Computing and Information Systems - Events

Report of Contributions

Contribution ID: **1** Type: **Abstract for Research Paper**

System Dynamic Model for Management of Lung Cancer Caseloads in Kenya Health System using Disease Pattern Analysis

Background
According to the WHO (2019), cancer causes more mortality than Malaria, TB and HIV combined globally. 70% of the global Cancer burden is in Low- and Middle-Income Countries (LMICs) (Joan, 2019) such as Kenya. In Kenya, as of the year 2019, cancer was rated the 3rd leading cause of death generally and second among non-communicable diseases. According to Max & Hannah (2018), cancer was rated at 7% of the overall mortality rate in Kenya.
Problem Statement
There is need to develop a System Dynamic Model for Management of Lung Cancer Caseload in Kenya for proper planning and preparedness by the government and stakeholders in providing appropriate healthcare to cancer patients.
In Kenya, many patients pay for their treatment out of pocket and those that may be in some form of insurance are generally not fully covered on cancer treatment costs. These costs result to an impoverishing effect to the affected families thereby leading to an estimated over 600,000 households being pushed into poverty each year.
Main Objective
To Control and Manage lung cancer caseload by determining and analysing its growth pattern using System Dynamic Model.
Specific Objectives
i.To investigate the causes of lung cancer caseloads in Kenyan health facilities
ii.To analyse the implication of lung cancer caseloads on the health outcomes in Kenyan Health facilities
iii.To investigate the role of ICT in managing lung cancer caseloads by Kenyan Health facilities
iv.To investigate the lung cancer caseloads patterns across Kenyan health system stream using pattern analysis Techniques
v.To design a system dynamics model involving health information security management.
vi.To propose a system dynamic model for managing lung cancer caseloads in Kenya's health system
Methodology
A mixture of Methodologies will be used for optimal results including:
i. Factor analysis method
ii. Pattern analysis
iii. Descriptive, Exploratory/Explanatory Methodologies
iv. Conceptual Modeling Methodology

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **2** Type: **Abstract for Research Paper**

Performance of Auto-regressive Integrated Moving Average Model (ARIMA) for Forecasting Daily Demand and Supply: A Case of Small & Medium Enterprises in Kenya

Demand and supply forecasting for small and medium enterprises (SMEs) in Kenya is crucial in ensuring that the SMEs stock the right quantities of products at the right time to increase sales and minimize losses through dead or slow-moving stock. This study modeled a forecasting model based on an auto-regressive integrated moving average (ARIMA) to forecast the daily demand and supply quantities for SMEs in Kenya. The ARIMA model was implemented in R as the main analytical tool and R-shiny as a presentation layer that allows SME owners and managers to interact with the model by uploading their sales and purchase data in a predefined comma-separated values file (CSV). The performance of the model was compared with that of the naïve model, seasonal naïve model, and the simple exponential smoothing model.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **3** Type: **Abstract for Research Paper**

Refining Location-Aided Routing (LAR) through Proactivity

One of the weaknesses in Location-Aided Routing (LAR) is the latency due to partial flooding of data packets throughout the ad hoc network during route discovery. Systematic literature review indicates that very little or no studies conducted to seek a solution to this routing weakness in LAR. This study proposes introduction of periodic updates of location information among the nodes as a solution to minimizing latency. Proactive-LAR (P-LAR) eliminates partial flooding, thus reducing latency while advancing routing performance of traditional LAR. As a research scope, this study uses Angle of Arrival (AoA) and the expected distance of nodes as the only location information details. Moreover, the simulation is limited to the initial expected zone of LAR. Simulation of the modified LAR algorithm indicates that inclusion of proactivity as an algorithmic aspect of LAR augments general data packets throughput, delay, packets delivery ratio while minimizing the number of packets dropped. The results suggest that proactive algorithmic element in LAR routing algorithm can potentially minimize partial flooding thus improving routing performance while minimizing routing overheads such as latency.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **4** Type: **Abstract for Research Paper**

