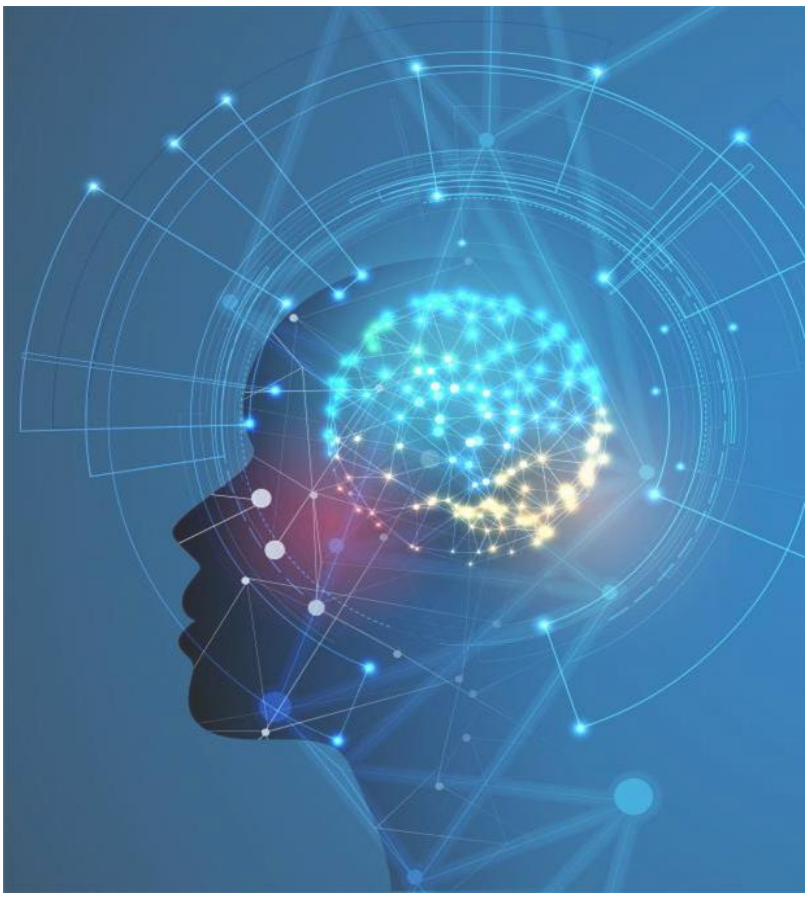
2022 Research Symposium:

Knowledge Shared = Knowledge^2



Book of Abstracts

23rd March 2022

Messages from The Senior Leadership Team (SLT)

It is with great pleasure that I welcome you to the 2022 Middlesex University Mauritius Research Symposium. The Research Symposium has been organised by the Research and Knowledge Transfer Committee and aims to be an annual platform to showcase the numerous studies done by our postgraduate students, staff and alumni across our different schools and departments. This platform provides a unique opportunity to showcase our research, to promote a research culture and to inspire our students to consider further studies. We are also hoping that through constructive feedback and discussions you will work with your supervisors to publish your work in credible academic journals.

At Middlesex University we are united by a shared purpose: creating knowledge and putting it into action. I am pleased to see that the programme builds on one of our key community principles of being collaborative:

We operate as a collaborative community, co-leading with students and co-creating across disciplines, professional services, sectors and cultures to create solutions to complex problems.

In this regard the theme of this symposium, "Knowledge Shared = Knowledge^2" could not be more appropriate. I hope this book of abstract will serve a memento of a great day shared with great people.

Prof. Mari Jansen Van Rensburg,
Campus Director,
Middlesex University Mauritius

To the participants and readers:

It gives me great pleasure to preface the combined abstracts for the Middlesex University Mauritius Research Symposium 2022. The range and scope of subjects to be discussed, and the participants at this Symposium, are an indication of the diversity and inclusivity that we have come to expect from our University, and which make us proud. I note, with excitement, the collaboration of staff and students in several presentation and this too is a reflection of the hand-in-hand mentoring relationship that makes this university a special place for staff and students. I look forward to more opportunities like this for us to showcase our excellence and commitment to academic endeavour.

Dr. Lee Pheiffer,
Deputy Director Academic,
Middlesex University Mauritius

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Table of Contents

The Only Certainty is Uncertainty: The Future of Strategic Enrolment Management in HE in the Time of Covid

Lee Pheiffer

The world has been flipped on its orbit by the Covid-19 pandemic, and no less, Higher Education. The physical, social and economic disruption caused by this pandemic has affected every aspect of our lives with no *one* aspect taking precedence over others. Such effects have been seen at personal, regional, national and global levels, with varying levels. It is then not surprising that higher education enrolment trends will also be affected. The growth of transnational education and globalisation has also forced a new look at enrolment management, and some researchers have argued that the pandemic has only exacerbated a disruptive trend that was already evident before Covid-19.

While only a brief summary can be provided of large- and small-scale effects of the pandemic, this paper focusses on the disruptive effect that the pandemic has had on Higher Education and, in particular, strategic enrolment management. Enrolment management is a dynamic process whereby environmental factors and data trends are considered, in an attempt to graduate the optimal number of students who are employable. Enrolment planning becomes *strategic* when it becomes integrated into all other processes, functions and operations of the institution and it becomes an institutional responsibility (Wilkinson, RB et al. 2007. *A practical guide to strategic enrollment planning in Higher Education*.)

In the past, enrolment planning was one of the important strategic planning mechanisms available to higher education to steer the future of institutions, with some measure of predictability and reliability. Such planning was used by institutions, with varied success, to set targets for student recruitment, open and close programmes and plan financially for the years ahead, aligned to the institution's mission and vision.

