



# ABSTRACT PROCEEDING BOOK

**International Conference on  
Multidisciplinary Business,  
Engineering, Science & Technology  
Innovation**

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## BOOK OF ABSTRACTS PROCEEDINGS

***Innovate to Thrive:***  
***International Conference on Multidisciplinary Business,  
Engineering, Science & Technology Innovation***

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*Amsterdam August 2024*

*International Conference on Multidisciplinary Business, Engineering,  
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### **Core Values**

- **Inclusiveness and Affirmative Action:** Commitment to creating a diverse and equitable environment for all.
- **Promotion of Academic and Research Ethics:** Upholding the highest standards of integrity in academic and research practices.
- **Respect for Individual Rights:** Ensuring access to learning, growth, opportunities, and privacy for everyone.
- **Adherence to Research Ethics:** Maintaining rigorous standards of ethical conduct in research activities.
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- *Engineering & Technology Studies*
- *Social Science & Humanities*
- *Physical Life and Applied Sciences*
- *Regional and Religious Studies*
- *Multidisciplinary and Interdisciplinary Studies*





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*Dr. Tariq Iqbal Khan*

“Experts of Academic Excellence and Research is a platform dedicated to supporting the global scholarly community in analyzing the role of multidisciplinary innovations for the advancement of human societies. It encourages academicians, practitioners, scientists, and scholars from various fields to collaborate, sharing ideas on how to foster interdisciplinary interactions and address societal challenges effectively. The research presented at this conference is exceptional, promising, and impactful, targeting issues faced by various sub-domains of the Society for Business, Economics, Social Science & Humanities; Society for Engineering & Technology; and Computer, Basic & Applied Sciences, Society of Medical & Health Sciences.

I would like to extend my gratitude to our esteemed scientific and review committee members for dedicating their valuable time to the review process of the papers presented at this conference. I am also deeply grateful to the participants for contributing to our mission of promoting knowledge sharing and learning. As scholars, we form a crucial part of the educated class responsible for benefiting society through our knowledge. Let us overcome all forms of discrimination and view the broader perspective. Together, let us work for the betterment of humanity, striving to make the world a harmonious and flourishing place. Stay blessed.

Thank you.

*Dr. Tariq Iqbal Khan*  
*Director*



**TRACK A**  
**MULTIDISCIPLINARY STUDIES**



# BAYESIAN GENERALLY WEIGHTED MOVING AVERAGE CHARTS FOR LINEAR PROFILE MONITORING

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In many industrial applications, the quality of a process can be described by one or more specific functions between explanatory variables and response variables, and this type of data is called profile data. Checking the stability of such functional relationships using statistical methods is called “profile monitoring”. There are many literatures on linear profile monitoring, but a few works on monitoring of linear profiles using Bayesian methods. Currently, only Bayesian EWMA, Bayesian DEWMA and Bayesian CUSUM control charts are used to monitor changes of linear profile of processes. In order to improve the detection ability of small shifts, the generally exponentially moving average (GWMA) chart is proposed for different process environments and showed that the chart is superior to the GWMA and EWMA control charts in monitoring small process mean shifts. According to different priors and process parameters, the goal of this work is to establish the Bayesian GWMA control chart to monitor the intercept, slope and error variance of the linear profile model, and make a comprehensive comparison with its counterpart charts.

***Keywords: Bayesian Method, Detection Ability, Linear Profile, GWMA Charts***



# THE EFFECT OF INNOVATION POLICIES ON THE INNOVATION PERFORMANCE OF HIGH-TECH ENTERPRISES IN HAINAN

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As one of the four leading industries in the construction of Hainan's free trade port, vigorously developing high-tech enterprises is an inevitable choice for Hainan to realize its innovation-driven development strategy and to catch up from being a latecomer to realizing the curved-track overtaking. In this process, innovation policy and digital transformation will play a pivotal role in the development of high-tech enterprises and affect their innovation performance. Based on this, this paper firstly emphasizes the importance of innovation policy and digital transformation on the innovation and development of high-tech enterprises in Hainan; secondly puts forward the three research objectives of this paper; then discusses the research methodology from the research design, the research sample, the sample size, the sampling method and the questionnaire design; finally, the study concludes that the innovation policy and the digital transformation have a positive impact on the innovation performance, and that the digital transformation plays a mediating role in the innovation performance. innovation policy and innovation performance play a mediating role, so as to provide a reference for the government to promote the development of high-tech enterprises.

