, measuring accuracy, response time, and successful classification rates. The results demonstrate that the proposed approach effectively automates object recognition and handling, contributing to the advancement of intelligent robotic systems in manufacturing, warehousing, and logistics applications.

Keywords: Robotic Arm, Computer Vision, Object Classification, Robot Kinematics, Embedded System.

FLEXIBLE WAREHOUSE DEVELOPMENT RESEARCH: RESEARCH ON EMERGENCY RESPONSE SOLUTIONS AND IMPROVING LIFE EFFICIENCY

CN.NC.SV.24_16

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Advisor: Assoc. Prof. Dr. Nguyen Nhu Tung

Abstract

In an era marked by increasing uncertainties and frequent emergencies, the role of flexible warehouse systems has become more critical than ever. This research explores the development of adaptable warehouse infrastructures that can respond effectively to emergencies such as natural disasters, pandemics, and supply chain disruptions. The study proposes a framework that integrates smart technologies, modular design, and dynamic logistics strategies to enhance the responsiveness and efficiency of warehouse operations. Furthermore, it examines the broader impact of such systems on daily life, focusing on their contribution to improving living standards through timely delivery of essential goods and services. By aligning technological innovation with human-centered design, this research aims to support resilient supply networks and contribute to overall life efficiency in urban and rural contexts alike.

Keywords: Flexible Warehousing, Emergency Response, Smart Logistics, Modular Design, Supply Chain Resilience, Technological Innovation, Life Efficiency.

PRUNED AND QUANTIZED NETWORK FOR EGG QUALITY CLASSIFICATION ON EDGE DEVICES

CN.NC.SV.24_17

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Advisor: Dr. Kim Dinh Thai

Abstract

This paper presents an edge-optimized cost-sensitive learning network for egg quality control using YOLOv5-seg variants combined with PAGCP. In this paper, we developed a comprehensive dataset of 660 egg images captured under con- trolled conditions, encompassing four classes: 5-day eggs, 15-day eggs, cracked eggs, and broken eggs. Our experimental results demonstrate exceptional perfor- mance across model variants, with the Yolov5m-seg variant achieving 98.80% pre- cision and 97.30% mAP@50 for both object detection and instance segmentation tasks at 10% pruning. Notably, larger architectures maintained robust performance even at 40% pruning, with the Yolov5xseg retaining 89.90% mAP@50. The pro- posed approach gives a balanced model of efficiency and accuracy, making it suit- able for industrial deployment in resource-constrained environments. Additionally, this paper provides solutions for automated egg quality assessment by offering a robust, efficient, and deployable solution for real-world applications.

Keywords: Egg Quality, Cost-sensitive Learning, PAGCP, Edge Device, Instance Segmen- tation

STOCK PRICE FORECASTING IN VIETNAM USING LSTM AND XGBOOST: A COMPARATIVE STUDY

CN.NC.SV.24_18

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Advisor: Dr. Le Xuan Hai

Abstract

Study The prediction of stock prices remains a critical and challenging task in the financial domain due to the volatile and non-linear nature of markets. This study investigates the separate applications of Long Short-Term Memory (LSTM) networks and Extreme Gradient Boosting (XGBoost) models to forecast stock prices in Vietnam's stock market, focusing on three representative companies: HPG (steel), FPT (technology), and VNM (dairy). By leveraging LSTM's ability to capture temporal dependencies and XGBoost's strength in analyzing structured features, this research aims to evaluate the predictive performance of each model individually. The methodology involves comprehensive data preprocessing, including cleaning, normalization, and feature extraction, followed by independent model training and evaluation. This study highlights the strengths and limitations of LSTM and XGBoost as standalone models for stock price prediction. It contributes to the understanding of machine learning applications in financial forecasting and offers practical implications for investors and financial analysts in emerging markets like Vietnam. Limitations and future research directions, including the exploration of hybrid approaches and the incorporation of external factors such as market sentiment, are also discussed.

Keywords: Stock Price Prediction, LSTM, XGBoost, Vietnam Stock Market, Financial Forecasting, Machine Learning, Time Series, Model Evaluation

EMOTION RECOGNITION APP FOR USER USING COMPUTER VISION AND SPEECH PROCESSING TECHNIQUES

CN.NC.SV.24_20

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Abstract

This study proposes an emotion recognition system based on computer vision and artificial intelligence chatbot using YOLOv12 and API by gemini 1.5 flash pro, utilizing facial analysis to develop an emotional assistant ca- pable of natural interaction with users. The results demonstrate exceptional accuracy, with an mAP@0.5 score exceeding 94.1% and mAP@0.5:0.95 score exceeding 85.1% in the test set. The system operates efficiently in real-time on web platforms and some functions on the Android application ”EVision,” leveraging TensorFlow Lite to ensure on-device processing and user data privacy. 7 8 The intuitive interface supports emotion recognition from images, videos, and live camera feeds, while incorpo- rating personalized feedback. Moreover, AI chatbot is also added to realtime webcam detect that make a friendly conversation between user and computer. It makes computer can understand user’s emotion. Consequently, the system shows significant potential for widespread applications in fields such as human-machine interaction, mental healthcare, and support for the visually impaired. The integration of multimodal approaches lays the foundation for an emotion interaction system that is personalized, natural, and human-centered.

Keywords: Emotion recognition, Computer vision, Artificial Intelligence, YOLOv12, CNN, Real-time processing

AI SYSTEMS USED FOR UAVS AND DRIVERLESS AIRCRAFT

CN.NC.SV.24_21

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Advisor: Dr. Nguyen Dang Khoa

Abstract

In an era of rapid technological advancement and growing security challenges, the integration of Artificial Intelligence (AI) into Unmanned Aerial Vehicles (UAVs) has become a transformative approach in enhancing military operations. This research investigates the application of AI—particularly machine learning, deep learning, and computer vision—in enabling UAVs to autonomously perform military tasks such as reconnaissance, surveillance, and real-time battlefield data analysis. By adopting models like YOLO for object detection and incorporating autonomous navigation algorithms, the study aims to improve UAVs' decision-making capabilities in complex and high-risk environments. The research employs a simulation-based methodology to evaluate UAV performance, focusing on object recognition accuracy, responsiveness, and autonomous functionality under challenging terrain and conditions. Through this approach, the study addresses key objectives: increasing UAV operational efficiency, reducing human exposure to danger, and enhancing the speed and precision of intelligence collection. The findings highlight the potential of AI to redefine modern military strategy by enabling intelligent, adaptive UAV systems. This work contributes to both technological innovation and strategic defense planning, offering valuable insights for researchers, defense technology developers, and policymakers seeking to harness AI in future combat systems while also considering ongoing challenges related to safety, ethics, and reliability.

Keywords: AI, UAVs, Object Detection, YOLO, Military Applications, Autonomy, Computer Vision.

WASTE CLASSIFICATION BASED ON COMPUTER VISION

CN.NC.SV.24_23

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Advisors: MSc. Do Tien Thanh, Dr. Pham Ngoc Thanh

Abstract

This paper is based on the research process of applying the YOLO model in the identification and classification of waste. In the self-collected dataset, we tested 3 versions: YOLOv8, YOLOv11 and YOLOv12. The test results show that all three models have a fairly high average accuracy of about 74-76 % mAP@0.5 to identify and classify waste types in the test data set, low error rate, and stable performance. Through the research, the reader can see the great uses of artificial intelligence in general and the YOLO model in particular in the field of waste identification and classification. Therefore, this research can become a reference for future research on the application of computer vision in image identification and classification.

Keywords: YOLO, Waste Identification, Waste Classification, Computer Vision, AI, mAP@0.5, Image Classification

DEVELOPMENT OF AI ALGORITHM TRACKING OBJECT BASED ON THE LIDAR

CN.NC.SV.24_25

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Advisor: Dr. Nguyen Dang Khoa

Abstract

Object tracking is a fundamental task in robotics and autonomous systems, enabling robots to navigate and interact with dynamic environments effectively. This study focuses on developing an artificial intelligence (AI)-based tracking algorithm utilizing 2D LiDAR data to enhance the accuracy and efficiency of mobile robot navigation. The proposed approach employs machine learning techniques, specifically the Random Forest algorithm, to analyze LiDAR point cloud data and track moving objects in real time. The system is implemented on a Raspberry Pi 3, which processes LiDAR data and directly controls a mobile robot without an intermediary motor controller.The algorithm extracts key features from LiDAR data, such as distance patterns and object motion trajectories, to classify and track objects effectively. The results indicate that the proposed AI-driven tracking system can successfully identify and follow moving objects with high reliability, even in cluttered environments. Furthermore, the system demonstrates adaptability to changes in object speed and movement direction, ensuring robust real-time tracking. This research contributes to improving object tracking in mobile robotics, with potential applications in autonomous navigation, surveillance, and human-robot interaction. By leveraging LiDAR data and machine learning, this approach enhances the robot's ability to perceive and respond to its surroundings, paving the way for more intelligent and autonomous robotic systems. Future work will explore optimizing the algorithm for higher computational efficiency and integrating additional sensor modalities to improve tracking accuracy.

Keywords: Object Tracking, LiDAR, Mobile Robotics, AI, Random Forest, Autonomous Navigation, Real-Time Tracking, Machine Learning.

RESEARCH AND DESIGN OF A FALL DETECTION A SYSTEM FOR THE ELDERLY USING WEARABLE-DEVICES WITH INTEGRATED MULTI-SENSORS

CN.NC.SV.24_26

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Advisor: Dr. Nguyen Ngoc Linh

Abstract

With the global population aging, falls represent the primary cause of injury and mortality for those over 65, necessitating prompt detection and treatment. Our research developed a system to identify falls and activities of daily living (ADL) using sliding window data division, optimal feature extraction, and machine learning algorithm Random Forest (RF). The RF model achieved ~99% accuracy on self-constructed datasets, evaluated through accuracy, precision, negative predictive value, and recall metrics on both public and real-time data. The effectiveness of the method is evaluated through the accuracy (Acc), precision (Pre), negative predictive value (NPV), and recall (Re) indicators, which are then evaluated based on public data files and real-time data. The research results open up the prospect of wide application in smart monitoring systems at home and elderly care facilities, contributing to improving the quality of life and minimizing risks for the elderly in the context of today's aging society.

Key words: Machine Learning, features, accelerometer, classification, Wifi, HAR.

MONITORING INTERCONNECTED SYSTEMS AND APPLICATIONS
CN.NC.SV.24_28

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Advisors: Dr. Pham Ngoc Thanh, Dr. Nguyen Thanh Dong

Abstract

The problem of introduces a method for designing centralised and decentralised state feedback with output feedback controllers for linear interconnected systems. By incorporating the system into the cost function to calculate the controller parameters. The study consists of five main sections: The first section discusses the centralised feedback controllers through the Lyapunov function to find the conditions for the parameter matrices RQ, to ensure the stability of the closed-loop system through the Riccati algebraic equation. The second section, through the matrix RQ, in the section before to find a matrix L which made the system decentralised stable with the given satisfactory error. In the last section, we propose the development of a power system model integrated with a Thyristor-Controlled Phase Shifter (TCPS). The proposed algorithm is applied to a specific linear system through an example using MATLAB software.

Keywords: Interconnected dynamic systems, Decentralised controllers, Centralised controllers, LQR, robust controller, Riccati equation, Lyapunov stability, TCPS.

RESEARCH ON DUAL ARM CONTROL IN REAL-TIME DOMAIN USING MATLAB/SIMULINK AND MICROCONTROLLER

CN.NC.SV.24_30

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Abstract

The study investigates and implements a coordinated-motion control system for a planar dual-arm robot, where each arm has two degrees of freedom, so that a rigid object can follow a specified planar trajectory. A position-based PID controller is designed and simulated in MATLAB/Simulink, then automatically converted to code and uploaded to an Arduino microcontroller, enabling a Rapid Control Prototyping (RCP) workflow. Experiments confirm sta- ble trajectory tracking with low latency and high accuracy. The prototype runs reliably, responds quickly, and achieves precise control even with low-cost hardware. Although the team has laid the theoretical groundwork for a Hardware-in-the-Loop (HIL) setup, they have not yet deployed it because inex- pensive microcontrollers lack the processing speed and exhibit latency that falls short of Simulink's real-time requirements. Nevertheless, the project demonstrates the feasibility of low-cost, real-time robot control and lays a solid foundation for future work on force control, state observers, and adaptive control. The student who carried out the project gained comprehensive skills in modeling, real-time control programming, and embedded-system integration.

Keywords: Dual-Arm Robot, Coordinated Motion, PID Controller, Rapid Control Prototyping, MATLAB/Simulink, Arduino, Trajectory Tracking, Real-Time Control, Low-Cost Hardware.

APPLICATION OF REINFORCEMENT LEARNING FOR THE DEVELOPMENT OF STABILITY IN BALL AND BEAM SYSTEMS

CN.NC.SV.24_31

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Abstract

The Ball and Beam system is a well-known benchmark problem in control engineering due to its nonlinear and unstable dynamics. Traditional control methods such as PID and fuzzy logic controllers have been extensively used to stabilize the system, but they often require manual tuning and struggle to adapt to changing system dynamics. In this research, we propose the application of Deep Q-Learning (DQL), a reinforcement learning (RL) approach, to autonomously learn an optimal control policy for the Ball and Beam system. The DQL algorithm combines Q-learning with deep neural networks to approximate the optimal action-value function, allowing the agent to generalize across a continuous state space. Unlike conventional Q-learning, which is limited to discrete states and actions, DQL leverages function approximation techniques to enable learning in complex environments. Our results demonstrate that DQL effectively stabilizes the system, reduces steady-state error, and enhances adaptability in real-time control scenarios. Compared to conventional Q-learning, the DQL-based controller exhibits improved convergence speed and robustness to external disturbances.

Keywords: Deep Q-Learning, Reinforcement Learning, Ball and Beam System, Optimal Control, Function Approximation

KINEMATIC MODEL OF MECANUM-WHEELED MOBILE ROBOT AND USING CLASSICAL CONTROL COMMUNICATIONS TOGETHER WITH FEED FORWARD ALGORITHMS FOR EMBEDDED ROBOT ENVIRONMENTAL MONITORING APPLICATIONS

CN.NC.SV.24_32
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Abstract

Effective environmental monitoring in complex spaces requires mobile, flexible data collection solutions with basic autonomous capabilities. This study presents the design, implementation, and evaluation of an omnidirectional 4-wheel Mecanum robot system, serving as an integrated IoT environmental monitoring platform. The robot is equipped with DHT11 (temperature, humidity) and MQ-2 (air quality/gas) sensors. The unique omnidirectional movement capability of the Mecanum wheels allows the robot to navigate effectively, complemented by an automatic obstacle avoidance system using a single servo- mounted ultrasonic sensor to scan the environment in primary directions (left, straight, right). Another notable feature is the integration of two parallel wireless control methods: Bluetooth provides detailed control and data transmission capabilities, while Infrared (IR) offers a simple control option. A Feedforward control technique is applied via simulation to enhance trajectory accuracy. A user interface, built using MIT App Inventor, allows for robot control and real-time monitoring of environmental data. The system combines the flexibility of omnidirectional movement, multi-parameter sensing, basic autonomous capabilities, dual wireless control, and an intuitive IoT interface, providing a comprehensive, flexible, and accessible solution for mobile environmental monitoring.

Keywords: Mecanum Robot, Environmental Monitoring, IoT, Mobile Robot, Automatic Obstacle Avoidance, Ultrasonic Sensor, DHT11, MQ-2, Bluetooth, Infrared, MIT App Inventor, Feedforward Control.

DEVELOPING AN INTELLIGENT WAREHOUSE SYSTEM FOR MOLD MANAGEMENT AND UTILIZATION IN THE MOLD MANUFACTURING INDUSTRY

CN.NC.SV.24_34
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Advisor: Assoc. Prof. Dr. Nguyen Nhu Tung

Abstract

Currently, there are some manufacturing industries that are developing really strong such as plastics, automobiles, packaging, electronics, etc. industries. In which molds play an important role in ensuring the production of high-quality products. However, mold management warehouses in Vietnam still have many limitations in applying modern techniques and machinery, reducing productivity. Therefore, this study focuses on developing an intelligent warehouse for the mold management industry. The warehouse system will utilize technologies such as artificial intelligence (AI) to monitor wear and tear, classify mold storage locations, and optimize mold loading time. This will increase factory productivity and reduce operating costs. Machinery and equipment serving the mold industry are all imported from developed countries such as the US, Korea, China, etc. Therefore, issues related to constructing a smart warehouse system for mold management have not been mentioned much. Therefore, the development of a smart warehouse for the mold management industry in Vietnam is extremely necessary.

Keywords: Intelligent Warehouse System, Mold Management and Maintenance, Mold Manufacturing Industry.

OPTIMIZATION OF THE LESS THAN CONTAINER LOAD (LCL) CONSOLIDATION OPERATIONS IN SEA FREIGHT LOGISTICS

CN.NC.SV.24_35

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Advisor: Assoc. Prof. Dr. Nguyen Nhu Tung

Abstract

This study focuses on optimizing the Less-than-Container Load (LCL) consolidation process in maritime transport within Vietnam's logistics industry. As demand for shipping increases, many businesses need to ship smaller volumes of goods, leading to a growing interest in LCL services. However, LCL consolidation faces challenges such as long waiting times, inventory costs, and complex coordination. This research aims to enhance the LCL process by exploring strategies to maximize container space utilization, reduce waiting times, and minimize costs, while improving service quality and flexibility to meet customer demands. The study evaluates the current LCL consolidation processes at major seaports in Vietnam, including Hai Phong, Cat Lai, and Da Nang, identifying bottlenecks and inefficiencies. It also investigates the role of modern technologies such as Warehouse Management Systems (WMS), Transportation Management Systems (TMS), and artificial intelligence (AI) in improving the efficiency of consolidation activities. The research employs a combination of theoretical methods and surveys to collect data from maritime transport enterprises, analyzing the needs for technological integration and process optimization. The findings suggest that the integration of automated systems and AI-driven tools can significantly improve LCL consolidation efficiency by reducing delays, enhancing inventory management, and optimizing container space. Ultimately, this research provides valuable insights into enhancing the efficiency and effectiveness of LCL operations, offering a roadmap for improving Vietnam's maritime logistics services. Keywords: LCL consolidation, maritime logistics, container optimization, Vietnam, AI, Warehouse Management System, Transportation Management System, logistics efficiency.

Keywords: LCL consolidation, maritime logistics, container optimization, Vietnam, AI, Warehouse Management System, Transportation Management System, logistics efficiency.

APPLICATION OF GREEN LOGISTICS AND REVERSE SUPPLY CHAIN IN THE CONSUMER ELECTRONICS INDUSTRY IN VIETNAM

CN.NC.SV.24_36
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Advisor: Assoc. Prof. Dr. Nguyen Nhu Tung

Abstract

The rapid growth of the electronics industry, coupled with the increasing consumption of consumer electronic devices, has led to a sharp rise in the generation of electronic waste (e-waste). This growing amount of e-waste not only raises serious environmental concerns but also results in inefficient resource utilization and potential loss of valuable materials. In Vietnam, the current practices related to the collection, treatment, and recycling of e-waste are still fragmented and largely uncoordinated. Furthermore, the adoption of advanced technological solutions and systematic models for managing e-waste remains limited, which significantly hinders the country's progress toward sustainable development in the electronics sector. In this study, the research team employed a combination of qualitative and quantitative research methods to conduct field investigations, assess the current state of e- waste collection and processing, and identify key factors influencing stakeholder behavior in e-waste management. Based on the findings, the study proposes a structured e-waste collection model that integrates three fundamental flows: financial flow, material flow, and information flow. This model aims to optimize the entire cycle of e-waste collection, treatment, and recycling by ensuring a smooth and efficient transfer of resources, incentives, and information across all stakeholders. The research is expected to provide valuable insights and practical recommendations for businesses and policymakers in their efforts to promote green logistics and reverse supply chain applications. These solutions not only support environmental protection but also improve the economic efficiency of resource circulation in the context of Vietnam's growing consumer electronics industry.