TOWARDS MULTILINGUAL FEATURE ENGINEERING FOR SMS SPAM DETECTION

ABSTRACT
Billions of money is lost by mobile phone users every day due to SMS spam, a social engineering skill attempting to obtain sensitive information such as passwords, Personal identification numbers and other private data by masquerading as a trustworthy entity through Short message service. The design of efficient feature engineering techniques is the key to reducing these financial losses. Most machine learning classifiers solutions today produce less accurate predictions and are inefficient due to the dynamic nature of spamming. It is in this background that the study proposes an ensemble feature engineering techniques for SMS spam, that can be used for multilingual natural language processing, data training, validation and testing of a model. The contributors of data include the UCI database and local repositories that contain a mixture of English and Swahili messages. Machine learning and data mining experiments are conducted using the WEKA tool and the results and discussions are presented in the form of descriptive statistics. This novel approach recorded an overall satisfiable accuracy of 99%.
KEYWORDS: Algorithm, Detection, ensemble, Feature engineering, Machine learning, Sms.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **5** Type: **Abstract for Research Paper**

Automatic Detection of Coronavirus Disease (COVID-19) Using X-ray Images and Deep Convolutional Neural Networks

The 2019 novel coronavirus (COVID-19), originating from Wuhan China, has spread rapidly among people living in other countries, and is approaching approximately 12,245,417 cases worldwide according to the statistics of European Centre for Disease Prevention and Control (ECDP). There are a limited number of COVID-19 test kits available in hospitals due to the increasing cases daily. Therefore, it is necessary to implement an automatic detection system as a quick alternative diagnosis option to prevent COVID-19 spreading among people. Presently, COVID-19 has posed a serious threat to researchers, scientists, health professionals, and administrations around the globe from its detection to its treatment. The whole world is witnessing a lockdown like situation because of COVID-19 pandemic. Persistent efforts are being made by the researchers to obtain the possible solutions to control this pandemic in their respective areas. One of the most common and effective methods applied by the researchers is the use of CT-Scans and X-rays to analyze the images of lungs for COVID-19. However, it requires several radiology specialists and time to manually inspect each report which is one of the challenging tasks in a pandemic. In this paper, I have proposed a deep learning neural network-based method nCOVnet, an alternative fast screening method that can be used for detecting the COVID-19 by analyzing the X-rays of patients which will look for visual indicators found in the chest radiography imaging of COVID-19 patients, machine learning (ML) methods can play vital roles in identifying COVID-19 patients by visually analyzing their chest x-ray images. In this paper, a new ML-method proposed to classify the chest x-ray images into two classes, COVID-19 patient or non-COVID-19 person.

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Track Classification: Innovations Challenge Abstracts

Contribution ID: **6** Type: **Abstract for Research Paper**

ECOMMERCE THRIFT STORE WEBSITE

Nowadays it is easy to find thrift stores and thrift sales at any nook and corner in this world as fashion has become a great trend disregarding the age limit and gender. All thrift store owners and thrift vendors are relying on their customers who visit the stores and stalls to fulfill their own need for getting second hand items. This is seen in developed countries such as the United states ,United Kingdom and China. Therefore, it is important to provide those customers with the items they desire from their stalls or stores. From the other side, to make the thrifting experience better and to enhance the good names of the stores and the vendor's satisfaction also needs to be fulfilled. Not only that the income earns by selling the items to the customers and be able to monitor their reviews.

The website application is the solution to upgrade the manual method of business transaction between the thrift vendors and customers. Currently with the manual method of business transaction it is hard to book an item .It is also hard to keep record of sales and keep track of the inventory of the items in one's stall or store. It is hard for one to find an item they desire online as most online stores only sell brand new items .Some of the online sites that sell second hand items are not legit and end up stealing from a customer asking them to pay for a down payment and don't end up supplying the items stated. The available stores sell their items on social media platforms such as Facebook, Instagram and WhatsApp so if you have no prior knowledge of the people on the platforms then it is difficult to find items desired.