This paper looks at some of the models of Strategic Enrolment Management (SEM) and at the generally agreed to principles of SEM, holding these to the mirror of reliability in the light of Covid-19 pandemic. Is enrolment planning in the time of the Covid-19 pandemic still a valid and reliable mechanism for determining and planning for the future of institutions in a sector that sees increasing pressures on recruitment strategies?

The paper draws on some of the key thinking that is taking place about SEM, and by using some publicly available data on current trends, it attempts to provide some tentative views about the future of enrolment planning while further data mining and triangulation will be conducted in the next phase of the research. One of the key preliminary findings of the research at this early stage, is that enrolment management is needed - now more than ever. However, current models may need to be revised to meet the dynamic needs of a pandemic-driven environment.

An Experimental Investigation of the Impact of Positive versus Negative Advertising Message Framing, Moderated by Gender, on Charity Donation: a Study in the Context of Anti-domestic Violence Campaign in Mauritius

Denisha Seedoyal-Seereekissoon

Purpose of research: The increasing number of charities (Charity Commission, 2019; National Center for Charitable Statistics, 2020; Statista, 2021) has resulted in rise of competition for charity funds. The situation worsened for charities fighting against causes like domestic violence (Immordino et al., 2020; Taub and Bradley, 2020). Despite the struggle for funds, recent studies (El-Khoury and Shafer, 2016; Shortland and Palasinski, 2019) focused on how advertising campaigns impacted on other pro-social behaviours (i.e calling a helpline; behaviour change) instead of generating donation. Moreover, within the sphere of social advertisements, research (Chung and Lee, 2019; Muralidharan et al., 2020) demonstrated that the debate, about which type of message framing (i.e. negative versus positive emotional appeal) is more effective on willingness to donate, is ongoing. Amid negative appeals, disgust is relatively new and under-researched but proved useful in generating empathy and recruiting volunteers (Allred and Amos, 2018; Hamerman and Schneider, 2018). However, it is unclear whether using disgust will be effective on donation.

Within positive message framing, recent studies (Homer, 2021; Muralidharan et al, 2020) demonstrated that hope is efficient in fostering pro-social behaviours. Interestingly, Hudson et al. (2019), also, noted that hope versus other emotional appeals (anger; guilt; solidarity; repulsion and pity) impacted favourably on intent to donate. However, to date, there is no evidence whether disgust is more effective than hope on donation and vice versa. The other aspect of this research is about the portrayal of male (versus) female victims in advertisements. As per the social role theory (Eagly and Crowley, 1986), men are portrayed as heroes or a more leading position (than women) in advertisements, and not often as victims although domestic violence is an issue that can affect both men and women. To date, the impact of male (versus female) victims on intent to donate is missing from literature. The portrayal of victims, based on gender, can influence the relationship between the message framing and donation. Therefore, the aim of this study is to determine the impact(s) of using a positive (i.e. hope) versus a negative message framing (i.e. disgust), moderated by gender, on actual donation behaviours, in the context of anti-domestic violence campaign.

Methodology: The independent variable of this study is positive (i.e. hope) versus negative (i.e. disgust) message framing. The dependent variable is actual donation behaviour. The independent and dependent variables are moderated by gender. An experimental design will be conducted to measure the cause-and-effect factor. Participants will be exposed to different types of advertisements on a fictive website. Each advertisement will lead to a short survey and donation button. The experiment will comprise of a 2 (hope versus disgust) x2 (male versus female victim) within subject factorial design.

Expected findings/ contribution: This research is expected to bring light to the ongoing debate of effectiveness of negative versus positive appeals on pro-social behaviours (i.e. donation). Furthermore, this study is expected to influence charities who are sensitising against social causes like domestic violence in improving their communication appeals and, thus, gathering more donations.

Keywords: Message framing; Donation; Charitable Advertising

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Towards Engineering Higher Quality Intelligent Environments

Aditya Santokhee, Juan Carlos Augusto and Lindsey Brodie

Engineering quality intelligent environments is inherently challenging due to lack of appropriate methodologies. The problem is further exacerbated due to:

- Lack of guidance regarding tracking and measuring of quality during the development process
- No quality model to assess quality of intelligent environments
- Separation of the quality characteristics from functional requirements
- Few empirical research studies exist focusing on quality aspects for IEs.

This study presents a methodology, UCIEDP2, to define, measure and monitor quality aspects for intelligent environments during their development. The User Centered Intelligent Environment Development Process was enhanced by introducing new quality influenced activities to each of its three core development stages. Quality characteristics, and measures derived from the ISO/IEC 25000 family of standards are specified for every functional requirement. A quality-in-use model based on 9 core design principles is also presented. The model is derived from the generic ISO/IEC 25010 quality-in-use model. We provide validity of UCIEDP2 from examples taken from a multiple case study. We discuss how quality could be monitored during development by using an impact estimation table.

We observe that although more time and effort are required to apply the methodology, there is a reduction in the amount of rework post development. The vision of the project sponsors is translated to measurable quality characteristics which help developers assess the suitability of deliverables during development. Finally, stakeholders are involved during the entire process, and this ensures that the systems deliver the best value. Our current efforts are in applying the methodology to more industrial projects.

Keywords: Multiple case study, intelligent environments, systems development process, ISO/IEC 25000 quality standards, ISO/IEC 25010 quality-in-use model

Investigating Attentional Bias to COVID-19 related Stimuli in Healthy Undergraduate Students in Mauritius

Prerna Bholah, Jenny Liow Yan Man, Saphia Arbeena Beekawoo and Nazaahah Noor Oozeer

Background: The COVID-19 pandemic is associated with various restrictions, fear, and uncertainty, resulting in a rise in anxiety worldwide. This increase in anxiety has been found to further worsen existing mental health issues in both healthy and clinical populations. Studies on attentional biases have shown that anxiety is associated with hypervigilance towards negative stimuli. With the general rise in anxiety due to the pandemic, it is important to understand whether individuals are demonstrating attentional biases towards COVID-19 related stimuli and the underlying mechanism to improve mental healthcare policies and interventions.