Keywords: Reverse Logistics, e-waste, Green Logistics, Reverse Supply Chain, Electronics Industry

BUILDING AN AI-BASED MONITORING SYSTEM FOR CASH REGISTER COUNTERS

CN.NC.SV.24_37
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Advisor: Dr. Kim Dinh Thai

Abstract

"The evolution of retail technologies increasingly emphasizes automation, accuracy, and user convenience, especially in product recognition and billing. Traditional barcode and RFID systems, though common, face challenges in scalability and speed. This study proposes a smart vision-based system that leverages YOLOv12, an advanced deep learning model, to automate product detection and streamline billing in real-time. Using a high-resolution camera and YOLOv12's robust object detection capabilities, the system identifies retail items under various conditions such as occlusion and lighting changes. It supports edge deployment with optimized performance through hardware acceleration and model quantization. Key features include automatic cart updates, real-time product counting, customer tracking, wait time monitoring, and automatic invoice generation. A chatbot is also integrated for enhanced customer interaction. The system is designed to work with existing POS platforms, enabling seamless integration. This research demonstrates the potential of YOLOv12-powered solutions to improve speed, accuracy, and user experience in modern, cashier-less retail environments.

Keywords: Smart retail system, YOLOv12, Automated billing

A BREAKTHROUGH AND MOBILE METAL 3D PRINTING ROBOT FOR THE FUTURE OF MANUFACTURING AND EDUCATION

CN.NC.SV.24_38

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Advisors: Dr. Nguyen Van Anh, Dr. Le Xuan Hai

Abstract

This research report presents the design and development of an autonomous metal 3D printer featuring a novel printing nozzle capable of fabricating structures at milli- to micro-scale precision. The study comprehensively analyzes the key features, advantages, and limitations associated with constructing a small-scale metal 3D printer. The paper proposes an alternative approach to control and analyze the system by implementing a reverse kinematic model. The system's performance is validated through extensive MATLAB/Simulink simulations. Additionally, experimental evaluations on a physical prototype confirm the accuracy and reliability of the proposed approach.

Keywords: 3D Printer, Metal Additive Manufacturing, Micro-scale Fabrication, Reverse Kinematics, MATLAB/Simulink Simulation, Dynamic Model

OPTIMIZATION MODEL FOR ENHANCING EFFICIENCY IN VIETNAM'S DOMESTIC REEFER LOGISTICS MARKET: A STRATEGIC APPROACH TO STRENGTHENING SUPPLY CHAIN COMPETITIVENESS

CN.NC.SV.24_42
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Abstract

Vietnam's cold chain logistics system plays a crucial role in preserving the quality and safety of perishable products such as fresh produce, seafood, and pharmaceuticals. However, inefficiencies such as fragmented storage, underutilized vehicles, and poor route planning continue to drive up operational costs and product spoilage rates. This study addresses these challenges by proposing a multi-layered optimization model specifically designed to improve the efficiency of domestic reefer logistics, using WinMart's supply chain in Hanoi as a real-world case study. The model is formulated as a Mixed-Integer Quadratic Programming (MIQP) problem, incorporating key logistical elements such as vehicle routing, cold storage selection, delivery timing, and perishability loss. Parameters such as truck leasing cost, fuel consumption, toll charges, refrigeration capacity, delivery time windows, and product value degradation are integrated into a unified cost function. The model also introduces constraints reflecting real-world limitations in transportation capacity, warehouse load, and cold chain preservation. Simulation results show that the optimal solution requires only one farm (Vĩnh Phúc), one cold storage facility (Trung Văn), and five refrigerated trucks — each assigned to a unique delivery route. This configuration minimized the total cost to 257,380,010 VND, while achieving 100% on-time delivery with no cold chain violations or excess inventory. Notably, fixed leasing and cold storage costs accounted for more than 85% of total expenditure, highlighting key areas for strategic cost control. This study contributes to both academic research and practical logistics management by demonstrating how centralized sourcing, intelligent resource allocation, and infrastructure- aware planning can drastically enhance cold chain performance. The findings have significant implications for developing sustainable, scalable logistics systems in Vietnam and similar emerging markets.

Keywords: Cold Supply Chain Optimization, Urban Logistics, Cold Storage Cost Minimization, Refrigerated Transport

SMART CAR PARKING: REAL-TIME INFORMATION & NAVIGATION

CN.NC.SV.24_43

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Advisor: Dr. Kim Dinh Thai

Abstract

This study rigorously assesses the effectiveness of cutting-edge YOLO (v9-v11) for real-time object detection and subsequent DeepSORT tracking in a custom ANPR system for Vietnamese parking management. The framework seamlessly integrates character recognition, benchmark- ing TrOCR against Tesseract for OCR. Identified plates trigger automated vehicle entry/exit and 6 7 real-time fee calculation. Furthermore, utilizing the tracked vehicle data, the research investi- gates A*'s applicability for optimized route planning within parking premises. Empirical val- idation on our Vietnamese dataset reveals YOLOv11n achieving 99.39% mAP@50 in license plate detection, YOLOv11n-OBB in parking status with 90.46% mAP@50, TrOCR demon- strating enhanced OCR accuracy with 2.71% character error rate, and A* providing efficacious navigational assistance. This research contributes to high-performance parking management, combining advanced ANPR with automated real-time transactions and intelligent guidance.

Keywords: YOLO, DeepSORT, ANPR system, Vietnamese parking management, TrOCR, real-time fee calculation, A*, route planning, intelligent guidance.

BUILDING AN AUTOMATED PICKLEBALL MATCH ANALYSIS SYSTEM USING MACHINE LEARNING AND COMPUTER VISION

CN.NC.SV.24_44

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Abstract

In recent years, pickleball has rapidly gained popularity worldwide due to its accessibility and dynamic gameplay, prompting an increasing demand for advanced performance analysis tools. This study proposes a comprehensive, automated system for analyzing pickleball matches using state-of-the-art machine learning and computer vision techniques. By leveraging deep learning models—particularly YOLO11 for real-time object detection and keypoint estimation—the system is capable of accurately identifying players, tracking ball movement, and extracting critical match events such as scoring, serves, and rallies. The research integrates multi-source data, including high-resolution match videos and sensor-based motion data, to construct a robust pipeline encompassing object detection, tracking, performance metrics calculation, and visual analytics through heatmaps and pose estimation. The model was trained and tested on annotated pickleball datasets and evaluated using industry-standard metrics such as precision, recall, mAP, and IoU, with results indicating high accuracy and strong generalization ability in real-time match scenarios. Furthermore, the system incorporates a large language model (LLM) deployed via the Groq platform to interpret performance data and generate personalized training recommendations. This hybrid approach not only supports coaches and athletes in evaluating technical skills and tactical decisions but also represents a scalable solution for future applications in broader sports analytics domains.

Keywords: Pickleball, Sports Analytics, YOLO11, Deep Learning, Object Detection, Pose Estimation, Machine Learning, Computer Vision, Real-time Tracking, Performance Evaluation

LUNG CANCER DETECTION BY USING CT IMAGES

CN.NC.SV.24_45

Students:

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Dang Phuong Nam	ICE2022A	22071076

Advisor: Dr. Pham Thi Viet Huong

Abstract

Lung cancer is a serious global health problem, one of the leading threats, but is often detected late, when treatments are least effective, leading to high mortality rates. Moreover, manual diagnosis of lung cancer is often time-consuming and ineffective due to its dependence on the doctor's observation, expertise, and experience. In particular, the increasing number of patients can overload doctors, leading to inaccurate diagnosis results. So, the use of AI to support diagnosis has been researched and increasingly developed. As Benoît Audelan of the Epione project team at the French National Institute of Digital Sciences and Technology (Inrea) at the University of Côte d'Azur, published at the International Congress of the European Respiratory Society, Audelan collaborated with others on CT images of 888 patients with suspicious tumor growths screened by radiologists, then tested the AI program on a group of 1,179 patients participating in a lung cancer screening trial and obtained results of a diagnosis rate of up to 97%[1]. Therefore, in this study, we used the AI program combining a two-stream network architecture with the advantages of Convolutional Neural Networks (CNN) to create a new method to improve the efficiency of lung cancer diagnosis. In the first stream, we process the images of the original data, while in the second stream, the images are transformed from the spatial domain to the frequency domain using the discrete Fourier transform (DFT), and then through a high-pass filter to limit the low-frequency components. To implement the above method, we used two datasets: the IQ-QTH/NCCD image dataset and the chest CT-scan dataset and classify the disease into five categories. Our method promises to be a useful tool with an accuracy of up to 98.84%.

Keywords: Convolutional Neural Network (CNN), Two-stream network architecture, Discrete Fourier Transform, High Pass Filter

WEATHER REGCORGNITION USING NEURAL NETWORK

CN.NC.SV.24_46
Students:

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Advisor: MSc. Do Tien Thanh

Abstract

As extreme weather events become more common and unpredictable, especially in vulnerable regions like Vietnam, there's a growing need for faster, more accessible ways to monitor weather conditions. Traditional forecasting tools—like satellites and sensors—can be costly and difficult to maintain, particularly in rural or under-resourced areas. This research explores how deep learning, specifically Convolutional Neural Networks (CNNs), can help classify weather conditions based on images. We created a custom dataset of 1,976 images, each labeled as cloudy, rain, shine, sunrise, or fog/smog, and applied data augmentation to make the model more adaptable to real-world conditions. Our approach involved testing different neural network architectures, including a standard CNN, ResNet, and Inception, and using techniques like dropout to prevent overfitting and Softmax to interpret the results as probabilities. To evaluate the model's performance fairly, we used K-Fold Cross Validation. The results show that deep learning models can accurately recognize weather patterns from images, offering a low-cost and practical solution for real-time weather monitoring in areas where traditional systems may not be available.

Keywords: Classification, CNN, deep learning, ResNet, K-fold

DRIVER FACIAL EXPRESSION ANALYSIS USING ARTIFICIAL INTELLIGENCE FOR ENHANCED ROAD SAFETY

CN.NC.SV.24_05

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Advisor: Dr. Kim Dinh Thai

Abstract

Drowsy driving is a major contributor to road accidents, often resulting in severe injuries and fatalities. In response to this issue, this study proposes a driver monitoring system that leverages artificial intelligence, specifically object detection techniques, to identify early signs of driver fatigue. By utilizing the YOLOv8 model, the system detects key facial features such as eye closure, yawning, and head tilting—common indicators of drowsiness. Once these features are recognized, the system generates real-time alerts to help prevent potential accidents caused by reduced driver awareness. The model was trained and tested on a curated dataset of driver facial expressions under various conditions, including low lighting, different camera angles, and partial facial occlusion. Preliminary results show that the system can effectively detect signs of drowsiness with high accuracy, offering a promising solution for real-world deployment in vehicles. This research demonstrates how modern deep learning techniques can be adapted for road safety applications, emphasizing the importance of real-time monitoring and proactive inter- vention to reduce risks associated with driver fatigue.

Keywords: driver monitoring, drowsiness detection, computer vision, YOLOv8, object detection, real-time alert system

FACTORS IMPACTING FIRM VALUE: EVIDENCE FROM S&P 1200 COMPANIES – 01

TC.NC.SV.24_01

Students:

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Advisor: Dr. Nguyen Thi Kim Oanh

Abstract

This study investigates the effects of CSR sustainability external audits and ESG performance on firm value using a panel dataset of 293 non-financial firms indexed in the S&P 1200 over the period 2014–2023, resulting in 2,930 firm-year observations. Data were sourced from Refinitiv, with banks and financial institutions excluded. The analysis employs fixed-effects regression models to control for industry and year-specific heterogeneity. The empirical results reveal that both CSR sustainability external audits exhibit a negative relationship with firm value and and ESG performance has a negative effect or no effect with firm value, suggesting that such initiatives may be perceived by investors as cost-intensive or inefficient, thereby failing to enhance short-term market valuation. Conversely, return on assets (ROA) and firm market capitalization positively influence firm value, underscoring the importance of profitability and investor confidence. On the other hand, higher cost of capital (WACC) and firm size are negatively associated with firm value, potentially reflecting inefficiencies and risk perceptions. These findings contribute to the ongoing debate on the financial implications of corporate sustainability practices and call for a more nuanced understanding of how CSR assurance and ESG initiatives are perceived in capital markets.

Keywords: Firm values, CSR sustainability external audit, ESG performance, ESG score, The S&P1200

EFFECTS OF FINANCIAL STATEMENT COMPARABILITY ON STOCK LIQUIDITY: A CASE OF VIETNAM

TC.NC.SV.24_02

Students:

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Bui Thu Hang	BDA2022C	0397182617

Advisor: MA. Nguyen Hoang Lan

Abstract

This study investigates the relationship between financial statement comparability and stock liquidity in the context of the Vietnamese stock market, which is characterized by a high level of state ownership. Using panel data from 105 non-financial Vietnamese listed firms between 2010 and 2023, the analysis explores the effect of financial statement comparability on two key liquidity measures: stock turnover ratio (STO) and the Amihud (2002) illiquidity ratio (ILLIQ). The findings reveal that financial statement comparability positively affects stock liquidity when measured by the stock turnover ratio, particularly among non-state-owned enterprises (NSOEs). However, this effect is not statistically significant when using the Amihud illiquidity measure or within the group of state-owned enterprises (SOEs). These results underscore the importance of financial transparency and suggest that enhancing financial statement comparability can reduce information asymmetry, bolster investor confidence, and ultimately improve market liquidity and efficiency in transitional economies such as Vietnam.

Keywords: Financial statement comparability, Stock liquidity, State- owned enterprises (SOEs), Information environment

THE INFLUENCE OF ECONOMIC INDICATORS ON THE BALANCE OF PAYMENTS AMIDST EMERGING ECONOMIC VOLATILITY IN VIETNAM

TC.NC.SV.24_03

Students:

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Advisor: MA. Duong My Hanh

Abstract

This study investigates the impact of key macroeconomic factors on Vietnam's Balance of Payments (BoP) during the period from 2008 to 2023. Driven by Vietnam's increasing economic integration into the global economy and the challenges posed by external shocks such as the COVID-19 pandemic, this study aims to determine the extent to which interest rates, the trade balance, foreign direct investment (FDI), and the consumer price index (CPI) affect the fluctuations of the balance of payments (BoP). Secondary data were collected quarterly from the International Monetary Fund and the General Statistics Office of Vietnam. Many estimation tools and techniques were used, followed by running regression models using STATA software to confirm the model's fit and review the model's results. The findings show that the model is statistically significant ($F = 8.51$; $p < 0.01$) but has limited explanatory power ($R^2 = 0.3739$). Among the four independent variables, only the trade balance (BOT) has a positive and statistically significant impact on the BoP (coefficient = 0.66391; $p = 0.001$), while interest rates, FDI, and CPI do not show significant effects during the study period. This result highlights the important role of trade efficiency in improving the balance of payments and suggests that policies should focus on promoting exports, controlling imports, and stabilizing the trade environment to ensure macroeconomic stability and sustainable growth.

Key words: Balance of Payment (BOP), Balance of Trade (BOT), FDI, CPI, Interest Rates

THE INFLUENCE OF FEMALE CEOS ON CORPORATE GOVERNANCE, CAPITAL STRUCTURE, AND PERFORMANCE OF LISTED FIRMS IN VIET NAM

TC.NC.SV.24_05

Students:

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Advisor: Dr. Le Thi Thu Huong, MA. Phan Bao Trung, Dr. Do Bao Linh

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Abstract

This study investigates the impact of female chief executive officers (CEOs) on corporate governance, capital structure, and firm performance within the unique context of Vietnam's rapidly evolving economy. Drawing upon Upper Echelons Theory, which posits that executive characteristics influence organizational outcomes, this research examines how female leadership shapes corporate decision-making in a traditionally patriarchal business environment. While prior global studies suggest that female-led firms exhibit lower risk-taking, stronger governance compliance, and potentially enhanced performance, a significant gap exists in understanding these dynamics within Vietnam's specific cultural, economic, and regulatory landscape. Utilizing panel data from 86 of Vietnam's top-listed enterprises (Vietstock dataset, 2020-2024), this study analyzes the relationship between female CEO presence and key indicators of firm performance (Return on Equity, liquidity), corporate governance, and capital structure (debt-to-equity ratio). The findings reveal that female CEOs in Vietnam exert a positive influence on firm performance, specifically enhancing Return on Equity and improving liquidity, while adopting more conservative capital structures. This research contributes novel empirical evidence on female leadership in an underexplored emerging market, highlighting its potential to drive both profitability and financial stability. The implications of these findings are significant for policymakers seeking to promote gender diversity and for businesses aiming to leverage female leadership as a strategic asset in Vietnam's competitive market.

Keywords: FEMALE CEO, CORPORATE GOVERNANCE, CAPITA STRUCTURE, FIRM PERFORMANCE, VIETNAM, GENDER DIVERSITY, EXECUTIVE LEADERSHIP, EMERGING MARKET.

THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY (CSR) ON THE COST OF CAPITAL: AN ANALYSIS OF VIETNAMESE LISTED FIRMS

TC.NC.SV.24_12
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Advisor: Dr. Le Thi Thu Huong, MSc. Nguyen Hoang Lan

Abstract

Corporate Social Responsibility and the cost of capital have been thoroughly examined in developed markets, but have yet to be contextualized within emerging economies, namely Vietnam, where market characteristics and corporate culture may lead to different outcomes. This study aims to fill the gap by assessing how CSR activities impact both the cost of equity (COE) and cost of debt (COD) for firms in the Vietnamese market using the sample of 130 listed firms on Ho Chi Minh Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) from 2010 to 2023. Panel data regression models, with the Fixed Effects Model (FEM) as the primary estimation method, are employed for analysis. We find that the cost of equity exhibits a statistically significant positive relationship with CSR performance. This implies that strong performance in environmental, social, and governance (ESG) factors enables firms to access capital at lower costs and under more favorable financial conditions. The significant positive relationship between CSR and both COE and COD suggests that Vietnamese firms engaging in CSR initiatives may experience higher financial costs. We discover that the cost of equity and cost of debt have a positive correlation with CSR performance when utilizing two CSR measures, which serves to strengthen this relationship. This suggests that, after accounting for firm-level characteristics, firms with higher CSR performance may face higher costs of equity financing. Furthermore, firms that disclose CSR information may be perceived as taking on greater risk by creditors, potentially due to 2 skepticism about the costs involved or the veracity of such disclosures. As a result, both equity investors and debt providers may demand higher returns, contributing to an overall increase in a firm's cost of capital.

Keywords: CSR, Cost of Capital, Viet Nam, ESG.