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Track Classification: Innovations Challenge Abstracts

Contribution ID: **7** Type: **Abstract for Research Paper**

Improving the Mechanic finding process using a web application that brings Car owners and mechanics together in a singular web application.

Driving in Kenya is one of the most hectic situations ever especially if you live in the city the number of vehicles ranging in shape, size, color and make, never ceases to amaze. Although all the vehicles are always in transition from time to time you come across a broken vehicle, with a triage stop requesting for mechanical help. The number of times we experience this is ridiculous high, quoting from my research 80% of motorist have had their vehicle breakdown as they were travelling to their destination.

Car's breaking down is a normal feat since they are machinery but like all machinery they need to be fixed and maintained this is fundamental to keep machinery up and working. The problem arises when first car owners start looking for a mechanic to fix their vehicle. Some call on their personal mechanic even when their vehicle has broken down in absurd location. Other source from the local mechanics without prior knowledge of their experience and work ethic. This sounds like a real problem and modelling from the real world provides the best way to get a solution.

I came up with an app that onboards car owners and mechanics together and uses a geolocation map that enables them to interact based on their immediate location so as to keep time and also promote the existing talent of mechanics in the local area. The web app can be accessed from a link online and also saves data on your phone so that when your offline both mechanic and driver can gain access to their data from their device.

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Track Classification: Innovations Challenge Abstracts

Contribution ID: **8** Type: **Abstract for Research Paper**

Stadium Ticketing System (SeTS)

The Stadium Ticketing System (SeTS) is an application system design proposal set to allow for modern day entry into stadiums providing a virtual stadium ticketing management system. In Kenya, there are several stadia namely the Moi International Sports Centre – Kasarani, Nyayo Stadium, City Stadium, Afraha Stadium, and Kenyatta Stadium among many other stadia that host football matches where for the longest time the entry verification mode into the stadium during match days has been through use of manual tickets. Unfortunately, the manual system has developed several problems over the years that have led to long queues, locking out of fans, the death of fans due to a stampede caused by a struggle to gain entry into stadiums, financial losses to clubs caused by untamable fraud amongst other problems. This project proposal is carried out with an aim of automating the manual ticket system and provides an online ticket booking and verification system that holds data ranging from ticketing information to financial and statistical information. In achieving this studies were carried out to collect data about the system and its requirements prior to actual design. The study entailed in-depth interviews; direct observation and a review of online sources to help in the design of the system. SeTS will greatly transform ticket management substantially benefiting clubs leading to financial growth and subsequently improving the fans match day experience. The system proposal provides fans with the capability of finding available match day fixtures, plan ahead by booking on time, reserving a match seat ensuring they never miss out and an automated verification at the gates allowing faster entry. The system maintains up to date information on matches, tickets booked and financial information.
Keywords: Stadium, Tickets, Fan, Match, Online, System

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Track Classification: Innovations Challenge Abstracts

Contribution ID: **9** Type: **Abstract for Research Paper**

microcontroller based overload detection and control model in vehicles

MICRO-CONTROLLER BASED MODEL FOR OVERLOAD DETECTION AND CONTROL IN VEHICLES
1.0 Background of the study.

Throughout the world, roads are shared by cars, buses, trucks, motorcycles, pedestrians, animals, taxis, and other travelers. Road traffic injuries cause 1.3 million deaths and up to 50 million injuries each year. One of the major causes of the accidents included overloading. Vehicles react differently when the maximum weights which they are designed to carry are exceeded and the consequences can be fatal. Overloading a vehicle is an illegal offence which occurs when a vehicle's maximum permissible weight limit is exceeded

1.1 Statement of the problem
Road accident is the least expected thing to happen to a road user, though they happen quite often. The most unfortunate thing is that we don't learn from our mistakes on road. Most of the road users are quite well aware of the general rules and safety measures while using roads but it is only the laxity on part of road users, which cause accidents and crashes. Main cause of accidents and crashes are due to human errors.