Purpose of the Research: This study aims to assess the association between COVID-19 related stimuli and attentional bias in healthy undergraduate students at Middlesex University Mauritius as young adults have been found to be more vulnerable due to the uncertainty surrounding their future. This study will investigate whether (a) undergraduate students are more likely to demonstrate an attentional bias towards COVID-19 stimuli than neutral stimuli, (b) anxious individuals are more likely to demonstrate an attentional bias than non-anxious individuals, and (c) anxious individuals are more likely to demonstrate an attentional bias towards COVID-19 related stimuli compared to non-anxious individuals.

Methodology: A pilot study will first be conducted to identify words that are most associated with COVID-19 in Mauritius. For the main study, a dot-probe task will be used to assess attentional bias and the participants` anxiety levels will be measured using the Coronavirus Anxiety Scale (CAS) questionnaire. The design will be a 2 (lexical stimuli type: COVID-19 related, neutral) x 2 (anxiety levels: anxious, non-anxious) x 2 (probe position: congruent, incongruent) mixed factorial design.

Keywords: COVID-19; attentional bias; anxiety

Impact of International Collaboration on ICT Policy and State Practices in Mauritius

Thomas Robertson

Mauritius is famous in Africa and throughout the world for its emerging information and communication technology (ICT) industry and well-established digital landscape. Mauritian digitization and innovation are the results of government incentives for development. Such development plans resulted in collaboration between the public and private sectors of Mauritius and those of India, China, and Estonia, among other countries. My research assesses the international relations dynamics involved in Mauritian ICT development and explores the impact of international collaboration on the Mauritian state's domestic and foreign objectives concerning ICT.

This research seeks to add to the scholarly discourse of Mauritian foreign relations and ICT policy in Mauritius. Existing academic literature assessing ICT development in Mauritius through the lens of international relations is limited, especially literature that discusses ICT policy in Mauritius. ICT is also a major subject in international relations and global politics. As an emerging force in the ICT sector, research focusing on Mauritius is necessary as it is an understudied country within international relations discourse. This research also adds to the international relations discourse of digital development and ICT policy across Africa as a whole.

My methodology is centered around a literature review of scholarly articles and government publications relating to the development of the Mauritian ICT sector and Mauritian foreign relations. This review allows me to explore two defining themes of the international dynamics of Mauritian ICT: the legal framework alignment of Mauritian ICT laws to follow partner country practices, and the expansion of technology usage to combat crime. This research is part of a larger project I am conducting as a student researcher on how ICT governance can function as a foreign policy strategy for small island states.

Through this research, I find that ICT governance is influenced in part by existing frameworks in partner countries like India. I also find that international ICT collaboration facilitated the Mauritian state's technological approach towards fighting both traditional and online crimes. I contend that international collaboration in the development of ICT in Mauritius serves as a model for how Mauritius collaborates to foster ICT development and governance with other countries in Africa.

Keywords: Mauritius ICT; Mauritius foreign relations; technology diplomacy

Performance Appraisal and Efficiency in the Primary Education Sector in Mauritius

Nawsheen Dullull and B. K. Ashley Hoolash

Research Overview: This research examines the views on the validity of the current performance appraisal exercise as an effective tool to measure educators' efficiency in the public primary education sector in Mauritius.

Purpose of the research: Performance Management System (PMS) has emerged into a crucial feature of Human Resource Management. There has been a wide range of research done on performance management and appraisal all over the world, however, there appears to be a scarcity of research conducted in the Mauritian context on how performance management and appraisal might assist educators to enhance their efficiency. The Pay Research Bureau (PRB) Report (2013) revealed that the Bureau initiated a substantial poll on the application of PMS within Ministries to assess the effectiveness of its deployment throughout all public institutions which exposed that only 23% of the institutions responded that they were capable to implement the PMS as a foundation for their training or promotion strategies. This research is being carried out a decade after the poll as there have been several changes pertaining to the outbreak of the Covid-19 pandemic where the Key Tasks of educators have undergone changes yet still the Key Result Areas are the same in the Performance Appraisal Form.

Methodology/Design: A mixed method for data collection has been privileged as part of a Master's dissertation. Qualitative as well as quantitative data have been collected from interviews with appraisers and survey among appraisees respectively as both groups (appraisers and appraisees) cannot exist without the other; the level of interaction being perennial between them. The data from both groups is analyzed concurrently in one single investigation to target the loopholes in the current performance appraisal exercise. Thematic analysis is carried out from the interviews and interpreted in NVivo software. Survey results are analyzed using SPSS software.

Key Findings: It is shown from the research that the Performance Appraisal exercise has a significantly strong influence on the appraisees' who hold the exercise at a relatively high level to obtain their yearly increment. However, appraisees have also agreed to review and/or add some procedures/elements to the appraisal exercise; they are in favor of putting the Performance Related Pay scheme to increase their motivation and thus efficiency. This study has further demonstrated the appraisers' point of view as well on the validity and reliability of the Performance Appraisal exercise which is to a great extent on the negative side. The appraisers have a rather low esteem of the PMS in the education sector to the extent that they have rated it only as an eyewash exercise. The research shows there is a misalignment between appraisers and appraisees as per the appraisal exercise. Therefore, it becomes essential to bring forth some recommendations for appraisers and appraisees to be on the same platform to be able to carry out the exercise efficiently.