THE INFLUENCE OF BEHAVIORAL FACTORS ON THE FINANCIAL AND INVESTMENT INTENTION OF GENZ

TC.NC.SV.24_07

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Advisors: Dr. Le Thi Thu Huong, MSc. Nguyen Tuan Minh

Abstract

This paper aims to examine the effect of behavioral psychological factors (overconfident bias, representative bias, regret aversion, mental accounting, and herd behavior) on investment intention of GenZ in Vietnam. Methodology For this purpose, from November 2024 to February 2025, collected data on 206 subjects from Vietnam who have the intention to invest. This study posits behavior variables from the Theory of Planned Behavior (TPB) with various demographic characteristics. This study utilized a structured online questionnaire survey to and by PLS-SEM, CFA, and EFA was performed. Findings The findings from this study revealed that not all behavioral psychological factors from TPB were significant on Gen Z toward investment intention; just representative bias and mental accounting had a significant effect. These findings were contrary to prior literature. Originality This study sheds light on the complexity of investment decision-making among Gen Z investors in Vietnam. It emphasizes the distinctive influence of representative bias and mental accounting, while questioning the broader applicability of other behavioral psychological factors traditionally assumed to be significant. By applying the Theory of Planned Behavior in a developing market context, the study expands the theoretical boundaries of behavioral finance and provides empirical evidence from a rapidly growing investor demographic.

Keywords: Behavioral finance, investment intention, GenZ, Vietnam, Theory of Planned Behavior

THE RELATIONSHIP BETWEEN RISK AVERSION AND RISKY INVESTMENT INTENTION: THE INFLUENCE OF BIG FIVE PERSONALITY CHARACTERISTICS AND THE MODERATING ROLE OF AI IN INVESTMENT INTENTION

KT.NC.SV.24_23
Students:

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Advisor: Dr. Do Phuong Huyen

Abstract

This study focuses on exploring the relationship between risk aversion and risky investment intention, examining the influence of Big Five personality traits and the moderation of artificial intelligence (AI) on this relationship. Data were collected by surveying personality, risk aversion, risky investment intention, and attitude toward investment advice from artificial intelligence (AI) from 240 participants. The analysis results showed that three personality traits (Agreeableness, Extraversion, Neuroticism) were determined as predictors of risk aversion. Regarding artificial intelligence, although the variables Behavioral intention to accept AI-based recommendation and Perceived accuracy of AI have an impact on risky investment intention, they do not have a moderating role in the relationship between Risk aversion and risky investment intention. This study provides insights into how individual personality differences and interactions with AI technology shape risky investment behavior in the current digital age.

Keywords: Risk aversion, risky investment intention, big five personality traits, artificial intelligence

HOW DO DIVIDEND PAYMENTS AFFECT CORPORATE'S FINANCIAL PERFORMANCE: A VIETNAMESE MARKET PERSPECTIVE

KT.NC.SV.24_35
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Hoang Khanh Ha	AC2022A	22070898
Hoang Thi Thu Ngan	IB2022A	22070555
Nguyen Quynh Ngan	IB2022B	22070558

Advisor: Dr. Do Phuong Huyen

Abstract

As the Vietnamese stock market continues to expand and attract more investors, dividend payment is becoming an important component of the financial strategies of publicly listed companies. This research delves into understanding how do dividend payments affect corporate's financial performance through A Vietnamese market perspective. The paper collected data of 835 firms that are listed on the stock market of Vietnam from 2018 to 2024. The paper constructs a research model in which Return on Assets (ROA), Return on Equity (ROE), and corporate value (Tobin's Q) serve as dependent variables, while cash dividend payout ratio (DCASH) is considered as an independent variable. The decision to pay cash dividends (DCASH) was found to have a negative impact on ROA and ROE. High dividend payouts may reduce profitability by reducing reinvestment. For Tobin's Q, DCASH appears to be statistically insignificant. Furthermore, total asset turnover (TAT) and sales growth (GROWTH) have a positive and significant impact on ROA and ROE, indicating that operational efficiency and sales expansion are important drivers of financial performance. Financial leverage (LEV) has a strong and significant negative impact on both ROA, ROE and Tobin's Q. This research also recommends developing a more tailored dividend strategy, lowering the dividend rate, and making dividend payment decisions more transparent and well-communicated.

Keywords: dividend rate; cash dividend payout; financial performance; Vietnam market.

THE IMPACT OF FINANCIAL LITERACY, MATERIALISM, AND LOCUS OF CONTROL ON RISKY BNPL INTENTION AND BEHAVIOR: A STUDY AMONG VIETNAMESE COLLEGE STUDENTS

KT.NC.SV.24_09

Students:

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Nguyen Tuan Anh	IB2022A	22070455
Nguyen Tran Thuy Ngan	IB2022C	22070540
Dang Le Thu Trang	IB2022D	22070552
Nguyen Bich Ngoc	IB2023D	23071067

Advisor: Dr. Do Phuong Huyen

Abstract

This research explores the factors influencing the risky Buy Now, Pay Later (BNPL) intentions and behaviors of young consumers, specifically university students, in the context of Vietnam's digital credit landscape. Leveraging the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), Theory of The Family Resource Management (FRM) and financial literacy frameworks as the conceptual foundation, the study investigates key determinants such as subjective financial literacy, objective financial literacy, financial self-efficacy, materialism, and locus of control, and their effects on risky BNPL intentions and subsequent behavior addition to providing useful implications for educators, legislators, and financial service providers to address the interaction of psychological traits, teenage credit consumption, and financial literacy, these findings advance our understanding of how young consumers make financial decisions in developing countries.

Keywords: Financial literacy, Risky BNPL intention, Materialism, Locus of control, College Students

STUDENT RESEARCH REPORT FACTORS AFFECTING THE LIQUIDITY OF THE COVERED WARRANT, EVIDENCE FROM VIETNAM STOCK MARKET

KT.NC.SV.24_58
Students:

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Cao Do Thuy Tien	AC2022B	22071069

Advisor: Dr. Do Phuong Huyen

Abstract

In Vietnam, as the digital economy and financial market are developing rapidly, businesses and investors are expected to keep up with new trends. Therefore, this research proposal aims to assess the impact of stock price volatility, underlying asset trading volume, and macroeconomic factors on the liquidity of covered options in the Vietnamese stock market. Specifically, the study will explore the complex relationships between investors' trading behavior and factors such as underlying asset volatility, general market movements, moneyness flexibility, and the trading time of covered options. To do this, the study will apply the linear regression method (OLS) along with statistical analysis tools through Stata software. Data will be carefully collected from sources such as FiinPro, Vietstock, and Investing.com, with a total of 1,105 observations, to ensure accuracy and multidimensionality for the analysis. Finally, the study expects to shed light on the significant impacts of market volatility, moneyness, underlying trading volume, risk-free rate, and trading period on the liquidity performance of covered options, thereby providing useful strategic recommendations for investors, issuers, and regulators in the context of the constantly changing financial market.

Keywords: Covered warrants, Liquidity, Stock volatility, Trading volume, Risk-free rate, Moneyness, Market volatility

EXPLORING THE DETERMINANTS OF FINTECH ADOPTION: EVIDENCE IN VIETNAM

TC.NC.SV.24_06

Students:

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Cao Minh Duong	AC2022C	22070931
Dang Khuong Linh	AC2022B	22070943
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Advisor: Dr. Do Phuong Huyen

Abstract

This study aims to investigate the key factors influencing fintech adoption, focus on the relationships between behavioral intention, use behavior and the key factors of TAM and UTAUT model. Using a sample of Vietnamese users, the study applies the Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach to model the direct and indirect effects of these factors on fintech adoption. Descriptive statistics were first analyzed to understand the distribution of key variables. Hypothesis testing revealed that performance expectancy and attitude significantly influence behavioral intention, while behavioral intention and performance expectancy are strong predictors of actual usage behavior. Interestingly, factors such as facilitating conditions, social influence, and government support were found to have limited effects on adoption in the Vietnamese context. The findings highlight the critical role of perceived value and individual attitudes in driving fintech adoption, offering valuable insights for fintech providers, policymakers, and future researchers seeking to understand and foster digital financial services in emerging markets.

Keywords: Fintech Adoption, Fintech, UTAUT, TAM, Vietnam.

ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) FACTORS ON INVESTORS' PERCEPTIONS OF MARKET VALUATION IN FTSE 350 FIRMS

KT.NC.SV.24_07
Students:

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Advisor: MA. Duong My Hanh

Abstract

This study investigates the impact of Environmental, Social, and Governance (ESG) factors on investors' perceptions of market valuation among FTSE 350 firms. The study utilizes secondary data collected from companies listed in the FTSE 350 Index over the period 2018–2022, sourced from Bloomberg. Using multiple linear regression analysis on STATA, the research evaluates the relationship between ESG indicators and key market valuation metrics including market value, Tobin's Q, and earnings per share (EPS). The findings reveal that while the overall ESG score does not significantly influence market value (β = -43.3839; p-value > 0.05) or EPS (β = 0.2004; p-value = 0.2970), it is positively associated with Tobin's Q (β = 0.0973; p-value = 0.0485), suggesting that investors tend to assign higher valuation multiples to firms with stronger ESG practices. Notably, ESG subcomponents—Environmental (β = 0.0335; p- value = 0.0386), Social Responsibility (β = 0.0007; p-value = 0.0012), and Corporate Governance (β = 0.0008; p-value = 0.0009)—exhibit statistically significant positive effects on Tobin's Q, indicating that these dimensions contribute to investor optimism about future growth. The study contributes to sustainability literature by offering empirical evidence on how ESG dimensions affect perceived corporate value, highlighting their role in shaping investor expectations in the UK capital market.

Key words: ESG factors, market valuation, investors' perception, EPS, Tobin's Q, UK.

THE EFFECT OF DIGITAL INFLUENCE ON THE RISE OF SCAMS IN VIETNAM'S STUDENT COMMUNITY: CASE STUDY FROM MR.PIPS

KT.NC.SV.24_56

Students:

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Duong Dinh Hoang	IB2022C	22070440
Tran Hong Phuc	IB2022C	22070368
Nguyen Thi Thu Tra	IB2022C	22070564
Bui Huyen Trang	IB2022A	22070583

Advisor: MA. Dang Ngoc Quang

Abstract

This study investigates the impact of digital influencers, particularly Key Opinion Leaders (KOLs) on social media platforms such as TikTok and Facebook, in amplifying the prevalence of scams among students in Vietnam. The research focuses on how exposure to digital media and the influence of KOLs shape students' financial perceptions, behaviors, and vulnerability to fraud, specifically job and investment scams. Through a survey of Vietnamese university students, the study examines psychological and behavioral responses to financial content shared by influencers and aims to uncover the factors contributing to students' susceptibility to scams. By analyzing data from 221 students in the Investment Scam group and 215 students in the Job Scam group, the study reveals that social media engagement, particularly attention to short-form videos and following KOLs, significantly affects students' willingness to apply for jobs, invest, and pay for job applications. The findings provide valuable insights into the mechanisms that facilitate the spread of scams in the digital age and highlight the need for targeted interventions to mitigate risks, with a focus on enhancing digital literacy and financial education among students in Vietnam's rapidly evolving digital landscape.

Keywords: Digital influencers, Scams, Students, Investment scams, Job scams.

THE IMPACT OF ESG FACTORS ON FIRM PERFORMANCE: EVIDENCE IN THE EU AND THE US FIRMS

KT.NC.SV.24_20
Students:

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Hoang Minh Thuy	IB2022C	22070586
Dang My Ngoc	IB2022B	22070529

Advisor: MSc. Dang Ngoc Quang

Abstract

In the context of growing environmental concerns, this study examines the impact of ESG score on firm outcomes in high-emission industries across the EU and the US. Using data from Refinitiv Eikon Datastream covering 174 EU firms and 67 US firms, and applying fixed effects regression analysis in R, the study investigates the effects of ESG Score and Environmental Pillar Score on ROA, ROE, and Tobin's Q The results show that the ESG Score has a statistically significant positive impact on ROA in European firms. No significant relationship was found between ESG or Environmental Pillar Scores and ROE or Tobin's Q in either region. However, the Environmental Pillar Score shows a partially effect on Tobin's Q in the EU. These findings highlight the influence of regional regulatory contexts on ESG effectiveness and provide practical insights for firms, investors, and policymakers aiming to strengthen sustainable business practices in carbon-intensive sectors.

Keywords: ESG Score, firm performance, High – CO2 emission industry, environment pillar score

ANNUAL REPORT READABILITY AND DEBT CHOICE: THE CASE FROM VIETNAM

TC.NC.SV.24_10

Student:
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Advisor: Dr. Le Thi Thu Huong

Abstract

This research examines the influence of annual report readability on corporate debt choice, focusing on a sample of Vietnam's 200 largest publicly listed firms from 2015 to 2023. Drawing upon agency theory, signaling theory, and information asymmetry theory, the study explores whether firms with more transparent and comprehensible financial disclosures are more likely to secure bank loans, whereas those with lower readability face greater information asymmetry and thus depend more on public debt. Readability is assessed using the Gunning Fog Index, Flesch-Kincaid Score as well as File Size, while debt composition is analyzed through bank debt ratios and public debt ratios. Utilizing panel data regressions with firm and year fixed effects, alongside Generalized Method of Moments (GMM) estimation to address endogeneity concerns, the findings indicate that firms with lower readability levels in annual reports exhibit a significantly greater reliance on bank debt, whereas those with higher readability tend to favor public debt. Furthermore, firm size moderates this relationship, with smaller firms being more reliant on readability to secure financing, while larger firms leverage alternative credibility signals such as credit history and market reputation.

Keywords: Annual report readability, debt choice, bank debt, public debt, firm size, financial disclosure, emerging markets, Vietnam.

FACTORS AFFECTING THE CAPITAL STRUCTURE OF LISTED LOGISTICS ENTERPRISES IN VIETNAM

TC.NC.SV.24_11

Students:

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Do Minh An	IB2022A	22070482

Advisor: Assoc. Prof. Dr. Nguyen Van Dinh

Abstract

This study explores the determinants of capital structure within logistics enterprises listed on the Vietnamese stock market from 2014 to 2023. By examining factors such as profitability, growth opportunity, firm size, tangible assets, liquidity, and firm age, the research utilizes a linear regression model to identify their correlation with the debt ratio. The results indicate that profitability, tangible assets, and firm size positively influence debt ratios, while liquidity and 7 firm age exhibit a negative correlation. The findings highlight the strategic importance of balancing debt and equity to optimize financial performance and growth potential. Practical implications are provided for logistics enterprises in improving capital structure decisions and managing financial risks. Policymakers and investors are encouraged to focus on enhancing financial accessibility, supporting infrastructure development, and promoting transparency within the logistics sector to foster sustainable growth. Limitations such as the study's scope and timeframe are addressed, paving the way for future research to incorporate broader variables and extended periods of analysis. 6.

Keywords: Capital structure, Logistics enterprises, Listed companies, Vietnam, Determinants, Regression model

BENCHMARKING CORPORATE FINANCIAL PERFORMANCE: THE FOOD AND DRINK SECTOR IN VIETNAM

KT.NC.SV.24_29
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Le Minh Thu	AC2023A	23071138
Cao Hieu Khanh	BDA2022C	22070623

Advisor: Dr. Nguyen Phu Hung

Abstract

This study evaluates the financial performance of Vietnam's Food and Drink (F&D) sector (2014–2024), analyzing over 200 listed companies across four industries: Food and Drink, Energy, Household Durables, and Healthcare. Using data from Vietstock.vn, the research applies regression analysis, statistical comparisons to benchmark key financial indicators such as Return on Assets (ROA), liquidity, efficiency, solvency, and leverage. Findings show that firm size, capital structure, and operational efficiency significantly impact financial outcomes. Total Asset Turnover and Interest Coverage positively influence ROA, while Debt to Assets has a strong negative effect in F&D (R-squared = 0.542). The F&D sector exhibits higher sensitivity to debt and working capital inefficiencies compared to Energy and Healthcare, which benefit from more stable cash flows. Amid growing demand for sustainable and health-conscious food products in Vietnam, the study recommends adopting just-in-time inventory practices, refinancing high-cost debt, and leveraging data analytics to align production with demand. These insights guide managers, investors, and policymakers in enhancing competitiveness and supporting sustainable financing in Vietnam's F&D industry.

Key words: Food & Drink sector; benchmarking; financial performance.

THE IMPACT OF PRIVATE SECTOR GROWTH ON FINANCIAL INCLUSION: A CASE STUDY IN AN EMERGING ECONOMY

KT.NC.SV.24_28

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Advisor: PhD(c). Le Van Dao

Abstract

This study presents evidence elucidating the complex relationship between private sector development (PSD) and the Financial Inclusion Index (FII) in a transitioning economy. Given that the private sector, a significant driver of growth in Vietnam, is expanding, the research investigates whether this trend benefits workers in terms of financial inclusion. Utilizing panel data from 63 provinces in Vietnam spanning from 2010 to 2020, our results indicate that while private sector expansion generally enhances financial access, the transition of workers from the public to the private sector can diminish FII. This interconnection is influenced by the local institutional quality, whereby an increase in private sector employment and labor share contributes more positively to FII in regions characterized by high-quality institutions and economic development. Therefore, our findings underscore the critical role of institutional reforms and targeted policies aimed at ensuring that private sector growth translates into improved financial inclusion, particularly for marginalized communities.

Keywords: Financial Inclusion, Private Sector Development, Institutional Quality, Transitioning Economy

THE IMPACTS OF LIQUIDITY ON FIRM EFFICIENCY AND PROFITABILITY: EVIDENCE FROM VIETNAMESE LISTED FIRMS

KT.NC.SV.24_02

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Abstract

This study examines the impact of corporate liquidity on profitability and operational efficiency using a panel dataset of the 100 largest non-financial firms listed on the Ho Chi Minh City Stock Exchange (HoSE) over the period 2014–2023. Drawing on foundational theories including the Trade-off, Pecking Order, Signaling, and X-Efficiency hypotheses, the analysis evaluates how liquidity—proxied by the current ratio (CR) and quick ratio (QR)—influences firm performance metrics, namely return on assets (ROA), return on equity (ROE), and asset turnover ratio (ATR). Employing panel regression techniques (OLS, Fixed Effects, and Random Effects models), the results reveal a consistently positive and statistically significant relationship between liquidity and profitability indicators (ROA, and ROE). Conversely, liquidity exhibits a negative association with asset turnover, suggesting that excess liquid assets may hinder resource allocation efficiency. Furthermore, financial leverage (LEV) is negatively correlated with profitability, reinforcing concerns regarding debt overhang effects. Firm size also demonstrates a negative linkage with asset efficiency, potentially due to increased operational complexity and resource slack in larger firms. These findings underscore the strategic importance of liquidity management in enhancing profitability while cautioning against inefficiencies arising from excessive cash holdings. The study contributes to the existing literature by offering robust empirical evidence from a rapidly developing transition economy. It also provides managerial insights into optimizing financial structure and resource utilization under macroeconomic uncertainty, particularly within the context of emerging markets.

Keywords: Firm liquidity, Firm profitability, Firm efficiency, Vietnam.

ANALYZING THE IMPACT OF PERCEIVED VALUE ON RESTAURANT SERVICE REUSE INTENTION BASED ON ONLINE CUSTOMER FEEDBACK

KH.NC.SV.24_20

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Abstract

This study investigates the impact of perceived value on consumers' intention to reuse restaurant services by analyzing large-scale online reviews using advanced text-mining techniques. 29,209 reviews from 155 fast-food branches in Hanoi were collected and preprocessed. Using Latent Dirichlet Allocation (LDA), the study identified seven key perceived value indicators across three dimensions: quality, emotional, and price. Each review clause was then classified using a Support Vector Machine (SVM) model, and sentiment polarity was computed through a hybrid approach combining VADER and SentiWordNet. Subsequently, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the relationships among perceived value dimensions and behavioral intentions, including recommendation and repurchase. The results reveal that emotional value exerts the most decisive influence on reuse intention, positively affecting both recommendation and repurchase behaviors.The proposed framework demonstrates a scalable, data-driven approach 7 for extracting behavioral insights from unstructured online reviews, offering valuable guidance for enhancing customer-centric strategies in the fast-food sector.