***Keywords: High-Tech Enterprises, Innovation Policy, Digital Transformation, Innovation Performance***



# LIMITATIONS OF APPLYING TRADEMARK EXHAUSTION DOCTRINE ON SERVICES

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Trademark exhaustion doctrine is also called the “first sale doctrine.” It means that a proprietor cannot claim their trademark right if a “good” has firstly been sold and its ownership transferred within domestic, foreign, or regional markets. Although a trademark can represent both “goods” and “services,” trademark exhaustion doctrine or first sale doctrine applies only to “goods” but does not extend to “services.” Therefore, trademark parallel importation for “goods” is permissible due to the application of the exhaustion doctrine. In contrast, trademark parallel importation for “services” is denied because the exhaustion doctrine is not applicable. Whether for “goods” or “services,” consumers can exploit the “price discrimination” for legitimate trademark parallel importation. However, importers are restricted from offering identical or similar “services” represented by trademarks, which constitutes trademark infringements. Therefore, it violates the principle of “trademark exhaustion doctrine” or “first sale doctrine.” This study adopts two different research methodologies: (1) Literature review: academic books, law journal articles, and masters’ theses related to issues of applying trademark exhaustion doctrine to “services” are fully examined. (2) Case analysis: this study comprehensively analyzes Taiwanese courts’ decisions regarding issues of applying trademark exhaustion doctrine to “services” because Taiwanese trademark right protection is the first-to-file system, and it is different from the U.S. one, which is the first-to-use system. By analyzing relevant literature and cases, this study found that consumers could not fully enjoy the interests of “price discrimination” if importers cannot use registered trademarks for identical or similar “services” offered by licensing branches or agents because importers are banned from using identical or similar “services” by registered trademarks due to trademark infringements. “Service” marks are commonly used in markets, including parallel importation, which is legal due to the “international exhaustion doctrine” acknowledged globally. Therefore, parallel importation is legal whether “trademarks” or “service” marks are used in markets, and both are equally not constituted trademark infringements under the “trademark exhaustion doctrine” or “first sale doctrine.” The contribution of this study is that it proposes that the scope of the “exhaustion doctrine” covers both “trademarks” and “service” marks. Thus, parallel importation is legally represented by “trademarks” and “service” marks under the Trademark Act.

***Keywords: Trademark, Exhaustion Doctrine, First Sale Doctrine, Goods, Services, Parallel Importation***



# ENHANCING LANGTON'S ANT ALGORITHM FOR SECURE MESSAGE ENCODING THROUGH CUSTOMIZABLE INITIAL CONDITIONS

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This paper explores an innovative enhancement to the Langton's Ant algorithm for secure message encoding by introducing customizable initial conditions. Our approach allows users to specify the starting position of the ant, thereby personalizing the encoded messages and increasing the complexity and security of the encoding process. By varying the initial conditions, each encoding session produces a unique pattern, making unauthorized decoding significantly more challenging. Through detailed experimentation and analysis, we demonstrate the efficacy of this method in creating secure, hard-to-crack encoded messages. The customizable initial conditions not only enhance the security but also add a layer of user interaction and personalization. This study highlights the potential of leveraging Langton's Ant's algorithm for advanced cryptographic applications, pushing the boundaries of traditional encoding techniques. Our findings invite further exploration into the integration of simple algorithmic behaviors with complex security requirements, showcasing a novel intersection of theoretical computer science and practical cryptography.

***Keywords: Langton's Ant Algorithm, Secure Message Encoding, Customizable Initial Conditions***



# EFFICACY AND SAFETY OF CHINESE EYE EXERCISE OF ACUPOINTS IN REDUCING DRY EYE SYMPTOMS

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The prevalence of dry eye disorder (DED) can be attributed to the prolonged use of digital screens in modern lifestyles. In Chinese educational institutions, the Chinese Eye Exercise of Acupoints (CEA) has been used for over five decades to alleviate ocular discomfort that may be related to DED. However, there is limited evidence regarding the impact of CEA on DED. This study examines the efficacy and safety profiles of CEA as an alternative treatment for DED, compared to the standard lid hygiene treatment (STD). Fifty-six DED participants were enrolled from Thammasat University Hospital. Inclusion criteria required participants to have experienced DED symptoms for over three months; OSDI questionnaires (Thai version), Tear Break-Up Time (TBUT), and Schirmer 1 Test (SIT) results identified that they have DED. Exclusion criteria included uncontrolled disease or abnormalities that could impact DED symptoms, pregnancy, or breast-feeding. In this single-blind, randomized, controlled trial, eligible participants were assigned using block randomization. One group received (CEA), and another received STD. Equipment, video demonstrations, and practical handouts were provided to participants. They were trained for self-practice and checked for correction via video call. OSDI, visual acuity, TBUT, SIT, and CSS were assessed at baseline and follow-up at 4 and 12 weeks. An independent sample t-test was employed to compare study groups. A paired sample t-test and repeated measure ANOVA were used to compare the results across different time points. Following the intervention, a significant decrease in OSDI was observed in both groups (CEA 37.50 to 19.35, STD 39.31 to 14.42) ( $p < 0.05$ ). TBUT and SIT also significantly improved (increased) ( $p = 0.05$ ) over time. CSS improved solely in the CEA group at week 12 follow-up ( $p = 0.05$ ). The study findings suggest that CEA may serve as an alternative treatment for alleviating DED symptoms.

**Keywords:** *Dry Eye, Chinese Acupressure, Warm Compress*





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