Keywords: Performance Management; Performance Appraisal; Educators' Efficiency

Predictors and Inhibitors of COVID-19 Contact Tracing Application Adoption

Adesola Olaegbe and Zia Lallmahomed

Overview of Research: In late December 2019, there was an unforeseen outbreak of Coronavirus (COVID-19), which resulted in a global pandemic that claimed millions of lives. Due to the virus's rapid spread, governments have imposed measures such as lockdowns, self-isolation, and social distancing, resulting in a global economic crisis. The full impact of COVID-19 on the world's economic and social sectors is still unknown. Take, for example, the tourist industry, which has been severely impacted by the epidemic. To allow individuals to travel freely and the economy to recover, government officials must be able to swiftly detect potential COVID-19 situations and track prospective encounters. There are numerous methods for doing contact tracing, one of them is to use contact tracking application. COVID-19 contact tracing application allows for the tracking of persons who come into touch with people who have COVID-19, no matter where they are. Despite the fact that numerous countries have adopted contact tracking applications for COVID-19 response, there is still inadequate data to assess the effectiveness. There are societal issues to adopting contact tracing application such as invasion of privacy, and incorrect medical advice based on self-reported symptoms.

Purpose of Research: The purpose of the research is to study the possible predictors and inhibitors that affects individuals' attitude towards adopting COVID-19 contact tracing application. It especially intends to investigate their perspectives on contact tracing applications; particularly, whether they are favourable to them or not and, finally, whether they intended to use a contact tracing application if one became available in Nigeria.

Research Methodology: A cross-sectional survey was carried out using a non-probability sampling technique. Online questionnaires were sent via social media and email, with a total of 145 individuals taking part in the study. Participants' personal information was not collected, and their permission were requested prior to taking part in the study. The data collected were analysed using Partial Least Squares (PLS) utilizing the SmartPLS-3 software to test the hypothesis generated by the research model presented in the study. The research model for this research was developed based on previous adoption theories by integrating Technology Acceptance Model (TAM) and Technology Readiness (TR).

Key Findings: The results gotten from the data collection and analysis revealed that seven of the presented hypotheses were supported and proved beneficial in predicting the intents of persons who would utilize the adopting COVID-19 contact tracing application, while four of the hypotheses were not supported. According to the research model which was adopted for the research model used of this study, it showed that perceived ease of use was driven by two determinants: innovativeness and discomfort, while perceived usefulness was driven by innovativeness and security.

Keywords: Contact Tracing Application, Coronavirus (COVID-19), Technology Adoption

New Insights on Farm-based Carbon Footprint Calculators

Rufaida Auliar, Girish Bekaroo, Aditya Santokhee and Chandradeo Bokhoree

Through farming activities, a significant amount of greenhouse gases is emitted and contribute to climate change [1]. To reduce these adverse impacts on the environment, farmers must obtain accurate insights on emissions from their activities for taking remedial actions. Insights on carbon emissions can be obtained through carbon footprint calculators. Though, these tools are freely available online, limited work has been done to analyse and compare these applications. Taking cognizance of this gap, this paper analyses key aspects of existing farming-based carbon calculators, notably their scope, calculation method employed, and consistency of results provided.

To achieve the purpose of this paper and to compare existing farm-based carbon footprint calculators, research was carried out, identifying calculators using Google as primary engine. Initial search was effected using keywords and out of an initial pool of 16 calculators identified, results were narrowed to select calculators that can potentially estimate carbon footprint for both crops and livestock without country's specificity restrictions. As such, only three calculators were found relevant – Farm Carbon Cutting Toolkit (FCCT) [2], Cool Farm Tool [3] and Farming Enterprise Greenhouse Gas Emissions Calculator [4]. For comparing the selected calculators, the framework in previous related studies was adapted due to their relevance in comparing carbon footprint calculators and their adoption was found deriving insightful findings that could potentially motivate policy reforms [5].

Results show that significant enhancements are needed to ensure that such tools provide reliable results to users. Firstly, categories used in such calculators and inputs could be better standardised and regulated to ensure correct parameters are provided to farmers in the calculation process. In addition, conversion tools could be included to ease change of values from one metric to another. Given that two out of the three calculators provide no information about calculation method adopted, reliability of results by certain calculators become questionable. Lack of information makes it unclear about formulae being used, emission factors utilized, and conversion factors involved. As such, farm-based carbon calculators are encouraged to provide information on calculation methods to ensure transparency, while providing feedback towards improving the tools.

Moreover, inconsistent results for same profiles were noted; making accuracy of such calculators questionable. As such, it becomes essential to implement measures towards enhancing consistency and reliability of results provided by such tools. However, none of the calculators studied were mobile-based applications; they were web-based; requiring use of a browser. Also, selected calculators enable farmers to have yearly carbon estimates from their farming activities; being a limitation to farmers who need to calculate their estimates on a monthly basis. This allows farmers to have a better overview on their carbon footprints temporally, thus promoting various practices in reducing those footprints for the coming month, towards better management of GHG emissions. Following analysis of three calculators, results showed varied categorisation of calculation parameters, granularity of inputs, lack of

transparency and some inconsistent results. The limitations identified in this study provide avenues for further enhancement of these tools by the research community and regulatory bodies.