1.2 Objective.
The main objective of this study is to design and implement a micro-controller based model for overload detection and protection.
Specific objectives.
i. To investigate factors leading to overloading in vehicles.
ii. To design a model for overload detection and control in vehicles.
iii. To implement the model for overload detection and control in vehicles.
iv. To validate the implemented model for overload detection and control in vehicles.

1.3 Methodology.
i. Objective 1: Looking at the factors that lead to overloading in vehicles- Survey on literature -Explore existing models.
ii. Objective 2 and 3: Design science approach will be used.
iii. Objective 4: Proof of concept (POC) approach- This establishes whether software can actually be developed.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **10** Type: **Abstract for Research Paper**

Machine Learning-Based System to Predict Patient Complication for Emergency Medicine

This study is part of an ongoing Ph.D. thesis; the objective is to design a data science system to help in utilizing the limited medical resources by assigning priority of treatment. The system is designed to work on the emergency department to serve as a diagnostic intelligent system that uses machine learning models to check COVID-19, diabetes complications, and diabetes DKA, this system would enable physicians to take accurate and immediate decisions towards high-risk patient based on the priority level. Also, the proposed system is dynamic and can update it is models and learns from the data it creates automatically as the number of records increases over time, moreover, the system can be extended to diagnose more diseases and health conditions as needed.

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Track Classification: Artificial Intelligence in Health Workshop Abstracts

Contribution ID: **11** Type: **Abstract for Research Paper**

Real-Time Detection of Vehicle License Plate using Improved Faster R-CNN

Real-time identification of vehicle license plate has become more practical within the last decade in many applications such as; storage and retrieval of vehicular inflow records, automatic toll collection, parking fee payment, traffic monitoring, tracking of moving vehicles, recovery of stolen vehicles etc. A lot of researches have been carried out on license plate detection being the most important aspect of license plate recognition. In this paper, we present an improved Faster Region-based Convolutional Neural Networks (R-CNN) algorithm for detecting and extracting vehicle license characters. The technique engaged in this research focused on improving the creation quality of region proposals of the original Faster R-CNN technique. The performance of the proposed technique was evaluated using Mean Average Precision (MAP) obtained from all the precision-recall (PR) curves that were computed during model training. We also tested the proposed technique with 1000 dataset of vehicle plates from Nigeria and an overall accuracy of 99% was achieved for vehicle license plates detection.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **12** Type: **Abstract for Research Paper**

Developing an offline multilingual mobile app to improve public awareness about COVID-19 to limit its calamity impact

According to the World Health Organization (WHO), 2020 report Coronavirus COVID-19 is a pandemic infectious disease caused by a newly discovered SARS-CoV-2 virus; and very quickly spread throughout the world. The challenge is delivering up-to-date information to the rural population of Ethiopia and Health Extension Workers (HEW) where the mainstream media like TV and radio are not their main source of information.

Different efforts have been made so far by the government of Ethiopia and different societies to create awareness via Ethic-Telecom, TV, FM radios and social Medias. However, the problem mainly still arises in the context that 1) the means of communication in mainstream media is limited reachability, and linguistically are in question in Ethiopian context. 2) Difficulty in conducting training and awareness creation campaigns to produce more professional's, trainers and informers to reach out to the general public across the country. 3) Unable to reach all the citizens in the countries by mainstream Medias due to lack of proper access and limited coverage especially in rural areas. 4) Providing question and answer queries to healthcare professionals and the general public is not in place yet. So it is vitally important to design systems that can go so far and quicker to reach out to the rural and urban community through advanced technology like mobile apps with multiple language setup.

Therefore, a multilingual mobile based application is proposed to create better awareness about the virus and its transmission mechanism to improve public awareness about COVID-19 to limit its calamity impact in the population. The main goal of this project is to design, develop and implement a multilingual mobile application that can work on three languages (English, Amharic and Afan Oromo) for the first version of the app.