Keywords: Perceived Value, Reuse Intention, Sentiment Analysis, Text Mining, Fast-Food Services

INTERNET OF THINGS (IOT) SMALL-DEVICES ARCHITECTURE USING RPL AND SECURITY PROBLEMS ANALYSIS

KH.NC.SV.24_03

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Abstract

Internet of Things (IoT) architecture has been integrated into various domains, such as healthcare, transportation, and smart home environments. It has imposed significant security concerns and is a critical problem in interconnecting. The IoT networks consist primarily of small, resource-constrained devices and rely on lightweight protocols, like the Routing Protocol for Low-Power and Lossy Networks (RPL), to manage routing efficiently but minimally. While effective for low-power communication, RPL's limited processing capabilities leave IoT networks vulnerable to cyber threats such as Blackhole, Selective Forwarding and Neighbor Attack. This paper explores the structure and limitations of IoT's small-device networks, examines security weaknesses within RPL, and proposes solutions through lightweight cryptographic implementations. By simulating cryptographic solutions on the Contiki emulator, we aim to identify secure and feasible methodologies to address security issues, apply lightweight cryptography theories, and provide examples of how this study will be applicable for educational purposes.

Keywords: Internet of Things (IoT), RPL, Contiki OS, lightweight cryptography

LICENSE PLATE RECOGNITION USING YOLO

KH.NC.SV.24_02

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Advisor: MSc. Do Tien Thanh

Abstract

This paper addresses the problem of automatic license plate recognition, focusing on two main tasks: detecting the license plate region and recognizing the characters within it. For the detection task, a morphological image processing approach is applied to accurately locate Vietnamese license plates under various real-world conditions. This method efficiently isolates the plate area, preparing it for the subsequent recognition stage. Character recognition is performed using a Convolutional Neural Network (CNN), specifically leveraging the YOLO (You Only Look Once) algorithm. YOLO is chosen for its ability to detect and classify multiple characters in a single step with high speed and precision. Its real-time performance makes it particularly suitable for applications in traffic monitoring and intelligent transportation systems. By combining classical image processing techniques for detection with deep learning for recognition, the proposed system offers a balanced and effective solution for automatic license plate recognition in the Vietnamese context.

Keywords: YOLO, License Plate Recognition, Neural Network, Image Processing

BUILDING SUPPLY CHAIN SYSTEM USING AI

KH.NC.SV.24_35

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Abstract

The efficient flow of medical devices is crucial in the healthcare industry and yet supply chains in this field are increasingly strained by unpredictable demand, logistical hurdles, and the need for rapid response after the disruption of Covid 19. Conventional forecasting techniques often fall short in adapting to these dynamic conditions, resulting in issues like delayed patient care or excess inventory costs. This research investigates the power of Artificial Intelligence (AI) and Machine Learning (ML)—with a focus on the XGBoost Model—to predict the ideal shipment method for new medical device shipments and to enhance the overall robustness and agility of the supply chain. By comparing the performance of these ML-based forecasting models against traditional statistical methods, this study aims to identify superior approaches for reducing delivery delays and improving the precision of inventory management. Using real-world datasets from the medical device manufacturing and distribution industry, we proposed a framework that will validate the effectiveness of AI-powered solutions in mitigating supply chain vulnerabilities. The expected outcomes will provide practical insights for integrating AI into medical device supply chain optimization, while connecting theoretical frameworks with practical industrial applications, and this will result in an interactive web platform on Google Collab for companies to forecast the best shipment method, leading to faster and more effective operational decisions.

Keywords: Medical device supply chain forecasting; Healthcare logistics; AI for supply chain management; Machine learning in healthcare.

RESEARCH ON DESIGNING A FLEXIBLE MOBILE BANKING APPLICATION USING AI VOICE BANKING

KH.NC.SV.24_22

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Abstract

In today's digital world, mobile banking applications are widely used due to their convenience. However, to certain user groups, including the elderly, people with disabilities, and those with visual impairments, it is a difficult thing. This research focuses on the design of a flexible mobile banking application that integrates AI Voice technology, enabling users to perform transactions such as fund transfers, balance inquiries, and bill payments entirely through voice commands. The application is designed to be accessible to all users, providing a hands-free and user-friendly banking experience.

Keywords: AI Voice Banking , Voice payments, digital banking, voice transactions, mobile banking

APPLYING RETRIEVAL-AUGMENTED GENERATION FOR KNOWLEDGE PROVISION ON VIETNAM'S PUBLIC INVESTMENT LAW

KH.NC_SV.24_14

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Advisors: Dr. Tran Duc Quynh, Dr. Nguyen Doan Dong

Abstract

Nowadays, to ensure the safety of individuals and families in terms of health, property and spirit, people's need to learn and consult legal issues is increasing. Therefore, a virtual assistant that can shorten the time to search for necessary information and provide complete and accurate information according to user requirements is extremely necessary. This study focuses on addressing the challenges associated with applying Vision Language Models (VLMs) and the Retrieval Augmented Generation (RAG) method, while also incorpo rating voice processing to resolve investors' inquiries about information for the public investing laws. We apply and evaluate the performance of two different RAG methods: Naive RAG and GraphRAG to find the most optimal information retrieval method for virtual assistants. In addition, techniques to improve the data embedding ability of the embedding model and VLMs are also applied and tested. The objective of this research is to enhance the knowledge and reasoning capabilities of VLMs to address clearly the requirements of investors, give them the most precise answer without hallucinations of VLM. The proposed approach includes fine-tuning the Large Language Model, utilizing Retrieval Augmented Generation combined with training high-performance retrieval models such as Embedding models, Reranking models, and BM25. Text-to-Speech, Speech-to-Text model and Vision Language Models are integrated, thanks to which the virtual assistant is able to receive information in both audio and visual instead of just from text data. We evaluated the quality of the virtual assistant based on the output comparison with GPT-4o and between the two RAG methods above.

Keywords: Virtual assistant, Vision Language Models, Retrieval Augmented Generation, legal information, Text-to-Speech, Speech-to-Text, embedding models, investors' inquiries, public investment laws.

A MULTI-MODEL FOR DISASTER TWEET CLASSIFICATION: FUSION OF TEXT AND IMAGE

KH.NC.SV.24_13
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Advisors: Assoc. Prof. Dr. Tran Thi Oanh, Dr. Kim Dinh Thai

Abstract

Natural disasters generate vast amounts of multimodal social media content, including text and images, which are valuable for real-time crisis analysis. This study presents an AI- driven framework for disaster-related content classification on Twitter, integrating natural language processing (NLP) and computer vision (CV) techniques. The framework utilizes XLNet for disaster detection, BERTweet for disaster type classification, and Gemini for intent and urgency classification in text, while EfficientNet- B4 assesses damage severity in images. A late fusion strategy combines the outputs of both pipelines, while weighted voting assigns appropriate importance to each modality based on their reliability, improving the overall classification accuracy. A high-quality, manually annotated dataset was used for training, ensuring reliable model evaluation. The fusion and weighted voting approach enhances disaster detection and damage assessment by leveraging complementary information from both text and images.

Keywords: multimodal learning, disaster classification, NLP, computer vision, late fusion, weighted voting, Twitter, real-time analysis.

THE MODEL PREDICTS THE POSSIBILITY OF RISKS IN FINANCIAL LENDING

KH.NC.24_16

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Abstract

This study presents a deep learning model for predicting the probability of default in financial lending, particularly aimed at digital banks, e-wallets, and unsecured lending services. The proposed model combines TabTransformer for structured financial data, FinBERT for processing loan purposes in natural language, and Concept Bottleneck Models (CBMs) to enable interpretable intermediate concepts such as risk scores and debt- to-income ratios. The dataset used in this research was collected from Vietnamese financial institutions and digital lending platforms, reflecting real-world borrower behavior. It includes both numerical and categorical features such as income, loan history, and employment status, as well as free-text descriptions of loan purposes. Key textual features were enriched using keyphrase extraction via TF-IDF. Conceptual features were engineered to capture borrower risk in a human-understandable manner. Experiments on a sample of 100,000 entries demonstrate strong performance, with low loss (≈0.2) and high accuracy (≥98%). These results highlight the model's potential to support automated credit decision-making, allowing digital lenders to minimize bad debt risk while removing the need for manual review. Furthermore, the framework sets the foundation for adaptive interest rate recommendations, where trustworthy borrowers may benefit from lower rates—moving beyond the conventional one-size-fits-all approach. By enhancing prediction accuracy and explainability, this model contributes to the development of intelligent, fair, and scalable lending systems. It offers practical implications for the adoption of AI in Vietnamese fintech and opens future research directions in dynamic credit scoring.

Keywords: Credit Risk Prediction, Deep Learning, Fintech, Concept Bottleneck, Automated Lending

ANALYSIS AND STRUCTURAL PREDICTIONS OF HUMAN PAPILLOMAVIRUS PROTEIN USING BIOINFORMATIC APPLICATION SOFTWARE

KH.NC.SV.24_24
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Advisors: Dr. Than Van Thai, MSc. Bui Nhat Le

Abstract

Human papillomavirus (HPV) proteins E6 and E7 are critical in the oncogenic transformation associated with HPV-related cancers. Accurate structural modeling of these proteins is essential for understanding their functional mechanisms and potential therapeutic interventions. In this study, we applied multiple computational approaches, including Protein Predict, NCBI databases, and AlphaFold, to determine the three-dimensional structures of E6 and E7 proteins. While initial modeling through Protein Predict and NCBI provided preliminary insights, the results lacked consistency and 6 completeness. The limitations of these approaches necessitated a more advanced methodology. AlphaFold, a deep-learning-based structure prediction tool, demonstrated superior accuracy and comprehensiveness in modeling the intricate structural features of E6 and E7 proteins. By leveraging the capabilities of AlphaFold, we achieved high-confidence predictions that aligned closely with experimentally validated structures, thereby confirming its reliability in protein modeling. This study also outlines the systematic workflow adopted to assess and validate protein structures. We describe the comparative analyses performed across different predictive models and the integration of biological datasets to refine structural accuracy. Additionally, the methodological advantages of AI-driven modeling are discussed, highlighting its implications in HPV-related oncogenesis research. Our findings emphasize the transformative potential of AI in structural biology, particularly in the context of viral oncogenes. The ability of AlphaFold to generate precise models of E6 and E7 proteins provides valuable insights into their functional dynamics, facilitating future studies on HPV pathogenesis and the development of targeted therapeutic strategies. These results underscore the necessity of advanced computational tools in modern molecular biology and reinforce the role of AI-driven approaches in decoding complex protein structures with high precision. Through a comprehensive evaluation of modeling techniques, this study establishes a foundational reference for researchers seeking to investigate HPV protein structures and their implications in disease progression.

Keywords: human papillomavirus, protein structure prediction, E6E7 protein, AlphaFold

THE RELATIONSHIP BETWEEN ACCOUNTING INFORMATION IN THE FINANCIAL STATEMENTS AND THE STOCK RETURNS OF LISTED FIRMS IN VIETNAM STOCK EXCHANGE

KH.NC.SV.24_36

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Advisor: Dr. Truong Cong Doan

Abstract

Objective: This study investigates how accounting information disclosed in financial statements—specifically earnings per share (EPS), changes in EPS, firm size, leverage, and market-to-book ratios—affects stock returns of firms listed on Vietnam's stock exchanges. It also assesses how global economic events and post- crisis recovery policies influence investor behavior and stock performance. Design/Methods/Approach: The research employs quantitative methods using panel data from 397 listed companies over the period 2019–2023, yielding 1,985 observations. Various econometric models including OLS, FEM, REM, GLS, and GMM were applied to estimate the relationship, with GMM addressing autocorrelation and endogeneity. Year dummy variables were included to evaluate the temporal impact of global events. Findings: The results confirm that EPS significantly and positively impacts stock returns, while changes in EPS show a limited effect. Market-to-book ratio positively moderates this relationship, while firm size and leverage have weaker or inconsistent influences. Moreover, global economic crises (2020–2022) and recovery policies (2023) significantly affected stock performance, validating the role of macroeconomic shocks and recovery trends. Policy implication: The findings highlight the continued relevance of accounting indicators in stock valuation while emphasizing the growing importance of macroeconomic context. This research supports improved financial reporting, market transparency, and the incorporation of dynamic modeling in investment decision-making in emerging markets like Vietnam.

Keywords: Keywords: Accounting information, stock returns, EPS

PAY BY SCANNING YOUR PALM

KH.NC.SV.24_15
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Abstract

Developing palm payment technology is in line with the development of technology as well as preventing information security incidents. In addition, with the current development accompanied by epidemics, change and prevention are necessary. The hand shows convenience and ease in urgent cases.

Keywords: Effectiveness, Solution, Information Security

MACHINE LEARNING MODELS FOR PREDICTING LEVEL OF ACCESS-TO-FINANCE OBSTACLE FOR SMES IN VIETNAM

KH.NC.SV.24_26

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Advisor: Assoc. Prof. Dr. Tran Thi Oanh

Abstract

Access to finance remains a critical obstacle for small and medium-sized enterprises (SMEs) in emerging markets, particularly in Vietnam. Traditional credit evaluation methods, which rely on financial statements and collateral, often exclude SMEs lacking formal financial records or credit history. This research applies machine learning (ML) models to firm-level data from the World Bank Enterprise Survey 2023 to predict the level of financial obstacles faced by Vietnamese SMEs. By leveraging a multidimensional dataset covering firm characteristics, infrastructure, innovation, labor, and regulatory environment, the study explores non-traditional indicators of financial access. A total of twelve models were trained and fine-tuned using techniques such as SMOTE for class balancing, feature engineering, and hyperparameter optimization. Evaluation metrics include accuracy, precision, recall, macro-F1 score, and confusion matrix, providing a holistic view of model performance. 7 The results reveal that ensemble models and deep learning architectures significantly outperform traditional approaches, with XGBoost and ANN achieving post-tuning accuracies exceeding 90%. Feature importance analysis highlights the predictive power of variables related to operational consistency, digital infrastructure, and firm formality - factors often overlooked in conventional assessments. This study contributes to the development of data-driven financial inclusion policies and supports efforts to tailor SME credit assessment frameworks to local economic contexts. By shifting from collateral-based lending to intelligent, multidimensional risk prediction, Vietnam and other ASEAN economies can better empower SMEs as engines of innovation and sustainable growth.

Keywords: SMEs, access to finance, machine learning, credit prediction, Vietnam

STUDYING AND APPLICATION OF ARTIFICIAL INTELLIGENCE FOR OVARIAN CANCER: A SYSTEMATIC ANALYSIS

KH.NC.SV.24_18

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Abstract

Ovarian cancer is one of the most dangerous gynecological diseases, with the highest mortality rate of all gynecological cancers. The development of artificial intelligence (AI) technology offers hope for significant improvements in the diagnosis, treatment and prognosis of the disease. Through the use of a systematic analysis method that successfully collected a large amount of data from about 2089 research articles taken from ScienceDirect and PubMed within the limited scope from 2010 to 2024, the study has provided the most general assessments of the typical application characteristics of each AI model used through the selection of collected data sets. Through the testing and selection steps, the study obtained results with 17 research articles that met the criteria set by the study. In addition, the study provides statistical tables with percentage data of parameters of each model, especially the Random Forest model with an accuracy rate of up to 99% for the application field of ovarian cancer. Some models such as Ensemble models and SVM also gave outstanding results with accurate diagnosis rates of 95.20% and 93.00%, respectively. Furthermore, the study was also successfully applied to a dataset of 153 patients at K Hospital in Vietnam, along with selective application of 3 models to produce the most optimal model. The optimization results also showed that the Random Forest model was the model with the highest optimization index, with nearly 100% accurate diagnosis rate compared to 75.86% of the traditional method. This study confirms the potential of AI to significantly improve the diagnosis, treatment and prognosis of ovarian cancer. Through a systematic review approach, the study with a diverse dataset has shown a breakthrough in the use of AI in medical applications better than traditional methods, clarifying the role of AI in practical applications.

Keywords: Artificial intelligence, Ovarian cancer, Systematic analysis.

COMPARATIVE ASSESSMENT OF BERT-BASED MODELS IN JOB MATCHING APPLICATIONS

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Abstract

The automated matching of job seekers with suitable employment opportunities represents a significant challenge in human resource management and recruitment technologies. Traditional methods relying on keyword matching have proven inadequate in capturing the semantic relationships between job descriptions and candidate resumes. In recent years, transformer-based machine learning models built for natural language processing (NLP) have emerged as powerful tools for understanding the contextual nuances in recruitment documents, potentially revolutionizing the process. This research comparatively evaluates four prominent transformer-based models in the context of job matching: BERT (Bidirectional Encoder Representations from Transformers), RoBERTa, DistilRoBERTa, and DistilBERT. Each model represents different approaches to the architecture, training methodology, and efficiency optimizations within the transformer framework. Experimental results show the distilled models consistently outperforming their full- size variants in most metrics while requiring significantly less computational resource to run. The results challenge the assumption that larger models necessarily perform better, highlighting that in specialized domains like job matching, smaller, efficient models can achieve comparable or superior results while consuming fewer resources. This has important implications for deploying such systems in production environments where computational efficiency is crucial. 5.

Keywords: Artificial Intelligence, Machine Learning, Natural Language Processing, Job Matching, BERT models

USING AI AND NON-INVASIVE RAMAN SPECTROSCOPY FOR DIABETES DIANOSIS

KH.NC.SV.24_23
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Abstract

This research explores the application of Convolutional Neural Networks (CNN) and Support Vector Machines (SVM), a widely used supervised machine learning algorithm, for the classification of Raman spectroscopy data in the context of developing an artificial intelligence (AI) system for diabetes diagnosis. The dataset used in this study was collected from real individuals in Vietnam and underwent preprocessing to eliminate background noise, ensuring data quality and integrity. Throughout the project, several model parameters were systematically optimized, including the number of training epochs, batch sizes, and network architectures. In the CNN model, architectural enhancements such as increasing the number of Conv1D filters and applying L2 regularization were employed to better capture data complexity and reduce overfitting. For the SVM model, rigorous evaluation was ensured using Repeated Stratified K-Fold Cross-Validation, which preserved class distribution across folds and improved reliability in performance assessment. These methodological refinements contributed to the models' improved classification capabilities and reinforced the role of data-specific tuning in enhancing diagnostic accuracy. Addressing a problem of such clinical importance necessitated significant resource investment, including time, technical expertise, and specialized equipment. While the broader scope of AI-assisted diagnostics spans numerous stages—ranging from sample acquisition and processing to system integration and clinical validation—this study concentrated primarily on the construction, training, and evaluation of machine learning models. Tasks such as spectroscopic measurement, hardware design, and procedural deployment were intentionally excluded to maintain focus on the computational 13 aspects of model development. Overall, the findings from this project underscore the potential of AI-powered tools in augmenting traditional diagnostic pathways for diabetes. Despite limitations, particularly in CNN's multi-class performance, the study offers a valuable foundation 5 for future advancements in AI-assisted healthcare screening, especially when paired with robust machine learning techniques and high-quality biomedical data.

Keywords: CNN, SVM, Raman spectroscopy, diabetes diagnosis, machine learning, AI healthcare, data preprocessing, model optimization, Vietnam dataset, biomedical classification.