Keywords: Greenhouse Gas; Carbon Footprint; Calculators

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Application Of Artificial Intelligence and Machine Learning in the Detection and Classification of Covid-19 Variants

Chitisha Gunnoo

The severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2) infection caused the novel coronavirus virus (COVID-19) to emerge in late 2019 [1]. It has been spreading globally since late 2019, resulting in a pandemic. COVID-19 transmission is reliant on close inter-individual contact and the transmission of breath droplets. Not just for health systems, but also for policymakers, predicting the rate of COVID-19 spread and estimating its trajectory is crucial. In fact, to suggest new tactics and analyze the efficiency of imposed policies, policymakers rely on predictions made by prediction models. Because of the disorder's nonlinear and complicated character [2] artificial intelligence technologies are a good alternative to standard epidemic models for predicting its spread. Traditional epidemic models, such as Susceptible-Exposed-Infectious-Recovery, have been used to forecast epidemic course [3], but these methods have some drawbacks.

To anticipate the progress of the COVID-19 outbreak, machine learning approaches often use data sequences retrieved over time as inputs. COVID-19 dissemination has been predicted using a variety of techniques. The Long Short-Term Memory (LSTM) model is one of the tactics used. For example, the Multilayer Perceptron (MLP) has been used to represent COVID-19 spread. The maximum number of people affected by COVID-19, the highest number of people who recovered, and the highest number of mortalities per site in each time division have all been predicted using this method [4].

The Natural language processing (NLP) module of the LSTM was utilized to analyze the infection frequency and improve the model's predictive accuracy [5]. By offering the constant error carousel unit, LSTM may effectively improve gradient explosion and gradient disappearance during the training process [5].

Based on the importance of machine and deep learning approaches in predicting the spread of COVID-19, we analyzed research that employed these tactics to estimate the number of new cases and variants of COVID-19 in the current study. "What are the uses of machine learning systems and their performances in the prediction of COVID-19 everyday new cases and the increasing number of mutations?" was the research question.

To address the methodology of our research, the rules and checklist for the PRISMA Scoping Review were used. 2018 saw the release of the PRISMA extension for scoping reviews. Scoping reviews are used to evaluate the scope of literature on a topic and synthesize evidence. Scope reviews are used to assess whether a systematic review of the literature is necessary, among other things. We further made use of several artificial intelligence strategies have been used for prediction of COVID-19 spread using different models, ANFIS and ARIMA.

Expected Findings: Al-Qanes et al. [7] demonstrated that the MPA-ANFIS technique outperforms previously proposed prediction models in terms of RMSE, MAE, MAPE, and R2 [6]. The proposed FPASSA-ANFIS model was then evaluated using official data from the WHO website. ARIMA is a generalization of an autoregressive moving average (ARMA) model that is used to fit time series data in order to better understand the data or anticipate future points in the series, and was used by Alzahrani et al. [11] to predict the predicted daily levels of COVID-19 people in Saudi Arabia.The prediction is to find that ARIMA outperformed Autoregressive Model, Moving Average, and a combination of ARMA and ARIMA.

Keywords: Machine learning;COVID-19;Artificial Intelligence

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A Browser Extension for Real Time Social Engineering Detection on Social Media, Using Machine Learning.

Chiamaka Ann Marie Ajufo and Girish Bekaroo

Overview of Research: Social engineering (SE) attacks have become one of the biggest cyberthreats during recent years and will only continue to evolve as more years progress (Frumento, 2018). Often referred to as "human hacking", SE is also the preferred method through which cybercriminals achieve their other malicious goals such as theft of sensitive information, as it offers a higher success rate with little to no expertise in comparison to, for instance, technical hacking tactics which require years to master (Fischer, 2016). SE is usually conducted via email or phone calls; however, social engineers have begun to expand to social networking sites (SNSs) to conduct SE attacks due to the rapid information dissemination and lack of SE detection mechanisms provided on these platforms (Wilcox & Bhattacharya, 2015). With the pervasiveness of SE attacks on SNSs increasing, many tools have been created to address this issue; however, these tools possess major limitations.

In this study, a machine learning (ML) enabled tool was created to automatically detect SE in SNSs, in real time. A Random Forest algorithm was used to create an ML classification model, trained with 6 features which predicted if an SNS post could contain SE or not, classifying posts as either safe or unsafe. A web browser extension and API (which hosts the ML model) were created to apply this model to live posts from SNS websites. The extension extracts text from each post and sends it to the API for prediction as a POST request, the API then responds with either safe or unsafe, and based on this prediction, a green or red icon is appended to each post, indicating its status.

Methods & Findings: Development of the tool was done in three main stages. Stage one was primarily focused on the data. In this stage, a dataset (obtained from Kaggle), was pre-processed, by removing the irrelevant columns and populating null values, after which 6 features were extracted, including number of URLs present, presence of trigger words, total number of interactions, etc. The second stage involved creating and training the ML model to make classifications on whether a post was safe or not, based on the features specified. The final stage was the creation of the web browser extension and the API with which the ML model was integrated, thus completing the creation of the prototype.

To test the ML model, it was split using train-test-split, 80% for training and 20% for testing, and four performance metrics (precision, recall, accuracy and f1-score) were used to determine the performance and effectiveness of the proposed tool. The following table contains the results of these metrics, showing that the model attained high values in all metrics in classifying both safe and unsafe posts.

Metric	**RF Algorithm Score**
Recall (safe)	97.47%
Recall (unsafe)	97.17%
Precision (safe)	97.31%
Precision (unsafe)	97.34%
F1-score (safe)	97.39%
F1-score (unsafe)	97.25%
Accuracy	97.33%

After these results were gotten, the model was then tested on Twitter posts, being made in real time by real people. On demonstrating the tool on real-world tweets, the model was able to successfully differentiate safe from unsafe tweets (indicating its status with a red or green icon within an average of 0.38 seconds of loading the webpage). Most tweets classified as safe, on inspection, seemed to be coming from authentic users and did not contain any content usually indicative of SE (trigger words, use of hashtags/URLs, etc.). However, it was noticed that some tweets which appeared to be safe (not containing any SE indicators) were classified as unsafe when such tweets had a high number of interactions. This was a direct result of the dataset used in the ML model creation, as almost every unsafe post had a high number of interactions. Moreover, although this prototype produced predictions which were somewhat biased, this was a direct result of the training dataset used. That being said, it was still able to detect SE on SNSs in real time, with accurate results which could be further strengthened with training data of higher quality.