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Contribution ID: **13** Type: **Abstract for Research Paper**

Comparative Analysis of Machine Learning Classification Techniques for Neonatal Postprandial Hypoglycemia Symptoms Screening.

Neonatal postprandial hypoglycaemia occurs when blood sugar level (BSL) is too low to cause symptoms of impaired brain function among newborn babies. This is generally accepted as a BSL <2.6mmol/L. When this condition is not detected early and treated, it can result to long term neurological damage, seizures, unconsciousness, and possibly permanent brain damage or death.
Machine learning algorithms are widely used for detection and classification process of the disease. Many researchers are conducting experiments for diagnosing the diseases using various classification algorithms of machine learning approaches like J48, SVM, Naive Bayes, Decision Tree, Decision Table etc. as researches have proved that machine-learning algorithms [1],[2],[3] works better in diagnosing different diseases The Objective of this study is to compare the performance of three machine learning classification algorithms namely Decision Tree, SVM and Naive Bayes to detect diabetes at an early stage.
The Kenya Medical Research Institute (KEMRI), Kenya Paediatric Association and Kenya Ministry of health have created a database on diabetic cases, diagnosis and treatment. This database is developed to support researchers to develop smart systems, policies and frameworks to support patients and clinicians in controlling and treatment of the disease. Experiments shall be performed using this data.
The performances of all the three algorithms are evaluated on various measures such as accuracy, Recall, Precision and F-Measure. Classified instances are used to measure Accuracy. The results show that Naive Bayes outperforms with the highest accuracy of 86.40% comparatively other algorithms. This work forms basis for our next step which is utilizing Naïve Bayes Algorithm and Artificial Neural Network (ANN) for Type 1 Diabetes disease treatment.

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Track Classification: Artificial Intelligence in Health Workshop Abstracts

Contribution ID: **14** Type: **Abstract for Research Paper**

Inventory and Bid tracking system

ABSTRACT
In today's highly competitive business environment, organization is striving to achieve effectiveness, cost, efficiencies and economies of scale. In order for an organization to survive and be effective in meeting their market demand the organization must be cognizant for its supply chain management for better performance and sustained survival. The general objective of the study was to develop a system to track goods from the bidders and Oil marketing firms to enhance reliability, accuracy and ease of use with particular focus on oil-marketing firms. The specific objectives of the study were; easy tracking of goods from the suppliers, transparency in terms of goods delivery for the company given procurement, fluidity in supply of goods and develop a system that enables company go for the best suppliers. A descriptive research design was used in this study. This study targeted few oil marketing firms in Kenya. The target respondents include operational managers, bidders, customers and accountant of the oil-marketing firms. The study collected primary data using a questionnaire, interviews and observation. The study found that the oil-marketing firms were having trouble accessing goods ordered and the updates were not done in time due to the use of manual way of tracking goods. The management of oil-marketing firms needs to modernize its inventory and bid tracking system to increase efficiency, to lower incidences of stock-out situations, increase in levels of customer service, and find the best suppliers with better prices, reduction of associated cost and greater transparency in supply chain management.

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Track Classification: Innovations Challenge Abstracts

Contribution ID: **15** Type: **Abstract for Research Paper**

Challenges Affecting Effective Communication of PHI to Non-Medical Users

There is now a greater need for individuals to access and understand their own personal health information. This knowledge is important and enables one to understand and participate in managing their own health and well-being. Efforts have been made towards making this possible. However, challenges are also experienced. The non-medical users, those without any medical training background, have difficulties in accessing, reading, locating, understanding and interpreting their personal health information. In addition, the medical users, those with a medical training background, have their own medical terminologies and language which makes it even more difficult for the non-medical users to understand their PHI. The study aims at investigating the challenges experienced in communicating PHI effectively to the non-medical users. A preliminary study carried out showed that limited access to PHI, lack of understanding of the content in the PHI reports, lack of proper communication, lack of uniformity in the implementation of the EMR system, are some of the challenges preventing effective communication of PHI to non-medical users.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **16** Type: **Abstract for Research Paper**