ANOMALY DETECTION AND TREND FORECASTING OF BANKING STOCK PRICES IN VIETNAM USING CONVOLUTIONAL AND RECURRENT NEURAL NETWORKS

KH.NC.SV.24_27

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Advisor: Dr. Truong Cong Doan

Abstract

Financial markets exhibit high volatility and nonlinear dynamics, making it challenging to predict stock price movements and detect anomalies. Traditional forecasting models, such as statistical methods and classical machine learning techniques, often struggle to capture the complex temporal dependencies and hidden patterns in financial time series data. In response to these limitations, Financial Event Neural Network (FineNet), a hybrid deep learning model integrating Convolutional Neural Networks (CNN) and Gated Recurrent Units (GRU), is introduced to enhance Stock Market Prediction and Anomaly Detection in Price Movements. FineNet is implemented on the stock price data of Asia Commercial Bank (ACB), collected from the VNStock platform during the period of 2017–2025. In this model, CNN is responsible for extracting spatial-temporal features from historical data, while BiGRU models the sequential dependencies in both past and future time directions. The model is compared to common methods such as ARIMA, DRNN, and standalone GRUs, using evaluation metrics like accuracy, precision, and recall. FineNet demonstrates superior performance, with its ability to accurately detect abnormal financial behaviors. The model not only captures both short-term and long-term trends but also forecasts significant market fluctuations early, thus supporting more effective investment decisions. Based on the results from the FineNet model, the study also proposes investment strategies relying on anomaly analysis, helping investors make more timely and accurate financial decisions. This research contributes to the field of machine learning-based financial analytics, showcasing the potential of hybrid deep learning architectures in improving forecasting and risk detection in the stock market. Future research will focus on integrating macroeconomic factors and unstructured data sources, such as sentiment analysis and financial news, to enhance the model's practical applicability and performance in real-world financial environments.

Keywords: Deep Learning Convolutional Neural Network (CNN) Gated Recurrent Unit (GRU) Stock Market Prediction Anomaly Detection & Extreme Price Movement FineNet

EFFECTIVE FEATURE AUGMENTATION HYPERGRAPH LEARNING FOR TODDLER AUTISM SPECTRUM DISORDER CLASSIFICATION BASED ON EYE-TRACK

KH.NC.SV.24_04

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Advisor: Dr. Ha Manh Hung

Abstract

In this work we proposed an architecture designed for the classification of ASD in toddlers using eye-tracking data, addressing the critical need for early and precise detection. The proposed model incorporates FMMix, a feature-level augmentation technique that bolsters the model's learning capacity, and in this work we proposed the ATHENA, which captures intricate feature relationships via an adaptive hypergraph framework. Evaluated on two datasets of gaze coordinates the model achieves state-of-the-art performance, with AUC scores of 99.80% and 99.86%, respectively. It also exhibits high accuracy of 98.45% and 98.56%, sensitivity 98.01% and 98.10%, and specificity 98.74 and 99.02, respectively. Demonstrating its superior ability to identify subtle gaze patterns associated with ASD, these results significantly surpass existing methods, highlighting the model's potential for clinical ASD screening. Future efforts will focus on validation across broader populations and integration with multi-modal data to further refine diagnostic accuracy.

Keywords: Autism, Athena, Deep Learning, Eye Tracking, FMMix, Trajectory Mapping

APPLICATION OF ARTIFICIAL INTELLIGENCE AND BLOCKCHAIN IN PSYCHOLOGICAL ASSESSMENT

KH.NC.SV.24_21
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Abstract

This study builds a model integrating artificial intelligence (AI) and blockchain technology to assess signs of depression, anxiety, and stress disorders in the Gen Z generation in Vietnam. Nearly 30% of young Vietnamese citizens are limited by the constraints of subjective assessments from psychologists, stigma, and privacy concerns. We use a quantitative method combining the Depression, Anxiety, and Stress Scale (DASS21) with a voice emotion recognition system that identifies different emotional sounds: happy, annoyed, angry, neutral, and anxious. The model uses machine learning and deep learning techniques to analyze voice to detect psychological distress factors in users; simultaneously, Blockchain technology ensures the security, privacy, and transparency of data throughout the evaluation process. The report identifies significant gaps in the field of mental health care by providing user-friendly assessment tools and protecting sensitive data through decentralized encryption.

Keywords: Artificial Intelligence, Blockchain technology, voice recognition of emotion, stress, anxiety, disoders.

USING MACHINE LEARNING MODELS TO PREDICT UNDERNUTRITION TRENDS IN CHILDREN UNDER 5 YEARS OLD, APPLIED ON MICS DATASET OF VIET NAM

KH.NC.SV.24_28

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Advisor: Dr. Chu Dinh Toi, MSc. Vu Thi Hue

Abstract

Malnutrition, particularly underweight status among children, is a persistent public health issue in Vietnam. This study employs data from MICS2 to MICS5 (Multiple Indicator Cluster Surveys) spanning 2000–2015 to develop a predictive model for forecasting the prevalence of underweight children in future years. The analysis leverages machine learning techniques, incorporating key determinants such as age, socioeconomic status, maternal education, nutritional history, healthcare access, and immunization records to construct a robust prediction framework. Using Decision Tree Regression, the model achieves an accuracy exceeding 95%, effectively identifying patterns and risk factors associated with malnutrition. A time-series analysis of underweight trends across survey years reveals significant fluctuations in prevalence. The normal weight category has declined, whereas underweight and severely underweight cases exhibit periodic spikes, particularly around 2005 and 2020. Simultaneously, the prevalence of overweight and obese children remains relatively stable. These findings underscore evolving health challenges, highlighting the need for targeted interventions to address nutritional deficiencies in vulnerable populations. By extrapolating these trends through ARIMA forecasting, we project future malnutrition rates and provide evidence-based insights to support public health policy. The study aims to equip health officials, researchers, and policymakers with predictive tools to guide nutrition-focused interventions, ensuring early detection and prevention of childhood malnutrition in Vietnam's dynamic socio-economic landscape.

Keywords: Malnutrition, underweight children, Vietnam, MICS surveys, machine learning, Decision Tree Regression, time-series analysis, ARIMA forecasting, public health policy, nutrition intervention.

WILLINGNESS TO USE BIOSENSOR DEVICES FOR HEALTH CARE PURPOSES AND ITS RELATED FACTORS IN VIETNAMESE UNIVERSITY STUDENT

KH.NC.SV.24_12

Students:

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Advisors: Dr. Chu Dinh Toi, MSc. Vu Thi Hue

Abstract

In the context of biosensor technology revolutionizing and being widely applied in healthcare with its capability for real-time monitoring and feedback, the level of acceptance among Vietnamese students remains an open question warranting exploration. This study aims to evaluate the willingness of Vietnamese university students to use biosensor devices for healthcare purposes and to identify factors influencing their decisions. A cross-sectional descriptive study was conducted with 685 students aged 18 and older, utilizing an online survey distributed via Google Forms through student emails, social media, and academic forums from November to December 2024. Regarding experience, 51% of students had used wearable or continuous monitoring devices, while only 37% had used diagnostic tools, reflecting barriers to adopting complex devices. Key concerns included privacy (83.50%), social barriers (88.61%), and legal responsibility (89.78%), although prior usage mitigated concerns about communication barriers ($p=0.003$). Demographic factors such as gender, age, and income showed no significant impact. These findings underscore the urgent need 7 to enhance awareness and education about biosensor technology to foster acceptance among Vietnamese youth, thereby contributing to improved healthcare quality and accessibility in the future.

Keywords: Biosensor devices, Health care, Vietnamese university students, Health awareness.

APPLICATION OF ARTIFICIAL INTELLIGENCE IN PREDICTING THE BEHAVIOR OF CRYPTOCURRENCY INVESTORS

KH.NC.SV.24_19
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Advisors: Assoc. Prof. Dr. Tran Thi Ngan, Dr. Dong Van Chung

Abstract

The study investigates the integration of artificial intelligence (AI) and econometric models to predict cryptocurrency investor behavior. With the rapid growth of cryptocurrency as a financial instrument, understanding the complex dynamics of investor behavior is crucial for both investors and policymakers. This research develops a hybrid framework that combines the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model, which captures volatility, with the Error Correction Model (ECM), which examines the influence of macroeconomic factors on investor behavior. The study explores the impact of variables such as GDP, oil prices, inflation, and interest rates on the cryptocurrency market, offering insights into both short-term and long-term effects. The findings emphasize the importance of using these advanced models to predict market movements and provide practical tools for strategic investment planning. This work contributes to the growing body of knowledge on cryptocurrency investment by offering a globally relevant, context-specific framework.

Keywords: Cryptocurrency, Artificial Intelligence, Econometric Models, GARCH, Error Correction Model, Investor Behavior, Macroeconomics, Volatility, Predictive Modeling, Financial Markets.

SENTIMENT ANALYSIS OF CUSTOMER FEEDBACK FOR LOTTERIA CHAIN IN VIETNAM

KH.NC.SV.24_05
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Advisor: Dr. Truong Cong Doan

Abstract

Sentiment analysis plays a crucial role in understanding customer feedback, particularly in the service industry where emotional and personal experiences shape customer opinions. Given its importance, businesses increasingly rely on data-driven insights to refine their services and improve customer satisfaction. This study explores the use of advanced machine learning techniques to analyze customer sentiments from reviews of the Lotteria fast-food chain in Vietnam, leveraging a dataset comprising over 37,711 reviews. The research applies a stacking methodology, combining multiple machine learning models, including Support Vector Machine (SVM), Logistic Regression, Random Forest, Decision Tree, Naive Bayes, and XGBoost, into a unified framework to improve sentiment classification accuracy. By integrating these diverse models, the study aims to enhance predictive capabilities and achieve more reliable sentiment classification. Additionally, techniques such as oversampling and SMOTE are utilized to address class imbalance in the dataset, ensuring a more representative training process. The results indicate that the stacking approach significantly enhances predictive performance, achieving an accuracy of 90.15% with XGBoost as the meta-model. This demonstrates the effectiveness of model stacking in improving sentiment analysis. Moreover, the study highlights its practical applications for businesses seeking to enhance customer experience and optimize service quality through data-driven insights. The findings underscore the potential of sentiment analysis in helping businesses understand customer perspectives, refine marketing strategies, and make informed operational decisions.

Keywords: Machine Learning, Sentiment Analysis, Customer Sentiment Prediction, Imbalanced Data, Model Stacking

TRENDS IN MEASLES VACCINATION RATES FROM 2000-2021 IN VIETNAM CHILDREN UNDER 5 YEARS OLD AND RELATED SOCIO-ECONOMIC FACTORS

KH.NC.SV.24_30
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Advisors: Dr. Chu Dinh Toi, MSc. Vu Thi Hue

Abstract

This study researches trends and socioeconomic factors in measles vaccination coverage among children under 5 years old in Vietnam (2000-2021 period). The study used a longitudinal design, using data from 5 MICS surveys conducted by UNICEF in Vietnam from 2000 to 2021. After cleaning the data, the final sample size is 16914 in the analysis. The results show a large decline in vaccination coverage, from 56.17% in 1999 (MICS 2) to 9.96% in 2020-2021 (MICS 6), reflecting the lack of success in the country's immunization efforts. The study shows that there are regional disparities in the number of vaccinated children: the northern region is higher than the southern region. The southern region has the lowest indicators of vaccination card ownership and measles/MMR vaccination. The central region has high vaccination card ownership but lower vaccination coverage. Socioeconomic factors such as region, ethnicity, maternal education, and household wealth also significantly influenced vaccination rates. Children from rural areas, ethnic minorities, and children with low-education mothers or poor households were less likely to be vaccinated, showing the influence of geographic, cultural, and economic barriers. To overcome this, the study recommends implementing targeted interventions, including health teams in remote and mountainous areas, improving infrastructure, health education, and support for low-income families.

Keywords: Measles vaccination, MICS surveys, Vietnam children, socioeconomic disparities, immunization equity.

BUILDING A DIGITAL PATHWAY FOR INTERNATIONAL STUDENT GROWTH AND INTEGRATION

KH.NC.SV.24_34

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Advisor: Dr. Nguyen Van Tanh

Abstract

Vietnam is emerging as an energetic destination for international students; the sudden surge, however, has exposed huge gaps in the support systems required for their academic and personal success. This research explores all of these unmet needs and documents then the development of a digital platform just to alleviate the many challenges which face international students there in Vietnam, including language experience challenges, fragmented institutional information which is archaic, and access that is limited to useful resources. Using a mixed-methods approach, we conducted certain qualitative interviews with international students and faculty, alongside a quantitative Google Forms survey. Even though the range of our data collection remained limited due to time as well as to resources, the particular strong consistency in responses from the participants underscores the genuine importance of these said issues being properly addressed. Responding, our team built a Minimum Viable Product (MVP) with several key features in a help website: a University Information Hub using Google Maps and 360° campus views, a handbook of money-saving tricks and daily life tips, an interactive Food Map of local restaurants offering 360° views, and an Events and Activities section helping cultural exchange and networking. Our contribution conceptualizes future modules for platform administrators, business partners, and other areas within the community, e.g., company tour modules and agency partnership modules.

Keywords: International students, Platform, Support website.

VIETNAMESE TRAFFIC POLICE ACTION RECOGNITION IN COMPLEX SCENE FOR INTELLIGENT VEHICLE

KH.NC.SV.24_29

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Advisor: Dr. Ha Manh Hung

Abstract

Amidst the rapid advancements in AI and technology, autonomous vehicles have become indispensable, and real - time recognition of traffic police gestures plays a crucial role in helping self - driving cars understand and respond to traffic regulations. Since there is no existing dataset for gesture recognition in Vietnam, we addressed this gap by creating a completely new dataset, fully recorded and collected by our team. It includes nine official traffic police gestures recognized and applied under the Vietnamese Traffic Law, with around 300 videos per gesture, each lasting approximately 12 seconds. To enhance processing efficiency, we used the MediaPipe library to extract skeletal data (pose landmarks), which significantly reduced training time and improved model performance. We then experimented with various deep learning models to develop this system. The models successfully recognized the nine 2 gestures along with one additional class for non-gesture background scenes, using features based on the extracted skeletons. The results showed that the LSTM model achieved the highest accuracy of 92.28%, effectively classifying the gestures of traffic police officers. This marks a promising starting point toward future applications in intelligent traffic systems.

Keywords: traffic gesture recognition, Skeleton extraction, long short-term memory, Vietnamese traffic gesture detection, Vietnamese traffic police detection, autonomous vehicles

LEVERAGE LARGE LANGUAGE MODEL-BASED AUTONOMOUS AGENTS FOR REAL ESTATE CHATBOT

KH.NC.SV.24_06

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Advisor: Dr. Truong Cong Doan

Abstract

This study investigates the use of cutting-edge methods to enhance the functionality of a chatbot created to respond to inquiries on Vietnamese real estate law. Retrieval-Augmented Generation (RAG), the system's central component, enables big language models to retrieve external, domain-specific knowledge without requiring retraining. Conventional RAG techniques use semantic similarity in a vector space to retrieve information, but they frequently have drawbacks, such as contextual mismatches, distorted replies, and ineffective data querying. Our method focuses on semantic understanding and user-intent assessment to improve the retrieval and response generation stages to tackle these problems. Through the integration of sophisticated pretreatment and postprocessing techniques, as well as external API calls for inquiries that go outside the RAG's knowledge base, we have created a system that can assess itself and modify its results on the go. By contrasting the suggested model with traditional RAG-based systems, the study mainly examines how quickly engineering and retrieval optimization affect the precision and comprehensibility of the chatbot's responses.

Keywords: AgenticRAG, Large Language Model, Prompt Engineering

FORECASTING GOLD PRICE IN VIETNAM: THEAPPLICATION OF MACHINE LEARNING

KH.NC.SV.24_11

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Advisor: Dr. Truong Cong Doan

Abstract

Gold has long been considered a safe investment asset for investors, especially in the current period of financial, economic and political fluctuations globally. Therefore, having close access to applications or resources for reference will help investors plan their own strategies in the future. The research aims to build machine learning models to predict gold prices in Vietnam. This includes the SARIMAX model as well as deep learning models such as: Long short-term memory (LSTM), convolutional neural network (CNN) and convolutional recurrent neural network (CRNN). The study uses a dataset collected from 2010 to 2024, incorporating a variety of macroeconomic and geopolitical factors to demonstrate the effectiveness and feasibility of model building. By using machine learning techniques, this study improves the performance of the SARIMAX model by combining it with deep learning models to create hybrid models. These hybrid models are built using two meta models: Linear Regression (Linear model) and XGBoost (Nonlinear model). The experimental results in the study show that the nonlinear meta model, XGBoost, provides higher accuracy than the linear meta model (Linear Regression) when used in the hybrid model between SARIMAX and deep learning models. The study provides a technical approach in building machine learning models for the gold price prediction problem by proposing hybrid models using stacking rather than building a single SARIMAX model.

Keywords: Gold price prediction, Machine learning, SARIMAX, Stacking, Nonlinear meta model

APPLYING ARTIFICIAL INTELLIGENCE TO BUILD A LOAN RECOMMENDATION SYSTEM FOR CUSTOMERS

KH.NC.SV.24_31

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Advisor: Dr. Truong Cong Doan

Abstract

In the context of modern digital banking, providing personalized financial services has become an essential strategy for improving customer satisfaction, loyalty, and overall business performance. This study introduces an AI-based recommendation system that applies content- based filtering to offer customized loan suggestions for banking customers. The core objective is twofold: to recommend the most suitable loan products based on individual customer profiles and to maximize the bank's total operating income (TOI) by aligning these recommendations with profitability metrics. The proposed system leverages a rich dataset containing customer financial attributes, including income level, asset ownership (real estate, vehicles), credit card spending, savings, fixed deposits, and existing loan patterns. The results show that content-based filtering not only improves the relevance of loan product suggestions but also helps the bank prioritize high-value customers and optimize product offerings accordingly. The findings indicate that this. This research contributes to the growing field of intelligent financial systems by demonstrating how AI and data analytics can be harnessed to deliver dual value—empowering customers with relevant choices and enabling banks to make data-informed, profit-maximizing decisions.

Keywords: AI recommendation system, content-based filtering, personalized banking, loan suggestion, customer profiling, financial data analytics, total operating income (TOI), intelligent financial systems.

ACCESSING THE KNOWLEDGE AND ASSOCIATED FACTORS ABOUT TRAVEL-RELATED DISEASES AMONG UNDERGRADUATED STUDENTS IN HANOI

KH.NC.SV.24_32

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Advisors: Dr. Chu Dinh Toi, MSc. Bui Nhat Le

Abstract

In the context of increasing travel among young populations, especially university students, the risk of travel-related diseases (TRDs) has become a growing public health concern. This study seeks to assess the knowledge, attitudes, behaviors and preventive measures toward travel-related diseases (TRDs) of concern among undergraduates in Hanoi, Vietnam. An independent cross-sectional survey was conducted using a structured online questionnaire with 308 students. The average correct knowledge score was 55.4%, reflecting moderate awareness. While students showed strong recognition of diseases like COVID-19 (90.3%) and influenza (87%), their understanding of others remained limited - only 7.1% correctly identified polio risks, and just 13.6% for Hepatitis A. Notably, students from health and tourism majors demonstrated significantly higher awareness and confidence in preventive measures ($p < 0.05$). The findings highlight substantial disparities in disease knowledge, with major gaps in awareness of lesser-known but travel-relevant conditions. These results suggest the urgent need for targeted educational interventions, particularly for non-health-related students, to improve travel safety in an era of increasing global mobility.