Keywords: Social Engineering; Social Networking Sites; Machine Learning

Enhancing Student Support with a Voice User Interface System: User Experience Insights

Ouwesh Seeroo and Girish Bekaroo

Student assistance is critical within higher education in order to improve student learning experiences and academic achievement. There are various challenges that computer science students confront during their university studies, including academic writing and programming, where many students find it difficult and lose interest in the topic. With the substantial advancement of technology in recent years to bridge the gap between human-computer interaction and the real world, Voice User Interfaces (VUI) have the potential to be employed as a solution within student support systems.

This study explores using a VUI system that can provide student assistance and derive user experience insights. A VUI prototype was designed and developed as part of this study to assist Computer Science students in their studies by giving academic guidance, particularly in academic writing, referencing, and programming. The design of the prototype was carried out by using VUI design principles. The prototype was developed using the Web Speech API and Bootstrap for the user interface. Regular expressions were used to filter keywords, and a dictionary of responses was used to provide alternative replies to the user.

The User Experience Questionnaire (UEQ) framework was used to collect data as it allows rapid assessment of the user experience by capturing details about their feelings and impressions that happen when they are using a product [1]. The population for the evaluation involved 22 Computer Science students, which satisfies the minimum requirement for such studies. The evaluation included three constructs: response behavior, response quality, and comprehensibility. Additionally, observational evaluations were also carried out to see the expression of the user when using the application. Comprehensibility obtained the highest score among the constructs. The response quality mean score was above average and showed potential for such a system to be implemented in universities where there are services that involved student support.

However, the system showed certain limitations, for instance, a considerate number of users had issues getting started with the application, although there was a guide with instructions and commands available. An interactive system could be introduced to show interaction on how to use the system to navigate [2]. The results indicated that the system response was artificial as the system had 3 variations of response. The speech utterance could be improved by including more alternatives of reply. Furthermore, more accents could be included so that the user can choose one that they are comfortable with allowing a more natural conversation. According to users, the system did not understand complex commands, and its level of intelligence was found to be average. AI techniques could be introduced such as machine learning, deep learning, and reinforcement learning techniques could be utilized to learn from the users and update the dictionary of commands when required. Additionally, this could improve speech processing in the front end by providing better suggestions when the speech recognition fails to understand a word, a closer match could be suggested by the system.

Keywords: Voice User Interface; Student Support; Academic Support; Voice Interaction; User Experience.

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COVID-19 in Mauritius: Impacts of Age and Chronic Illness on Anxiety and Distress

Jenny Liow Yan Man, Sameeha Monaff and Prerna Bholah

Background: Older adults are psychologically twice as vulnerable to COVID-19 due to their age and the presence of co-morbidities. Mauritius has an ageing population with a high prevalence of chronic illnesses, which significantly impacts its economy and healthcare system. Therefore, identifying the most vulnerable populations in Mauritius and understanding the pandemic`s psychological impacts may help to improve healthcare policies and interventions.

Purpose of the Research: The current study aimed to investigate the effects of age and health status on anxiety and distress in Mauritius during the first national lockdown in March-May 2020. Methodology: Of the initial 843 participants recruited from the general public through an online survey, only 709 were analysed. A cross-sectional design was used with two independent variables were age (young and old) and health status (presence of chronic illness and absence of chronic illness). The two dependent variables, anxiety and psychological distress, were measured with the Generalised Anxiety Disorder Scale-7 and the Impact of Event Scale-Revised questionnaires, respectively.

Results: Multiple linear regression analyses indicated that age and health status did not significantly predict anxiety and psychological distress. Bivariate analyses on age and health status yielded only a significant main effect of age with younger adults reporting higher levels of anxiety and distress.

Implications: Young adults in Mauritius were more psychologically vulnerable to the pandemic-related changes, highlighting the potential effects of the COVID-19 restrictions on this population`s psychological well-being. These findings indicate that young adults may require more support during stressful events.

Keywords: COVID-19; age; health status

Machine Learning in Payments Industry

Chitisha Gunnoo and Leenshya Gunnoo

The coronavirus pandemic has ushered in a new era of digital payments, with people who used to mail cheques and make purchases in person instead paying their bills and shopping online. While the economy is being shaken by the coronavirus, certain AI businesses in the payments industry will thrive while others will fail. All are rapidly shifting their concentration to eCommerce, assuming it was not already their primary focus. In this increasingly digital environment, financial institutions will be seeking for AI businesses that can deliver faster, easier, and more secure payments so that they may take on more business with less risk.

Mckinsey (2016) explains that big data and advanced analytics, including machine learning, will become more widely available, affecting practically every sector of the economy, including financial services (exhibit). Machine learning is particularly useful when dealing with huge, dynamic data sets, such as those used to track consumer behavior. It can identify tiny alterations in the underlying data as habits change and adjust algorithms accordingly. Machine learning may even detect data anomalies and treat them as directed, enhancing prediction greatly. Because of its unique features, it is suitable for a wide range of payment applications.