online street food management system

The proposed system is an online food ordering application which will resolve natively on GPS enabled mobile device .the major problem encountered occurs when a customer has ordered a meal and takes long to be delivered or not delivered at all .it's due to improper road directions leading to wrong places .sometimes it's difficult to get your balance once you have given out your payment .with new technologies that are coming up today these issues can be comfortably solved. with more knowledge coming up on mobile development technologies such as GPS and trackers the user browser and the website ,upon the success the user runs the system ,register for the first time and consequently logs in to be able to use it in future

It will integrate with GPS functionality of the device to be able to give the exact location of where it is being used from .i have every reason to believe that this project is of a significant economic value because various businesses who will be an integral part to it definitely stand to benefit a lot in terms of sales and exposure

The main aim of this system is to create a web based application that enables customers to order street food online and get it delivered wherever they are and also to allow to customers to make order ,view order and make changes before submitting the order and allow to make payment through Mpesa

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Track Classification: Innovations Challenge Abstracts

Contribution ID: **17** Type: **Abstract for Research Paper**

AN ARTIFICIAL NEURAL NETWORK MODEL FOR THE PREDICTION OF AN INDIVIDUAL'S SHORT TERM BLOOD PRESSURE

ABSTRACT
Hypertension is a serious problem across the globe because of its mortality rate per year. High blood pressure (BP) has no warning signs nor symptoms, and many people do not know they have it. Measuring the BP level is the only way to know about a person's BP status. Many solutions geared toward managing hypertension have been successful, but the condition still persists across the globe. Though there are treatments to help those with hypertension manage the condition, there is a lack of a suitable solution to predict a person's BP based on previous readings and planned future activities. This study aims to take a different approach to this problem through the use of artificial intelligence (AI), machine learning (ML) in particular. This study intends to use a smartwatch, to collect BP and an ML system that will predict future fluctuations of an individual's BP using their future calendar events. This study is to be done in Uasin-Gishu County. The researcher will employ design science and experimental methods for the study. Rapid Application Development will be used in order to design the smartphone application that will capture the data from the individual. The implementation of the ML model will be done using the Iterative and Incremental Development Model. The Holdout method's, test dataset will be used along with Root Mean Square Error (RMSE) and Mean Absolute Error (MAE), to evaluate the prototype based on the predefined system objectives. This study will help individuals to better monitor and control their BP thus reducing their chances of getting hypertension. It will also aid in bringing awareness to those who are unaware that they have hypertension, in order for them to take necessary action to mitigate the condition.
Keywords: blood pressure, hypertension, artificial intelligence, machine learning, artificial neural networks, prediction

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Track Classification: Artificial Intelligence in Health Workshop Abstracts

Contribution ID: **18** Type: **Abstract for Research Paper**

Server Virtualization Technology: A proposed Implementation Model

ABSTRACT
The study sought to fill the existing gap on issues surrounding the implementation of Server virtualization technology, which have received relatively little attention.. The study investigated the implementation of server virtualization technology by companies listed in the Nairobi Securities Exchange. It employed a correlational research design and targeted the IT and Operations departments of listed companies on the NSE. The target population consisted of 120 persons, and the study used a census method. Primary data was collected through use of questionnaires. Data collected was sorted, coded and input into the statistical package for social sciences (SPSS) version 21.0 for production of graphs, tables, descriptive statistics and inferential statistics. Correlation analysis revealed that environmental factors, technological factors, organizational factors and human factors had a positive and significant association with server virtualization implementation.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **19** Type: **Abstract for Research Paper**

Use of Satellite Data to assess climate action in Nigeria: From 2010 till Date

Remote environmental analysis is currently trending around the world especially in Europe, Americas and Asia as it has been used to assess climate action for a sustainable green world. The impact of pollution from an array of technological innovation and activities has impacted negatively on the growth and sustainability of Africa as relevant environmental studies are not done extensively to meet real time needs on the place of interest. Due to lack of training and expertise to study the environmental impact on climate change in Nigeria and other parts of Africa to assist her make informed decision to future prospects and manage resources optimally, which makes the basis of this study.