Keywords: Travel-related disease, knowledge and behavior, university students

BUILDING A PREDICTIVE SPENDING MODEL FOR INTERNATIONAL SCHOOL - VIETNAM NATIONAL UNIVERSITY STUDENTS BASED ON INFLUENCING FACTORS

KH.NC.SV.24_08

Students:

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Advisor: Dr. Ha Manh Hung

Abstract

This study develops a predictive spending model for international students at Vietnam National University's International School (VNU-IS) by analyzing key factors influencing their financial behaviors. Using a mixed-methods approach, we collected data from 210 international students through structured questionnaires administered between October and December 2024. The survey examined four dimensions: personal demographics, income sources, living expenses, and cultural factors affecting financial decisions. Results revealed that respondents, predominantly from East Asia, reported income primarily from family support, scholarships, and part-time work, with major expenditures directed toward accommodation, food, and transportation. Multiple linear regression analysis identified significant relationships between spending patterns and factors including income level, living arrangements, and cultural background. The resulting predictive model demonstrated strong explanatory power, with monthly income, housing type, and cultural orientation toward saving emerging as key predictors. These findings provide valuable insights for university administrators and policymakers seeking to enhance international student experiences and financial wellbeing at Vietnamese institutions. This research establishes a methodological framework that can be adapted for similar analyses at other emerging education destinations while addressing the specific needs of international students navigating financial challenges within Vietnam's educational context.

Keywords: International students, predictive spending model, financial behavior, cultural influences.

STOCK PRICCE PREDICTION USING RNN, LSTM, GRU AND ATTENTION

KH.NC.SV.24_01

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Advisors: MSc. Do Tien Thanh, Dr. Nguyen Doan Dong

Abstract

This study aims to develop and evaluate a deep learning-based model for forecasting stock prices using a hybrid architecture that combines Recurrent Neural Network (RNN), Gated Recurrent Unit (GRU), Long Short-Term Memory (LSTM), and an Attention mechanism. The focus is to assess the effectiveness of this architecture in learning temporal dependencies and generating accurate predictions based on historical price data and technical indicators. Research Design, Approach and Method: The model was trained on historical stock price data of the S&P 500 index obtained from Yahoo Finance. Key features include raw financial indicators (Open_stock, High_stock, Low_stock, Close_stock) and technical indicators (SMA20, EMA20, Volatility20, and RSI). Data preprocessing involved handling missing values, normalization using MinMaxScaler, and a windowing technique to generate time-series sequences of 60 trading days. A hybrid sequential model was built, consisting of SimpleRNN, GRU, LSTM layers, and an Attention mechanism, followed by dense layers with dropout and batch normalization. The model achieved low error metrics (MAE ≈ 0.025 on the test set), indicating high accuracy. Additionally, the use of dropout, batch normalization, and learning rate scheduling contributed to improved generalization and reduced overfitting.

Keywords: Stock Price Prediction, Deep Learning, Financial Time Series, Time-Series Forecasting.

USING MACHINE LEARNING TO ANALYZE FACTORS AFFECTING THE CONVERSION RATE AND BUILD STRATEGIES FOR CONVERSION OPTIMIZATION ON AMAZON

KH.NC.SV.24_33

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Advisor: Dr. Ha Manh Hung

In this research, the main purpose is to analyze the impact of different independent factors on the conversion rate, a key metric in evaluating the performance of an e-commerce company. To have evident and data-driven results, we decided to use different data analysis techniques like Exploratory Data Analysis, as well as statistical metrics to estimate the importance of each independent variable with the targeted one. Additionally, various Machine Learning models have been used to predict the conversion rate based on history data. The models' performances were assessed using different metrics such as Coefficient of determination (R and Mean 2) square error (MSE). The results point out that the most effective model in predicting conversion rate for this company is CatBoost; other models like Gradient Boosting or Random Forest also have a decent performance. It was also proved that factors that have the biggest impact on the conversion rate are Order Item Session Percentage and Average Unit per Order Item. We also notice some seasonal trends and customer behaviours, thereby providing some practical recommendations for the company to improve the conversion rate in specific and the business performance in overall.

Keywords: conversion rate optimization, machine learning, e-commerce, statistical metrics

APPLYING LARGE LANGUAGE MODELS TO BUILD THE TOURMATE SMART TRAVEL SUPPORT PLATFORM

KH.NC.SV.24_17

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Advisor: Dr. Ha Manh Hung

Abstract

The integration of Large Language Models (LLMs) into the tourism sector is reshaping how travelers interact with digital services. This research introduces TourMate, a smart travel support platform that harnesses LLM capabilities to enhance the travel experience for both domestic and international tourists in Vietnam. The system features an AI-driven chatbot, personalized itinerary recommendations, and real-time travel insights, enabling seamless and adaptive assistance. By leveraging natural language processing and machine learning, TourMate can understand user preferences, suggest optimized routes, and provide trustworthy local service recommendations. This study examines the implementation of LLMs within TourMate, assesses their impact on user engagement, and explores challenges such as data reliability, multilingual functionality, and responsiveness. The findings offer valuable insights into the development of AI-driven tourism applications, contributing to the advancement of intelligent travel solutions.

Keywords: Large Language Models (LLMs), Artificial Intelligence (AI), Smart Tourism, TourMate, Natural Language Processing (NLP)

EARLY DETECTION OF AUTISM SPECTRUM DISORDER USING MACHINE LEARNING

KH.NC.SV.24_25

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Advisors: Dr. Ha Manh Hung, Dr. Pham Dinh Tan

Abstract

This research explores a novel approach for the early detection of Autism Spectrum Disorder (ASD) by integrating machine learning techniques with eye-tracking technology. The study converts raw eye-tracking data into scanpath images, thereby reframing the diagnosis of ASD as an image classification problem. A comprehensive preprocessing pipeline is utilized, which includes dynamic feature encoding and advanced data augmentation through a new method called FMMix1. This method enhances the visual representation of gaze movements by emphasizing the most informative areas of the data. The research compares various classical machine learning models with a Convolutional Neural Network (CNN), demonstrating that deep learning significantly improves classification performance. The CNN model was trained on a carefully partitioned dataset that includes eye-tracking data from 59 participants (29 diagnosed with ASD and 30 without), resulting in a total of 547 scanpath images. This model achieved a validation accuracy of up to 98.96%. This system utilizes readily available standard webcams rather than expensive specialized devices, making it a cost-effective and scalable solution. This design not only ensures high reliability under practical conditions but is also particularly suitable for resource-limited clinical environments. Overall, the integration of eye-tracking biomarkers with advanced machine learning models provides a robust diagnostic tool, enabling timely intervention and improving patient outcomes.

Keywords: Autism Spectrum Disorder (ASD) · Convolutional Neural Network (CNN) Eye-Tracking · Machine Learning · Predictive Modeling.

AR DEEP LEARNING BASED FRAMEWORK FOR SELF ASSESSING REHABILITATION EXERCISES

CN.NC.SV.24_07

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Doan Quoc Bao	SE	HE180053

Advisor: Dr. Ha Manh Hung

Abstract

This paper presents H3MS-GCN, a novel hybrid multi-moment deep learning model for assessing physical rehabilitation exercise quality, despite recent advances in deep learning for movement analysis, state-of-the-art methods still struggle with the inherent variability in patient movements and often fail to capture the complex spatio-temporal relationships critical for accurate rehabilitation assessment. To address these limitations, we propose a novel architecture that integrates five distinct processing streams, extending beyond conventional skeleton-based approaches to incorporate spatial frequency, statistical features, and topological relationships between joints. Evaluations on the KIMORE and UIPRMD dataset demonstrate that H3MS-GCN substantially outperforms state-of-the-art methods. Furthermore, we implement our model in a web-based application that provides real-time feedback on exercise performance, demonstrating its practical utility for home-based rehabilitation. The superior performance of H3MS-GCN establishes a new benchmark for rehabilitation exercise assessment and highlights its potential for improving patient outcomes through more accurate and reliable quality evaluation.

Keywords: Physical Rehabilitation, Mahalanobis Distance, Graph Convolution Network, Statistical, Spatial Frequency, Topological, Dual Dynamic HGNN

THE IMPACT OF GREEN TRANSFORMATION AND CARBON ACCOUNTING ON SUSTAINABLE DEVELOPMENT IN VIETNAM

KT.NC.SV.24_03

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Advisor: Dr. Nghiem Xuan Hoa

Abstract

This research aims to shed light on the impact of the green transition and carbon accounting on sustainable development, using Vietnam as a case study. A distinctive feature of this study is its dual approach to carbon accounting: territorial- based, which reflect emissions generated within national borders, and consumption- based, which account for emissions embedded in imported goods and domestic consumption. By combining both perspectives, the research provides a more comprehensive and nuanced assessment of sustainable development performance. To achieve this, the study utilizes time series data from 2000 to 2023 and employs the Vector Error Correction Model (VECM). This method allows the research to quantify both the long-term and short-term impacts of key variables such as renewable energy, urbanization, forest area, CO2 emissions, GDP, and SDG policy alignment on the constructed SDG score.

Keywords: Green transformation, Carbon accounting, Green industries, Sustainable development.

DETERMINANTS OF STUDENTS' CREATIVITY INTENTION IN PROJECT-BASED LEARNING (PBL): A THEORY OF PLANNED BEHAVIOR (TPB) APPROACH

KT.NC.SV.24_05

Student:

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Advisor: Dr. Tran Cong Thanh

Abstract

This study aims to examine the factors influencing students' creativity intentions in Project-Based Learning (PBL) environments using the Theory of Planned Behavior (TPB). It focuses on the roles of creative team climate, teachers' creative leadership, and school support for creativity. A quantitative approach was adopted. Data were collected via an online survey using Google Forms, yielding 313 valid responses from Vietnamese university and college students who participated in PBL courses. The data were analyzed using PLS-SEM 4. The study found that subjective norm was the most significant predictor of students' creativity intention in project-based learning contexts. Teacher's creative leadership had the strongest effect on students' attitudes toward creativity, while creative team climate had the most substantial influence on creative self-efficacy. In addition, school support for creativity through facilities, curriculum, and extracurricular opportunities played a foundational role in shaping a creative learning environment. Mediation analysis confirmed that all three environmental factors, including team climate, teacher leadership, and school support, indirectly influenced creativity intention through the mediating roles of attitude toward creativity and creative self-efficacy. This study proposes the first TPB-based model of creativity intention in Vietnamese PBL contexts. It offers a foundation for universities and instructors to design strategies that nurture student creativity and support the development of a workforce aligned with national innovation goals.

Keywords: Creativity intention, Creative team climate, Teacher's creative leadership, School support for creativity, TPB model.

THE IMPACT OF HEALING TOURISM ON THE MENTAL WELL-BEING OF VIETNAMESE UNIVERSITY STUDENTS

KT.NC.SV.24_08

Students:

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Advisors: Dr. Dao Cong Tuan, MA. Bui Vu Luong

Abstract

This study investigated the impact of healing tourism on the mental health of Vietnamese university students. Using a quantitative approach, the research analyzed data from 215 respondents collected via an online survey (Google Forms) between January and March 2025. The Depression, Anxiety, and Stress Scale (DASS-21) was used to measure students' psychological distress levels. Results from a multiple linear regression indicate that fourth-year students, those residing in Ho Chi Minh City, and married individuals exhibited significantly higher levels of distress. The second objective examined the mechanisms through which healing tourism may influence mental well-being. Respondents reported perceived benefits related to cognitive reframing, emotional regulation, and personal growth. The third objective analyzed students' perceptions and intentions regarding healing tourism. Stress reduction (80.2%) and emotional recovery (74.9%) were identified as key motivations, while accessibility and affordability were cited as major barriers. The study highlights healing tourism as a potential complementary mental health intervention for students, and recommends institutional partnerships, affordable programs, and digital promotion to increase adoption. These findings contribute to research on alternative mental health strategies in the Vietnamese higher education context in the future.

Keywords: DASS21; Mental Well-Being; TDP; Healing Tourism

INFLUENCING FACTORS OF ELECTRIC VEHICLES PURCHASING BEHAVIOR: ELABORATION LIKELIHOOD MODEL PERSPECTIVE

KT.NC.SV.24_11

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Advisor: Dr. Nguyen Ngoc Anh

Abstract

Research on sustainable consumer behaviors (SCBs) aims to understand the underlying patterns and motivations that drive individuals to make environmentally and socially responsible choices. In developing countries, where rapid industrialization has led to significant environmental and health challenges, green consumerism is gaining attention. However, traditional theoretical frameworks often fall short in capturing the complexity of consumer decision-making, particularly in high-involvement product categories like electric vehicles (EVs). This study applies the Elaboration Likelihood Model (ELM) to examine both cognitive (central route) and affective (peripheral route) influences on EV purchasing behavior, while also exploring the moderating roles of personal innovativeness, green lifestyle, and social media. Findings reveal that social media influencers significantly enhance both environmental knowledge and emotional value, which in turn positively affect buying decisions. Green lifestyle strengthens the effect of social media on these variables, while personal innovativeness only moderates the relationship between environmental knowledge and purchasing decisions. It does not significantly impact emotional value or the decision itself. These findings underscore the importance of integrating external influences and individual differences when analyzing green purchasing behavior. Nevertheless, the study is limited by its use of self-reported data and a non-representative sample. Future research should involve more diverse populations and consider complementary theoretical frameworks to gain deeper insights into sustainable consumer behavior.

Keywords: Social Media Influencer, Green Lifestyle, Personal Innovativeness, Environmental Knowledge, Emotional Value, Buying Decision.

THE IMPACT OF FOREIGN DIRECT INVESTMENT ON ENTREPRENEURSHIP: PROVINCIAL EVIDENCE IN VIETNAM

KT.NC.SV.24_13

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Abstract

The main objective of the article is to verify the impact of foreign direct investment (FDI) on entrepreneurship in 63 provinces in Vietnam. Although many studies have focused on the impact of FDI on economic growth in general, few studies have analyzed in depth the impact of FDI on startup activities in Vietnam. This research not only helps to better understand the relationship between FDI and entrepreneurship but also provides important information to guide economic development policies. The paper uses a panel model with fixed and random effects for the period between 2016 and 2020 to examine the effect of (FDI) on entrepreneurship. We employ a Hausman test to check whether fixed or random effect is more suitable. A test for the heterogeneous effects among economic regions is also provided. The findings show that FDI positively contributes to entrepreneurship in 63 provinces in Vietnam. However, the impact of FDI is different in different regions – the positive impact in the Southeast region, while the negative impact in the North Central and Central Coast region. FDI plays an important role in promoting start-up activities, however, to maximize the benefits from FDI, appropriate policies are needed to create a healthy business environment, encourage cooperation between FDI enterprises and entrepreneurships, and limit negative impacts. The authorities should have economic policies to attract FDI, and at the same time, these policies need to be adjusted to suit each locality and region.

Keywords: Foreign direct investment, entrepreneurship, economic regions, Vietnam.

THE ROLE OF AR MARKETING IN INFLUENCING TOURISTS' INTENTIONS IN PRESERVING VIETNAM'S CULTURAL HERITAGE

KT.NC.SV.24_14

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Abstract

Vietnam's rich cultural heritage is a cornerstone of its tourism industry, yet rapid tourist growth poses significant threats to heritage preservation. This study explores how Augmented Reality (AR) marketing can enhance tourist engagement while promoting sustainable heritage conservation in Vietnam. Drawing on case studies from prominent cultural sites such as Hoa Lo Prison, Thang Long Imperial Citadel, and the Hue Imperial City, the research investigates the role of AR in shaping tourists' behavioral intentions toward preservation. Grounded in theories of emotional engagement, anthropomorphism, and cognitive response, the study analyzes how AR features—such as vividness, interactivity, and immersion—influence enjoyment, cultural self-improvement, and a sense of heritage responsibility. Additional behavioral drivers such as feedback intention and referral intention are also examined to understand how AR experiences can foster community involvement and long-term support for conservation efforts. Using qualitative content analysis and real-world case data, this research highlights the potential of AR to bridge the gap between modern technological engagement and traditional heritage education. The findings suggest that well-designed AR marketing strategies can significantly increase tourists' appreciation, emotional connection, and commitment to heritage preservation. This study provides both theoretical insights and practical recommendations for leveraging AR to promote sustainable tourism development and protect Vietnam's cultural legacy for future generations.

Keywords: augmented reality, cultural heritage, tourism, preservation, visitor engagement, Vietnam, AR marketing.

DOES HOPE MATTER MORE THAN MONEY? EXPLORE INFLUENCING FACTORS ON CONTINUANCE INTENTION OF EV RIDE- HAILING SERVICES

KT.NC.SV.24_15

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Abstract

This study investigates the impacts of perceived behavioural impact and pride on continuance intention to use EV ride-hailing services across different levels of hope and monetary value in an emerging market - Vietnam. The rapid rise of electric vehicle (EV) ride-hailing services presents a unique opportunity to promote sustainable consumption. However, understanding the interactions of emotional and economic drivers of consumer adoption remains underexplored. This research seeks to uncover how emotions, like pride, and economic incentives influence continuance intention to use, providing valuable insights for both marketers and policymakers. We gathered data from 127 young consumers in Vietnam and used partial least squares structural equation modelling (PLS-SEM) to test the proposed hypotheses. Our findings show that perceived behavioural impact positively influences pride, yet pride does not have a direct, significant effect on continuance intention to use. Notably, monetary value acts as a positive moderator, transforming the relationship between pride and continuance intention from non-significant to significant. However, the moderating effect of hope on this relationship was not supported by our data.

Keywords: sustainable consumer behaviours, continuance intention, pride, hope, perceived behaviour impact, EVs ride-hailing services.

ROLE OF CAMPUS SERVICES IN FACILITATING INTERNATIONAL STUDENT ACCULTURATION IN VIETNAM

KT.NC.SV.24_16

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Advisor: Dr. Dao Cong Tuan

Abstract

Objective: This study aims to evaluate the role of on-campus services at the International School, Vietnam National University, Hanoi (VNU-IS), in facilitating the cultural adaptation of international students, identifying key challenges and proposing improvements to enhance service effectiveness.

Methods: A mixed-method approach was employed, combining quantitative surveys (n=38) using a Likert-scale questionnaire to assess service usage and satisfaction, and qualitative semi-structured interviews to explore personal experiences. Purposive and snowball sampling targeted international students with at least six months of study at VNU-IS. Data were analyzed using descriptive statistics for quantitative data and content analysis for qualitative data, guided by Berry's acculturation model and intergroup interaction theory.

Results: Findings indicate high satisfaction with faculty support (3.71/5) and extracurricular opportunities (3.53/5), but lower satisfaction with dormitories (2.16/5), transportation (2.11/5), and cultural activities (2.16/5). Language barriers, limited cultural exchange programs, and inadequate living conditions emerged as key barriers to adaptation. Academic support services were rated higher (2.91/5) than student life (2.52/5) and cultural services, highlighting uneven resource allocation. Regular intergroup interactions were found to enhance integration, while unmet needs in language support and social connection hindered adaptation.

Keywords: international students, cultural adaptation, on-campus services, VNU-IS, intergroup interaction, acculturation, higher education, Vietnam, student support, service quality.