The wealth of available data and improved, and more affordable, processing capacity are enabling growing AI usage in finance, in sectors such as asset management, algorithmic trading, credit underwriting, and blockchain-based financial services. AI is embedded in products/services across various industries (e.g., healthcare, automobiles, consumer products, internet of things (IoT)) and is increasingly being deployed by financial services providers across industries within the financial sector: in retail and corporate banking (tailored products, chat boxes for client service, credit underwriting and scoring, credit loss forecasting, AML, fraud monitoring and detection, customer service); asset management (robo-advisory services); asset management (robo-advisory services); asset (robo-advice, claims management). The official sector is also using AI in RegTech and SupTech applications (for example, natural language processing (NLP) and compliance processes). As the use of big data to deploy AI and machine learning grows in relevance ,the potential hazards arising from its application in financial services are becoming more worrying, and policymakers may need to pay more attention. A number of national policymakers and international fora have already begun to debate how regulators and supervisors can ensure that the risks associated with the use of AI in financial services are mitigated, as well as what the best approach to AI deployment in financial services would be from a policymaker's perspective.

The aims of this research and analysis are twofold: first, to give analysis to educate policymakers and IOs' ongoing debate, and second, to study challenges that arise at the junction of AI, finance, and policy that are mostly unexplored. The latter entails examining how AI, machine learning, and big data affect specific aspects of financial market activity (such as asset management, algorithmic trading, credit underwriting, and blockchain-based financial products) and their business models, as well as how these technologies interact with existing risks (such as liquidity, volatility, convergence). Indeed the outcomes of this study will provide focus on industry challenges, potentially disruptive forces, shifting payment habits, and the

prospects for banks, technology companies, telecom companies, fintech companies, and others integrating AI and data as futuristic tool in a quickly changing environment.

Keyword: Digital payment, COVID, Machine learning

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Application of Augmented Reality in Aviation: Improving Engagement of Cabin Crew during Emergency Procedures Training

Tanveer Gangabissoon, Girish Bekaroo and Waseemah Moedeen

The main duty of the cabin crew is to ensure the safety of all passengers onboard and are crucial during emergency situations. It is mandatory for the cabin crew to attend the annual Emergency Procedures Training (EPT) to be able to operate as cabin crew regardless of the seniority. Despite the high importance, this training can be long and bulky leading to boredom and lack of engagement, hence jeopardizing the importance of in-flight safety procedures.

Although Augmented Reality (AR) can potentially address this issue while enhancing engagement and learning retention, limited work has been undertaken to apply this technology to EPT. As such, this paper delves whether augmented reality can effectively improve user engagement during emergency procedures training in the context of aviation. In this endeavor, an AR-based application named AvGeek AR was developed and is presented in this study. The features of the applications were designed to address the problems related to engagement faced during EPT.

The Positive Engagement Evaluation Method (PEEM) was used to assess engagement among the 45 cabin-crew of the national carrier. The PEEM matrix is based on psychological components, psychological flow theory, and several neurological concepts in order to evaluate the engagement and immersion. Hence it was deemed appropriate to utilize this particular model due to its relevance and popularity in assessing user engagement. effectiveness of interactive and immersive technologies specific to AR based on past studies. The matrix is represented by 8 attributes namely Goals, Attention, Content, Concentration, Identity, Interaction, Collaboration and Satisfaction. Positive engagement is then determined from the net sum of all the 8 scores obtained.

From the PEEM matrix, the positive engagement score obtained was 10.58 and mean scores from the questionnaire ranged from 3 to 4.7. Hence, it can be deduced that the app has evoked positive engagement among the users whereby satisfying the 8 driving forces of engagement although a few limitations were identified. This highlights that Augmented Reality has the potential to enhance the motivation and engagement of users during the emergency procedures training. Furthermore, it can be deduced that using such AR-based tool may improve learning effectiveness and training performance during emergency events hence alleviating the jeopardization of safety procedures in the aviation context required by the cabin crew.

Keywords: Augmented Reality; Engagement; Mobile Application.

Student Feedback on LET Feedback: A Semester Evaluation of the LET Consultation Service at Middlesex University Mauritius

Gavina Seeam and Nusreen Rozah

The provision of Academic support is of undeniable importance in Higher Education. At Middlesex University Mauritius, the Learning Enhancement Team (LET) is established as an independent Academic support unit to assist students in developing academic study skills. Among the services of workshop delivery, written and video resources; the consultation service provision is prominent. Students can request assistance from the LET Team (LET Head, 15 Student Learning Assistants) either through a live (face-to-face meeting – physical or online) or remote (email communication) interaction mode. An evaluation of the consultation service is significant to improve its quality (Agrawal, 2004) and to create further awareness about its effectiveness as 'useful pedagogic tool' (Price et al., 2017).

An online survey was produced and shared with students through the Student Voice Leaders' (SVLs) WhatsApp group on 06th January 2022. The online survey was an appropriate method to outsource insights (Gakhal and Wilson, 2019) into the different aspects of the consultation service and sharing the link through the watsapp group was most convenient (Cetinkaya, 2017) for generating prompt engagement. The data from the survey was collated on 08th January 2022. A total number of 42 students participated. From the 9 questions listed, 7 were close-ended and 2 were open-ended. The participants from the survey present a 'snowball' representation (n=31) which leads to the possibility of varied analyses to identify areas of discussion under the service (Valdez and Kaplan, 1999 quoted in Cohen and Arieli, 2011).

The survey highlights the different aspects of academic support provided through the consultation service with students resorting mostly to assistance on their assignment drafts (41.9%). It is noted that half of the participants (50%) rated the service as very helpful. 88% of respondents who have perused the consultation service would like to request support from LET again and 87.5% vouched for the service to have impacted positively on their overall student experience. 9.4% students are dissatisfied with the reason attributed to no response from the team. As a matter of fact, 84 students perused the consultation service with some more than once amounting to the 114 recorded consultations for the first semester. 15 out of the 84 students responded to the survey and it is found that a number of 16 students who responded having used the service in the survey were not logged in the LET consultation records. This likely points to omissions in consultation records and the need to be thorough with record-keeping.