The study seeks to assess some environmental matrices to analyze its impact on climate change in Nigeria from 2010 till date using satellite data from Copernicus Science Hub platform. Environmental matrices to be studied include: surface temperature, sulphur dioxide, aerosols, chloropyll content, harmful algae bloom„ suspended particulate matter and turbidity. The study will determine correlation, pollution index in connection to environmental standards.

At the end of research, collaboration will be created with environmental stakeholders and interest group to create a workable environmental framework and sustainability in Nigeria.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **20** Type: **Abstract for Research Paper**

CRYPTOGRAPHIC-BASED DISTRIBUTED LEDGER FOR SECURE MEDICAL SYSTEMS

Healthcare information is not only private, but also proprietary and requires higher security and adherence to medical standards and policies by health facilities and providers. A secure system for sharing patients' medical records across health facilities and practitioners is required. Cultural, organizational, regulatory and technological challenges have affected confidentiality, integrity, availability and trust of the medical records. For timely and secure access to patients' data, medical systems should be interoperable, private, transparent, immutable and interconnected. Healthcare sector has applied various approaches and platforms like medical data encryption, distributed ledger, blockchain technologies, authentication mechanisms and access control measures. Blockchain technologies have proved to be suitable through their distributed ledger interconnectivity, transparency, immutability, interoperability and anonymity in medical systems. However, blockchain technology is faced with challenges ranging from computational complexity, practicability, privacy poisoning, cyberattacks due to advanced quantum computing technologies. This necessitates for a solution that is simple, practical, trusted, hack proof, immune to quantum computing and cyberattacks, for guaranteed privacy and confidentiality of medical systems. This study seeks to develop a cryptographic-based distributed ledger to guarantee practicability and security of medical systems. Analyze the state of art of distributed ledger schemes used for medical systems using exploratory research design, develop an algorithm for the cryptographic-based distributed ledger system by prototyping, implement a cryptographic-based distributed ledger system for secure medical systems using agile methodology and undertake a comparative analysis of the cryptographic-based distributed ledger system with selected health blockchain systems. Cryptographic-based distributed ledger will lead to secure, verifiable, private, trusted, interoperable, immutable and interconnected medical systems to ensure timely access, sharing and distribution of medical records across health facilities and health practitioners.

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Track Classification: Masters and Doctoral Colloquium Abstracts

Contribution ID: **22** Type: **Abstract for Research Paper**

MITIGATION OF SLOW HTTP ATTACKS ON INSTITUTIONAL WEB-BASED E-VOTING SYSTEMS IN KENYA

Various institutions in Kenya have adopted e voting systems in order to have efficient and reliable voting processes. However, e voting systems have proved to be susceptible to slow HTTP attacks since the 20th century. This proposal aims to address the shortcomings that current e voting systems in Kenyan institutions have. These include the fact that the security systems in place operate manually and secure systems only in regard to traffic. A slow HTTP attack can easily bypass such security measures and software since it uses very low bandwidth that can go undetected. On the other hand, security systems available for use in the market are too generic and expensive. The main objective of this proposal is to mitigate slow HTTP attack on web –based e-voting systems in Kenyan institutions. This paper proposes the use of a more secure, cost-friendly and user-specific software to secure institutional e voting systems from slow HTTP attack specifically by enhancing security at the application layer.

Keywords: e voting, slow HTTP attacks, mitigation, traffic, application layer

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Track Classification: Masters and Doctoral Colloquium Abstracts