FACTORS INFLUENCING TOBACCO CONSUMPTION BEHAVIOR IN THE CONTEXT OF PROPOSED TAX INCREASES IN VIETNAM

KT.NC.SV.24_18

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Advisors: Dr. Le Huong Linh, Dr. Ho Nguyen Nhu Y

Abstract

This study aims to examine the relationship between tobacco tax policy and consumer behavior in Vietnam, with a particular focus on how different consumer groups adapt to tax increases and the coping mechanisms they use to maintain tobacco consumption. Through this lens, the research seeks to provide insights that can support the development of more effective economic policies tailored to Vietnam's socio-economic context. The study seeks to provide evidence-based insights that can inform more effective and equitable tobacco control policies aligned with Vietnam's public health and socio-economic development goals. Adopting a qualitative approach grounded in behavioral economics, the study draws on four key theories, Bounded Rationality, Rational Addiction, Mental Accounting, and the Theory of Planned Behavior. In-depth interviews were conducted with 40 tobacco users from diverse socio-economic backgrounds to capture the range of adaptive strategies and purchasing behaviors in response to taxation. The research reveals that consumers often circumvent tax increases by switching to cheaper brands, buying cigarettes individually, using hand-rolled tobacco, or turning to illicit products. These coping strategies reduce the effectiveness of taxation, particularly among low-income and long-term users. Behavioral responses vary across demographic groups, highlighting the need for targeted policy interventions. The findings offer practical implications for policymakers aiming to strengthen Vietnam's tobacco control efforts.

Keywords: Tobacco taxation, consumer behavior, Vietnam, adaptive strategies, behavioral economics, qualitative study.

UNDERSTANDING SUSTAINABLE CONSUMER BEHAVIOR IN ELECTRIC VEHICLE ADOPTION: EVIDENCE FROM HANOI, VIETNAM

KT.NC.SV.24_22

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Abstract

This study examines the determinants of electric vehicle (EV) adoption among consumers in Hanoi, Vietnam, using an integrated framework derived from the Theory of Planned Behavior (TPB), Value-Belief-Norm (VBN) theory, and Financial Incentive Policy (FIP). A structured survey collected data from 391 urban residents, and analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM). Findings highlight that environmental consciousness significantly enhances consumer self-efficacy, subsequently strengthening social norms toward EV adoption. Notably, financial incentives emerged as a critical factor, directly increasing consumers' purchase intentions and indirectly moderating relationships between psychological and social constructs. Contrary to initial expectations, government incentive policies did not significantly impact consumer self-efficacy, possibly reflecting skepticism toward policy consistency. Additionally, demographic control variables such as income and education showed negligible effects, emphasizing the dominance of psychological and normative factors. Theoretically, this research contributes to the existing literature by demonstrating the viability and enhanced explanatory power of an integrated TPB–VBN–Policy model, which effectively bridges rational, normative, and contextual drivers of sustainable consumer behavior. Practically, the findings suggest that policymakers should adopt multifaceted strategies incorporating targeted financial incentives, expanded EV infrastructure, and strategic public communication emphasizing both economic and environmental benefits. This approach is critical for converting consumer intention into widespread EV adoption, particularly within emerging markets. Future studies are encouraged to address methodological constraints, broaden geographic scopes, and further explore the interplay between intrinsic and extrinsic motivations, ensuring robust and generalizable insights into sustainable mobility transitions.

Keywords: Electric vehicle adoption, financial incentives, Sustainable consumer behavior Vietnam, TPB-VBN integration.

EXPLORING THE ROLES OF PATRIOTISM, CONSUMER ETHNOCENTRISM, NATIONALISM, AND SELF-RELIANCE IN SHAPING VIETNAMESE CONSUMERS' WILLINGNESS TO REPURCHASE

KT.NC.SV.24_25

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Advisors: Dr. Bui My Trinh, Dr. Dao Cong Tuan

Abstract

In the context of global economic integration and increasing competition between domestic and imported goods, this study explores the role of patriotism in shaping Vietnamese consumers' intention to repurchase domestic products and what key factors are influencing the relationship between them. The study draws on the Theory of Planned Behavior (TPB), the Stimulus-Organism-Response (SOR) framework, and Social Identity Theory to build the research model. A mixed methods approach was used, combining a quantitative survey of 340 Vietnamese consumers with qualitative content analysis of seven domestic brands to collate the findings. Structural equation modeling using PLS-SEM was conducted to assess the relationship between the constructs. The results show that consumer nationalism, brand reputation, and perceived product quality act as important mediators between patriotism and intention to repurchase. Attitudes towards the "Vietnamese people prioritize using Vietnamese goods" campaign also play an important role in enhancing product quality awareness and repurchase intention. Furthermore, the study found that consumer knowledge of the product moderates the relationship between patriotism and repurchase behavior, suggesting that those with higher product knowledge tend to translate patriotic sentiments into concrete actions.

Keywords: Patriotism, Consumer Ethnocentrism, "Vietnamese people use Vietnamese products" Campaign, Perceived Quality, and Willingness to Repurchase.

ENHANCING CUSTOMER EXPERIENCE THROUGH AI- POWERED MARKETING: EXAMING HOW AI-DRIVEN CHATBOTS IMPACT USER ENGAGEMENT, SATISFACTION AND BUYING RETENTION.

KT.NC.SV.24_30

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Abstract

The growing adoption of AI-powered chatbots in marketing and customer support has changed the way organizations interact with customers. While chatbots are well-known for their efficiency and cost-effectiveness, their influence on user engagement, contentment, and retention is poorly understood. The research intends to investigate the role of user gratifications. (utilitarian, hedonic, technological, and social) in driving chatbot engagement, assess how engagement influences satisfaction and retention, and evaluate the moderating influence of privacy concerns in chatbot adoption. The Research provides a comprehensive understanding of consumer behavior in AI-powered interactions by integrating Use and Gratifications Theory (U&G) and Perceived Risk Theory (TPR). A quantitative research study technique was used, utilizing survey data from 179 respondents who have interacted with AI chatbots across different industries, including e-commerce, banking, and customer service. SmartPLS 4 used Structural Equation Modeling (SEM) to study the relationships among chatbot gratifications, user engagement, satisfaction, retention, and privacy concerns. The study also used confirmatory factor analysis (CFA) to analyze construct validity and reliability, and bootstrapping approaches to test the relevance of hypotheses. Findings: The results show that users are mainly motivated by practical benefits and the technological appeal of chatbots. However, privacy concerns were a significant barrier to chatbot adoption. While chatbots improved customer satisfaction, they did not lead to long-term retention, suggesting that other factors such as trust and human involvement are necessary to keep customers loyal. Policy Implication: Businesses should focus on improving the practical features of chatbots, addressing privacy concerns. Ensuring transparency and data security can help build trust with customers, leading to better long-term engagement and satisfaction.

Keywords: AI-driven chatbots, User engagement, Privacy concerns

ADOPTION OF GREEN MOBILITY IN VIETNAM: KEY INFLUENCING FACTORS AND IMPLICATIONS

KT.NC.SV.24_33

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Abstract

Vietnam faces severe air pollution challenges, particularly in urban centers like Hanoi, where PM2.5 levels often exceed WHO guidelines, posing significant risks to public health and the environment. The transportation sector, dominated by fossil fuel-powered vehicles, contributes substantially to greenhouse gas emissions and urban congestion, necessitating a shift toward green mobility solutions such as electric vehicles, bicycles, and public transit. This study investigates the factors influencing the adoption of green mobility among Vietnamese consumers and identifies barriers impeding its widespread acceptance. Utilizing a quantitative approach grounded in the Theory of Planned Behavior (TPB) and Stimulus-Organism-Response (SOR) frameworks, data were collected from 449 respondents via a structured questionnaire and analyzed using SmartPLS 4. Vietnam encounters significant challenges related to air pollution, particularly within urban locales such as Hanoi, where concentrations of PM2.5 frequently surpass the guidelines established by the World Health Organization, thereby posing considerable threats to public health and the surrounding ecosystem. The transportation sector, which is primarily characterized by vehicles reliant on fossil fuels, plays a pivotal role in the generation of greenhouse gas emissions and exacerbates urban congestion, thereby necessitating a transition towards sustainable mobility alternatives, including electric vehicles, bicycles, and public transportation systems.

Keywords: Green mobility; Sustainable transportation; Consumer adoption; Climate change; Carbon neutrality

THE IMPACT OF ESG ON RIDE-HAILING SERVICE IN THE ELECTRIC VEHICLES INDUSTRY: A CASE STUDY OF XANH SM

KT.NC.SV.24_34

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Abstract

Alarming environmental issues such as global warming, climate change have been challenging in recent decades. This makes modern companies adopt ESG practices in their operations to reduce carbon emissions and protect the environment. At the same time, environmentally-conscious customers are increasingly assessing the firm's commitment to ESG efforts. Hence, This research aims to examine how ESG practices impact customers' purchase intention of ride-hailing service adopting electric vehicles through mediating variables: Brand Image, Perceived Value and Attitude with the consideration of moderating variables: Price Sensitivity and Convenience in the context of Xanh SM- A subsidiary of Vinfast. To explain the process from perceiving ESG practices to purchase intention and build up the research model, this research uses a combination of theory: Signaling theory and Theory of Planned Behaviour. The questionnaire survey method was employed to collect 233 responses from participants and this research uses SmartPLS version 4.1.1.2 to analyze the data. The results reveal that ESG practices impact on Purchase intention under the partial mediation of Brand Image, Perceived Value and Attitude. However, price sensitivity and convenience do not have any moderating effect as expected. This research not only has theoretical contributions based on both signaling theory and theory of planned behavior to explain decision-making process for customers after understanding ESG practices, but also gives practical advice for both firms and policy-makers.

Keywords: Xanh SM, perceived ESG, environment, social, governance, brand image, perceived value, attitude, purchase intention, price sensitivity, convenience.

FACTORS IMPACT EXPATRIATE CAREER SUCCESS IN MULTINATIONAL CORPORATIONS: THE MEDIATING ROLE OF EXPATRIATE'S CROSS-CULTURAL ADJUSTMENT

KT.NC.SV.24_36

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Advisor: Dr. Dao Cong Tuan

Abstract

The study investigated the impact of biculturalism and cultural intelligence on cross cultural adjustment and expatriate career success. Additionally, this study also examined the mediating effect of cross-cultural adjustment on the relationship between cultural intelligence, biculturalism, and expatriate career success. The partial least squares structural equation modeling was used to evaluate data from a survey of 244 expatriates employed in multinational corporations (MNCs) across several nations. The research findings demonstrated the positive effect of biculturalism and cultural intelligence on cross-cultural adjustment, as well as the influence of biculturalism and cultural adjustment on expatriate career success. Furthermore, the results provided significant insight into the impact of cross-cultural adjustment on the ability to enhance the indirect effects of cultural intelligence and biculturalism on expatriate career success in various cultural contexts. Considering that prior studies have seldom recognized the mediating function of cultural adjustment for the relationship between cultural intelligence, biculturalism and expatriate career success. These findings could be highly valuable for scholars seeking further validation and for human resource professionals in the recruitment and management of expatriates.

Keywords: Cultural intelligence, biculturalism, cross-cultural adjustment, expatriate career success, multinational corporations.

EFFECTS OF INNOVATION ON TRADE: NEW EMPIRICAL EVIDENCE FROM VIETNAM

KT.NC.SV.24_37

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Advisor: Dr. Dong Van Chung

Abstract

Early identification of competitive advantages for companies is extremely necessary in today's developing era. Technological innovation has also become one of the extremely important factors contributing to the economic growth of corporations as well as a country. There have been many studies on technological innovation activities on a country's trade and in this study, we will delve into exploiting that correlation in a specific developing country in Vietnam. We use the panel probit model and data from the World Bank Enterprise Survey in the period from 2005 to 2023 to find the correlation coefficients that can be used to re-impact the new change factors on trade in Vietnam. The use of independent variables and control variables will give the most objective results for researchers to make the most accurate judgments on this topic. With the research results, we believe that this information will be most meaningful to researchers as well as help to propose appropriate policies for the government in the national economic development.

Keywords: Process innovation, product innovation, trade performance, developing country

THE IMPACT OF INSTRUCTOR HUMILITY, STUDENT CYBERLOAFING ON STUDENT ENGAGEMENT: THE MODERATING ROLE OF ACTIVE LEARNING

KT.NC.SV.24_39

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Abstract

Grounded in conservation of resources theory (COR), we examine how active learning moderates the relationship between instructor humility and cyberloafing, and its subsequent impact on student engagement. We propose that cyberloafing may serve as a restorative mechanism in response to challenging tasks, particularly when instructors demonstrate humility. The contrasting perspectives on cyberloafing - as either detrimental or potentially restorative - present a compelling theoretical puzzle. This study seeks to empirically examine this tension, investigating the conditions under which cyberloafing may serve a beneficial function. We find that cyberloafing is positively associated with both behavioral and cognitive student engagement. While instructor humility directly predicts cyberloafing, its influence becomes less nuanced under the moderation of active learning. These results highlight the potential of cyberloafing as a restorative tool for boosting student engagement, particularly in demanding learning environments characterized by instructor humility. Moreover, this study challenges the traditional view of cyberloafing, demonstrating its potential restorative function in education. We expand its theoretical understanding to include self regulation and resource replenishment, and highlight the positive link between restorative cyberloafing and student engagement, advocating for a nuanced approach that emphasizes instructor humility and mindful technology use to foster student well-being and success.

Keywords: cyberloafing, instructor humility, active learning, student engagement, conservation of resources theory, restorative behavior, higher education

THE INFLUENCE OF POWER ON OPPORTUNISTIC BEHAVIOR IN BUYER - SUPPLIER RELATIONSHIPS: A SOCIAL EXCHANGE PERSPECTIVE

KT.NC.SV.24_40

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Abstract

This study investigates the mediating role of affective trust in the relationship between supplier power and supplier opportunism within buyer-supplier relationships. Grounded in Transaction Cost Economics (TCE) and Social Exchange Theory (SET), the research proposes that different bases of supplier power indirectly influence supplier opportunism through affective trust. Specifically, it is hypothesized that supplier power shapes the level of affective trust that purchasing agents place in their supplier agents, which subsequently impacts both weak-form and strong-form opportunism. We employ partial least squares structural equation modeling (PLS-SEM) using survey data collected from 548 purchasing agents in Vietnam. The findings indicate that referent power and legitimate power positively influence affective trust, whereas coercive power exerts a negative effect. Notably, reward power was found to have no significant impact on affective trust. Additionally, affective trust was observed to negatively affect strong-form opportunism while unexpectedly showing a positive relationship with weak-form opportunism. These results highlight the function of emotional trust as a mediator in the power-opportunity connection, providing practitioners and academics with important information for managing buyer-supplier relationships successfully, improving supply chain management and strategic decision-making.

Keywords: Referent power, coercive power, reward power, legitimate power, affective trust, strong form opportunism, weak form opportunism, Vietnam

THE COMBINED IMPACT OF CULTURAL ELEMENTS AND LIVESTREAM FACTORS ON CONSUMER PURCHASE INTENTIONS

KT.NC.SV.24_43

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Abstract

This research titled "The Combined Impact of Cultural Elements, Livestream Factors and Authenticity Information on Consumer Repurchase Intentions" is conducted with the purpose of analyzing and clarifying how cultural cues, livestream shopping features, and perceived authenticity affect the repurchase behaviors of Vietnamese consumers, especially Gen Z. The research framework is developed based on the Stimulus-Organism-Response (S-O-R) theory, integrating both secondary data sources and findings from quantitative research. In this model, key variables include Streamer characteristics, Interaction, Popularity, Product Authenticity, Corporate Authenticity, Service Provider Authenticity, Cultural Elements (indexical and iconic), Trust, Loyalty, Engagement, and Repurchase Intention. The target participants of the survey are consumers residing in Hanoi and nearby cities, who have purchased at least once via livestream platforms such as Shopee Live, TikTok Shop, and Facebook Live.. The research applies a quantitative approach, using a structured questionnaire distributed online and successfully collecting 350 valid responses. The analysis is performed using SPSS and SmartPLS to test the reliability, validity, and the structural relationships among the variables. As a result, most of the examined variables are found to have significant effects on internal consumer states such as trust and loyalty, which in turn influence repurchase intentions.

Keywords: Cultural factor, livestream, authenticity, repurchase intention.

WHEN ILLUSION BECOMES GOLD: CAPTIVATING GEN Z IN THE LUXURY TASTE REVOLUTION

KT.NC.SV.24_44

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Advisor: MSc. Nguyen Thi Huong Ly

Abstract

This study aims to explore factors contributing to purchase' decisions of Gen Z through the digital society, these factors related to social status, self-worth, self-image congruence, sustainability, social motivation, peer pressure and influencer effects. Specifically, this study also figures out the importance of the Gen Z customer segment in the future highlights the need for luxury brands to pay closer attention and develop effective marketing strategies to attract young customers and build brand loyalty. This study will employ a mixed-methods approach, combining quantitative surveys with qualitative analysis to provide a well-rounded perspective on purchasing's decisions of Gen Z. This approach will allow for a detailed influential factors of purchasing luxury goods and personality concerns while capturing user perceptions.

This study explores the most influential factors affecting Gen Z's purchasing decisions for luxury goods, including influencer effects, alignment with self-worth, and self-image congruence. These factors shape how Gen Z perceives luxury, with a preference for brands that are transparent, authentic, and socially responsible. To leverage these factors in the digital age, luxury brands need to adopt creative strategies, such as interactive digital content, influencer partnerships, and personalized online experiences to build strong connections with Gen Z. Additionally, brands must balance their exclusive image with diversity and inclusivity, respecting Gen Z's expectation for representation and inclusiveness. The findings suggest that luxury brands can figure out the way to approach and strategies to captivate Gen Z consumers through emotional connection that enhance consumer loyalty.

Keywords: Gen Z, Luxury brand, Status consumption, Digital age, Sustainability.

THE IMPACT OF DISCOUNT CODES ON ONLINE SHOPPING BEHAVIOR OF CUSTOMERS IN VIETNAM

KT.NC.SV.24_45

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Advisor: Assoc. Prof. Dr. Luu Thi Minh Ngoc

Abstract

The Internet is increasingly becoming an indispensable source of "food" for humans, bringing new innovations and convenience to life. One of them is the change in shopping behavior leading to new terms: e-commerce, discount code and online shopping. This leads to a stronger shift in business to the B2C (Business-to-consumer) model, businesses connect directly with consumers to consume products online, especially on e-commerce platforms. To promote customers' shopping behavior, businesses especially launch discount codes to stimulate consumers' purchasing power. Realizing that discount codes directly affect customers' shopping needs for products, we built a research paper using data collection methods based on 223 survey samples to evaluate the above issue. The results of the experiment showed that discount codes actually have a direct impact on the purchasing power of customers when they are provided with discount codes by businesses.

Keywords: online customer behaviour, discount code, online shopping, purchasing power, e-commerce.

THE IMPACT OF DIGITAL TRANSFORMATION ON INNOVATION: FIRM- LEVEL MICRO EVIDENCE IN VIETNAM

KT.NC.SV.24_46

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Advisor: Dr. Dong Van Chung

Abstract

This study explores the impact of digitalization on innovations (product and process innovation) in Vietnam enterprises. Empirical analysis utilizes the World Bank Enterprise Surveys (WBES) dataset of Vietnamese firms across four years (2005, 2009, 2015, and 2023), with the firms primarily operating in manufacturing and service sectors. We employ an instrumental variable (IV) probit model to address potential endogeneity concerns in the relationship between technology adoption and innovation outcomes. The study finds that, in the context where digitalization in firms is only implemented in the early stages, digitalization has a significant negative impact on product innovation while the relationship between digitalization and process innovation is positive. Empirical results demonstrate that the influence of digitalization on innovation activities is consistent across firm size, ownership types, and exporting versus non-exporting enterprises. Moreover, the study also find that skilled labor has an indirect effect on innovation activities at firms. Based on these findings, the study offers some recommendations.

Keywords: Digitalization, Product Innovation, Process Innovation, Vietnam.