The positive results from the survey resonates with the 'highly positive student perceptions of consultation services' (Nathan, 2021). Students experience the benefits of peer mentorship (Asgari and Carter, 2014) which help them perform better academically (Tsang, 2020; Falchikov and Blythman, 2002; Price et al., 2017). The survey results posit the consultation service as essentially helpful and highlights the significance of reflective and analytical review of its practice. Therefore, the LET unit would aim at sustaining provision of the service while

focusing on promoting awareness of its success to the university community for a continued growth.

Keywords: Academic Support; Consultation Service; Peer-Mentorship

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Exploring the impact of social media platforms as a key marketing strategy to recruit Postgraduate Students at Middlesex University Mauritius

Allan Christopher Koi-Chin and Denisha Seedoyal-Seereekissoon

Purpose of research: Social media is a tool that is being used by universities to advertise their courses offered. It is considered the cheapest way to reach, attract and influence prospective student's applications compared to traditional media (Aiofi, Bellini and Pellegrini, 2021). Studies by Bamberget et al (2020), Singh (2019), and Reddy (2019) have demonstrated that the effectiveness of using social media marketing has influenced the application of international students.

However, there are limited studies have been carried out regarding the use of social media as a marketing strategy to recruit Postgraduate students. In this context, a cross sectional study has been carried out to investigate about the effectiveness of using social media platforms to recruit postgraduate students at Middlesex University Mauritius.

Methodology: In this context, a cross sectional study has been carried out to investigate about the effectiveness of using social media platforms to recruit postgraduate students at Middlesex University Mauritius. Quantitative data has been collected through a survey among 95 postgraduate students and qualitative data was analysed from an interview with a marketing and admission staff at Middlesex University Mauritius.

Key findings: Based on the findings of this study, it has been found that providing relevant and reliable information, by organizing virtual events and the sharing of photos and pictures are the strategies that have influenced the postgraduate student's application at Middlesex University Mauritius. It was analysed that Postgraduate students are more concern about the delivery of the course, the time the course will run and the certificate. The postgraduate students are more concerns to have a promotion at work. On the other side, for an undergraduate or international student they are concerns more about the facilities and activities offered by the university. Last but not least Facebook and YouTube have been considered as the most effective social media platforms for recruitment.

There are some limitations that have been encountered while conducting this study. Since there are limited studies that have been carried out on the use of social media platforms to recruit postgraduate students it is encouraged that more studies are carried out on the same theme. In addition, traditional media (newspaper, radio, television) still have a dominant place in our daily day life. It will be interesting to carry out a comparative study between traditional and social media to find out which one is more influential to attract postgraduate students at universities.

Keywords: postgraduate recruitment, social media marketing, social media platforms

Development of an Anomaly-based Intrusion Detection System using Multi-Level Perceptron in the Mauritius Metro Express System

Chitisha Gunnoo and Mrinal Sharma

Purpose of Research: The Mauritius Light Rapid Transit (LRT) Project, often known as the Metro Express, is a new light rail public transportation system in Mauritius that has been operational since September 2017. Because the rail system was brand new, it required a new access control system to safeguard and secure it. The Metro Express Project used the ACT Enterprise server V2.8.0.46, which is a multi-award-winning access control system that includes a smartphone app, a rule-mapping engine, video integration, and interaction with Vanderbilt's SPC intrusion detection system.

The challenge of managing network security for the company, not only necessitates new types of attacks, but it also necessitates the ability to cope with massive amounts of data. Any intrusion would be detected by the Intrusion Detection System (IDS), which would notify the administrator. This paper presents a model for creating a network intrusion detection system for the Mauritius Metro Express Network system, using a machine learning algorithm called decision tree. This system primarily identifies intrusions based on anomalies.

Methodology: The data for the proposed design is taken from the CCIDS 2018 dataset, which is freely available. The data's category characteristics are then encoded with a label encoder. Because any machine-learning-based algorithm cannot handle string data, the label encoder is employed to transform string data into numerical representation.

This information is then separated into training and testing categories. A Decision-Tree-Model is then built using the training data. A decision tree is a tree-like structure in which each leaf represents a potential conclusion. Because all of the data's characteristics aren't required for developing the model, RFE is used to pick the best ones. A total of 13 characteristics were chosen from a total of 83. Source IP, destination IP, flow bytes, and other features were chosen. This information is then separated into training and testing categories. A decision tree model is then built using the training data. Decision trees are supervised learning methods that use training data to develop a model and then test data based on that model. The decision tree employs a tree-like structure in which each leaf represents a potential conclusion; in this example, each leaf indicates the sort of assault or usual conduct (benign).

The training model processes the test data to identify whether it is benign or malicious, and if it resembles any attack, it returns the kind of attack.

Key Findings: Using the training data, classification models are created to classify the test data as malicious or benign. It is critical to assess the classifier's accuracy using future data rather than historical data. On test data, the classifier has a 99 percent accuracy rate. The True-Positive-Rate (TPR) of the suggested system is 99.9%, whereas the False-Positive-Rate (FPR) is 0.1 percent, according to its precision. In comparison to traditional systems that were modelled using the KDD-CUP-99 data set, the suggested model leverages the most recent data

set for training and test data. This work can be used as a foundation for any new method that uses the dataset CSE-CIC-IDS2018.

Improvements: Using big data analytics, the work can be extended to use the huge data accessible for assaults and intrusions.

Keyword: Intrusion Detection, Machine Learning, Decision Trees

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