UNDERSTANDING FACTORS INFLUENCING VIETNAMESE UNIVERSITY STUDENTS' STOCK INVESTMENT DECISIONS

KT.NC.SV.24_47

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Advisor: Dr. Le Thi Mai

Abstract

This study was conducted to find out the factors affecting the decision to invest in stocks among Vietnamese students. The study was conducted through the method of multivariate linear regression. Data were collected using a questionnaire with a sample size of more than 200 students from universities in Vietnam. The questionnaire is the main and only source of primary data, containing personal information (year of study, gender, interest in investing in stocks, etc.). With the survey results of "not interested in investing in stocks", "not Vietnamese" will be eliminated immediately because it is not within the scope of the research topic. Participants were asked to give their opinions on the factors affecting the decision to invest in stocks based on a 5-level Likert scale. When analyzing the data collected from the questionnaire, only 3 independent variables have a positive impact on investment decisions: Financial Knowledge (FK), Market Sentiment (MS), and Personal Financial Needs (PFN). Of these, the variable "Financial Knowledge" is the most important for individual investors to apply and make accurate investment decisions. With the remaining 4 variables, there is no statistical significance. After completing our research, here are some recommendations. Before making an investment decision, prepare a sufficient amount of knowledge to avoid risks by analyzing the market, and paying attention to the financial information of the business, ...

Keywords: Stock Investment, Financial Knowledge, Market Sentiment, Personal Financial Needs, Vietnam, Student.

IMPACT OF COMPASSION, COLLECTIVIST CULTURE, AND CLIMATE CHANGE ANXIETY ON DONATION BEHAVIOUR ON SOCIAL MEDIA: THE CASE OF A NATURAL DISASTER IN VIETNAM

KT.NC.SV.24_51

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Advisor: Dr. Bui My Trinh

Abstract

This research investigates the effects of compassion, collectivist culture, and climate change anxiety on social media donation behavior amid the increasing occurrence of natural disasters in Vietnam due to climate change, especially the Yagi typhoon. Based on the stimuli–organism–response (SOR) model and Dual Concern Theory, we establish the conceptual model of compassion, collectivist culture and climate anxiety influences on monetary and time donation intention with the mediating role of empathetic concern, perceived impact, care for environment and care for future generations. The quantitative research adopted a survey of 432 social media users in Vietnam and analyzed it using structural equation modeling. The results indicate that compassion, collectivist culture, and climate change anxiety indirectly impact on donation intentions, with the essence of mediating variables. Compassion has the strongest effect on donations intention, while collectivist culture is followed to get the associated impact, climate change anxiety stands in the last position to affect the intention to donate. In addition, the report also gives a qualitative approach highlighting sophisticated comprehension of the ways in which environmental fear, collectivist ideals, and compassion interact after a major natural disaster to influence both short-term emotional reactions and long-term social media contribution behavior.

Keywords: Compassion, Collectivist Culture, Climate Change Anxiety, Donation Intention, Social Media, Natural Disaster

THE DYNAMICS OF ALTRUISM IN CYBERSPACE: A STUDY OF SOCIAL MEDIA, EMPATHY AND DONATION BEHVIOUR IN VIETNAM

KT.NC.SV.24_52

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Advisors: Dr. Bui My Trinh, Dr. Dong Van Chung

Abstract

Taking this study in the context of social media, this study investigates the intricate dynamics of conspicuous donation behavior (CDB) and its impact on pro-social intentions and cultural influences. The research draws on such theoretical frameworks as Self-Perception Theory, Social Identity Theory, Competitive Altruism Theory, and Habit Forming Theory to explain how these frameworks explain the motivation of CDB and what the tool has on a person's personal identity and social dynamics. Social media is emphasized as a medium for promoting CDB as they serve as a means of social recognition and validation, resulting in increasing prosocial behaviors. A cross-sectional survey design was used to collect the data, which included 340 valid responses from adult residents of Vietnam. The structural model analysis supported seven of the twelve proposed hypotheses. Self-monitoring, materialism, and empathy are significant key antecedents of CDB, whereas self-esteem does not have a significant relationship with them. Uncertainty avoidance, masculinity, and power distance are not correlated with CDB, whereas collectivism significantly increases. Additional CDB increases emotional social support. There is moderate to strong explanatory power of this model towards CDB variance explained. Moreover, CDB has a positive effect on intentions of volunteering time and money. Both intentions are substantially affected by altruism, but past donation experience only influences the intention to donate money. The insights obtained in this study demonstrate the interplay of culture and society along with psychological factors in the propagation of conspicuous donation behaviors, which are useful for the practical implication in developing charitable promotion in the digital age.

Keywords: Conspicuous donation behaviour, Social media, Empathy, Altruism, Typhoon Yagi

INFLATION DYNAMICS IN VIETNAM: DOES UNCERTAINTY MATTER?

KT.NC.SV.24_55

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Advisor: Dr. Nghiem Xuan Hoa

Abstract

This paper offers fresh perspectives on the effects of policy-related uncertainty on inflation through linking the current knowledge on the macroeconomic implications of policy uncertainty to the literature on inflation dynamics. We explore Vietnam's inflation process utilizing the New Keynesian Phillips Curve (NKPC) model. Interest rates, a key predictor of inflation, are regularly demonstrated to generate theoretically incompatible results. Furthermore, previous researches lack a consistent approach to measuring uncertainty, a crucial model component that may influence the results. As a result, in the current research, uncertainty is assessed using two independent approaches: the World Uncertainty Index and the Oil Price Index. We utilize econometric analysis to follow the variables driving inflationary pressures in Vietnam from 1996Q2 to 2023Q3. Our major findings reveal that interest rates, nominal GDP, global uncertainty, and money supply have no substantial impact on Vietnam's inflation between 1996Q2 and 2023Q3. Furthermore, the currency rate and oil price factors have a beneficial impact on inflation. In this article, we describe the fundamental causes of inflation and discuss policy implications.

Keywords: Policy-related uncertainty; Inflation; World Uncertainty Index (WUI); New Keynesian Phillips Curve (NKPC)

THE IMPACT OF CHATGPT ON GENZ TRAVEL DECISION-MAKING IN VIETNAM: A STUDY OF AI-INFLUENCED SOCIAL MEDIA VERIFICATION

KT.NC.SV.24_57

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Abstract

The rapid advancement of AI, particularly language models like ChatGPT, has significantly influenced modern travel planning. This study examines how Vietnamese GenZ travelers integrate ChatGPT's recommendations into their travel decision-making process, focusing on the role of social media verification. The mixed-methods approach is applied, including quantitative surveys and qualitative interviews of 258 people in Hanoi who belong to GenZ. It explores the importance of social media verification affecting their trust in ChatGPT's recommendations, and which factor of social media impacts the most. This research aims to provide more insights into the evolving digital travel landscape and its implications for the tourism industry.

Keywords: AI, ChatGPT, GenZ, travel decision-making, social media verification, trust, tourism industry, Vietnam

THE IMPACT OF HOUSEHOLD HEAD'S GENDER ON FINANCIAL BEHAVIOR IN VIETNAM FAMILIES

KT.NC.SV.24_59

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Advisor: Dr. Dong Van Chung

Abstract

This study aims to examine how the gender of the household head influences financial behavior within Vietnamese households, focusing on areas such as spending, saving, investment, and risk tolerance. The study also explores the moderating role of financial literacy in shaping these gendered financial behaviors. A cross-sectional survey was conducted with 300 respondents across various provinces in Vietnam. Quantitative methods were employed, including Cronbach's alpha reliability testing, Exploratory Factor Analysis (EFA), Pearson correlation, and Multivariate Analysis of Variance (MANOVA), to analyze the relationships among gender, financial literacy, and financial behavior. The results reveal that female-headed households tend to prioritize essential spending and saving, while male-headed households engage more in high-value investments and show greater risk tolerance. Financial literacy moderates these behaviors by narrowing gender gaps in various aspects of household financial management. The findings suggest that financial education programs can promote more balanced and responsible financial behaviors across genders. However, for truly inclusive financial empowerment, policy interventions should also address cultural norms and intra-household power dynamics that limit women's participation in large-scale financial decisions.

Keywords: gender gap; household head; financial behavior; financial literacy; Vietnam.

STRATEGIC DIVERSIFICATION IN A FRAGMENTING GLOBAL ECONOMY: A TRADE DIAGNOSTIC OF VIETNAM–NIGERIA ECONOMIC

KT.NC.SV.24_61

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Abstract

Amid rising global trade fragmentation and escalating protectionist measures most notably the comprehensive U.S. tariff hikes in 2025—export-oriented economies like Vietnam face renewed urgency to diversify trade partnerships. This study investigates the Vietnam–Nigeria trade corridor as a potential South–South diversification strategy, which remains understudied in existing literature. Employing a multidimensional diagnostic framework that integrates the Revealed Comparative Advantage (RCA), Trade Complementarity Index (TCI), Trade Intensity Index (TII), Export Specialization Index (ESI), and Export Sophistication Index (EXPY), the research evaluates both structural alignment and realized trade performance between the two countries. Vietnam specializes in light manufacturing and processed goods, while Nigeria exports resource-based commodities. However, trade realization remains modest—driven by low TII scores, high tariff and non-tariff costs, and institutional frictions. While Vietnam's export sophistication (EXPY) approaches the threshold of developed economies, Nigeria's remains low but gradually improving. This asymmetry underscores untapped potential for vertical trade and technology transfer. The study contributes to the literature by integrating structural, behavioral, and developmental trade metrics into a single framework, offering actionable insights for policymakers seeking to recalibrate trade strategies in the context of global uncertainty. It advocates targeted trade facilitation, product-level coordination, and strategic alignment under the South–South cooperation paradigm.

Keywords: Vietnam–Nigeria Trade, Trade Complementarity, Export Sophistication, Trade Intensity, South–South Cooperation.

SEIZING MOMENTUM ON CLIMATE ACTION: NEXUS BETWEEN NET-ZERO COMMITMENT CONCERN, DESTINATION COMPETITIVENESS, INFLUENCER MARKETING, AND REGENERATIVE TOURISM INTENTION

KT.NC.SV.24_62

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Abstract

The growing global awareness of climate change and sustainable development is pushing industries, especially the tourism industry, to move towards a more environmentally responsible direction. In this context, regenerative tourism has emerged as a new model, not only minimizing negative impacts but also aiming to restore ecosystems, cultures and local communities. Especially in countries with strong climate commitments such as the UAE, this model is highly practical and in line with the orientation of sustainable development. This study was conducted to analyze the factors affecting tourists' intention to participate in regenerative tourism, including: awareness of Net-Zero commitment, destination competitiveness, influencer marketing and subjective norms. The model was built based on the Theory of Planned Behavior (TPB) and social influence theory. Data from 389 valid surveys were analyzed using SmartPLS 4.0 software. The results show that all four factors have a positive impact on regenerative tourism intentions, in which subjective norms are the strongest influencing factor. The model achieves a high fit (R2 = 0.803) and ensures reliability and measurement criteria. The study contributes to expanding the theory and providing practical recommendations for destination managers, tourism operators and policy makers in promoting responsible tourism behavior.

Keywords: Regenerative tourism; Net-Zero commitment; Destination competitiveness; Influencer marketing; Subjective norms; Sustainable tourism behavior.

THE IMPACT OF GREEN MARKETING ON FEMALE CONSUMERS' PURCHASE DECISIONS FOR VEGETARIAN COSMETICS

TC.NC.SV.24_08

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Advisor: MA. Pham Thanh Huyen

Abstract

This study investigates the influence of green marketing strategies on female consumers' purchase decisions for vegan cosmetics. The research examines key factors including eco-labels and certifications, green price, green place, green promotion, environmental awareness, and subjective norms. Grounded in the Theory of Planned Behavior (TPB), the study explores how these factors shape consumers' purchase intentions and their eventual purchase decisions. Additionally, the moderating role of brand trust is analyzed to assess its influence on the relationship between purchase intention and actual purchase behavior.

A mixed-methods approach is adopted, combining surveys and focus groups to evaluate the effectiveness of green marketing strategies. The research assesses how practices such as eco-labeling, sustainability certifications, and green promotional efforts enhance consumer trust and engagement. The findings highlight that environmental awareness and subjective norms are critical drivers of consumer preference, while green pricing, green place, green promotion, and eco-labels significantly influence purchase intention. Moreover, the study reveals that brand trust reinforces the link between purchase intention and final purchase decisions, underscoring the importance of building consumer confidence in ethical brands. This research provides strategic insights for businesses seeking to align with the rising demand for sustainable and vegan cosmetic products.

Keywords: green marketing, vegan cosmetics, female consumers, eco-labels and certifications, green price, green place, green promotion, environmental awareness, subjective norms, purchase intention, brand trust, customer purchase decision.

HOW TRUST AND INTIMACY DRIVE COOPERATIVE BEHAVIORS IN SUPPLY CHAINS: A CONTIGENCY APPROACH.

KT.NC.SV.24_66

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Advisor: Dr. Nguyen Ngoc Anh

Abstract

This study investigates the impact of depth intimacy and receptive intimacy on affective trust, the impact of affective trust on cooperative behaviour, and their impact in different psychological safety environments among purchasing agents in Vietnamese companies. This study was collected from 220 individuals working in purchasing or B2B related positions in Vietnamese companies. To test the hypotheses, we used the least squares structural equation modelling (PLS-SEM). The results show that receptive intimacy has a positive effect on affective trust, while the effect of depth intimacy on affective trust is not very positive, not statistically significant for affective trust. Notably, in environments with high psychological safety, the effects of different types of intimacy on affective trust are in the opposite direction compared to before. Under the influence of psychological safety, Depth intimacy has a statistically significant positive effect on affective trust, while receptive intimacy seems to have no statistical significance on affective trust in psychological safety environments. Surprisingly, affective trust has a positive effect on cooperative behaviors. This effect is even stronger in environments with high psychological safety. This study has both theoretical and practical implications. Theoretically, the study differentiates between different forms of intimacy and their impact on affective trust in environments where psychological safety exists and does not.

Keywords: Trust, Intimacy, Cooperative Behaviors, Psychological Safety, Vietnam

ENTREPRENEURIAL EDUCATION AND ENTREPRENEURIAL COMPETENCIES IN ENTREPRENEURIAL INTENTION: THE MODERATING ROLE OF INNOVATIVENESS AND PROACTIVENESS

KT.NC.SV.24_69

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Advisor: Dr. Dao Cong Tuan

Abstract

This study aims to examine the relationship between entrepreneurial education and entrepreneurial intention, with a specific focus on the mediating role of self-employment competencies and the moderating effects of innovativeness and proactiveness. The research investigates which personal characteristics enhance educational intervention effectiveness toward developing entrepreneurship behavior in university students. Data were collected from 415 undergraduate students enrolled in entrepreneurship-related courses at four universities.The research deployed Partial Least Squares Structural Equation Modeling (PLS-SEM) as its quantitative approach to analyze the established relationships. The study demonstrates that entrepreneurial education builds entrepreneurial competencies which in turn directly and indirectly affect students' entrepreneurial intention. Innovativeness and proactiveness act as significant moderators which enhance the impact of education on intentions according to the research findings. This research enhances current knowledge by establishing individual entrepreneurial orientation as a main component for designing effective entrepreneurship education systems. Educational programs that develop innovation and proactive traits among students energetically influence their entrepreneurial intention.

Keywords: entrepreneurial education, entrepreneurial competencies, attitude towards entrepreneurship, entrepreneurial self-efficacy, entrepreneurial intention

GREEN UNIVERSITY INITIATIVES AND THE IMPACT OF GREEN FACTORS ON UNDERGRADUATES' REUSE INTENTION FOR ENVIRONMENTAL SUSTAINABILITY

KT.NC.SV.24_17

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Advisor: Assoc. Prof. Dr. Nguyen Phuong Mai

Abstract

Environmental sustainability has become a critical global concern, particularly in developing countries like Vietnam, where waste management and resource conservation remain significant challenges. This study investigates the factors influencing undergraduates' reuse intention for environmental sustainability in Vietnam. Utilizing the Theory of Planned Behavior (TPB), the research examines the impact of Green University Initiatives (GUI), Personal Attitude (PA), and Perceived Behavioral Control (PBC) on reuse intention (RI). Additionally, Environmental Awareness (EA) and Price Sensitivity (PS) are introduced as supplementary variables to provide a comprehensive understanding of behavioral motivations. Data collected from 533 undergraduate students using the snowball sampling method were analyzed through Partial Least Squares Structural Equation Modeling (PLS- SEM) and Multi-Group Analysis (PLS-MGA). The findings reveal that GUI positively influences PA and PBC, which significantly impact RI. EA and PS play a crucial role in fostering sustainable behavior and positively impacting reuse intention. Furthermore, GUI's impact on EA is the highest, followed by its influence on PA. These results offer practical implications for universities and policymakers to design targeted programs and campaigns that promote reuse behavior among students, contributing to environmental sustainability efforts in Vietnam.

Keywords: Green University Initiatives (GUI), Reuse Intention (RI), Environmental Awareness (EA), Price Sensitivity (PS), Reusable product.

SUSTAINABLE SHOPPING AND THE CHALLENGE FOR GENERATION Z: THE KEY TO THE GROWTH OF GREEN CONSUMPTION

KT.NC.SV.24_71

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Advisor: MSc. Nguyen Thi Huong Ly

Abstract

The research findings indicate that sustainable consumption behavior among Generation Z follows a closely linked process that begins with awareness and attitude, eventually translating into actual purchasing behavior. Through surveys and linear regression analysis, the study identified key initial factors influencing attitude formation, including environmental concern, affordability, convenience of green products, and media influence. These factors directly affect perceived personal benefits and perceived green quality, two crucial mediators that foster a positive attitude toward green consumption. In turn, this attitude serves as the foundation for developing sustainable purchasing behavior in practice. In the context of escalating climate change and environmental degradation, exploring sustainable consumption behavior among Generation Z, a tech-savvy and trend sensitive consumer group with widespread influence holds significant theoretical and practical value.

Keywords: Green consumption behavior, sustainable shopping, generation Z (Gen Z), environmental concern, attitude toward green products, perceived personal benefits, perceived green quality, high price perception, media influence.

BRIDGING DIGITAL INEQUALITY IN THE INFORMAL ECONOMY: AN INTEGRATED MODEL OF TECHNOLOGY ADOPTION AMONG INFORMAL WORKERS IN HANOI, VIETNAM

KT.NC.SV.24_12

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Advisors: Dr. Ta Huy Hung, Dr. Le Thi Mai

Abstract

Understanding the impact of digital transformation on informal workers is important for promoting inclusive economic development, especially in rapidly urbanizing areas. This study aims to investigate the factors influencing the adoption of digital technologies among informal workers in Ha Noi, Vietnam. Drawing on the Technology Acceptance Model (TAM) and the Digital Divide Theory, the research examines how perceived usefulness, perceived ease of use, digital access and digital skills affect workers' behavioral intention to adopt digital tools in their economic activities. Data were collected from 389 informal workers across Ha Noi using purposive sampling. The survey instrument was developed based on validated constructs from previous studies. To analyze the data, the study employed the Partial Least Square Structural Equation Modeling (PLS-SEM) technique using SmartPLS software. The measurement model was evaluated for reliability and validity and the structural model was used to test the hypothesized relationships among the constructs. The findings reveal that both perceived usefulness and digital skills have a significant positive influence on the intention to adopt digital tools. In contrast, perceived ease of use shows a weaker influence and limited access to digital infrastructure remains a critical barrier.

Keywords: Digital Transformation, Informal Workers, Digital Inclusion, TAM, Digital Divide, Technology Awareness, Digital Competence, Access and Affordability.

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