HYBRID

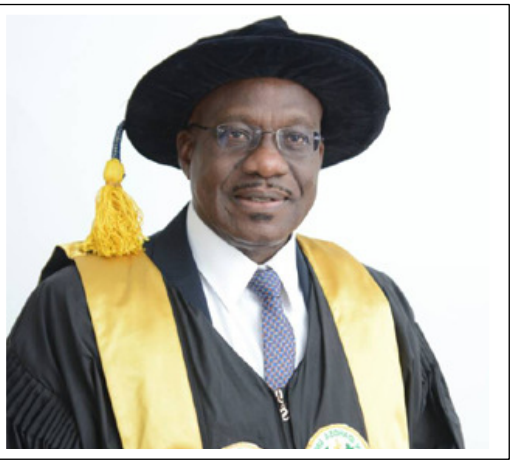
5TH ANNUAL CONFERENCE OF THE SOCIETY FOR FORENSIC AND ANALYTICAL SCIENTISTS NIGERIA

THEME: ARTIFICIAL INTELLIGENCE AND FORENSIC RESEARCH FOR NATIONAL DEVELOPMENT

21ST AND 22ND NOVEMBER 2023

VENUE: UNIVERSITY AUDITORIUM (PENIEL CHAPEL) HERITAGE CAMPUS, UGBOR GRA, BENIN CITY

BOOK OF ABSTRACTS/ PROGRAMME



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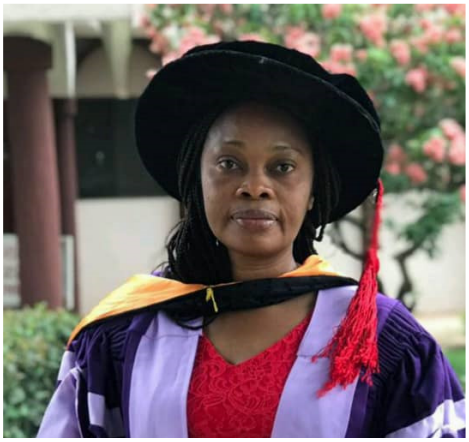

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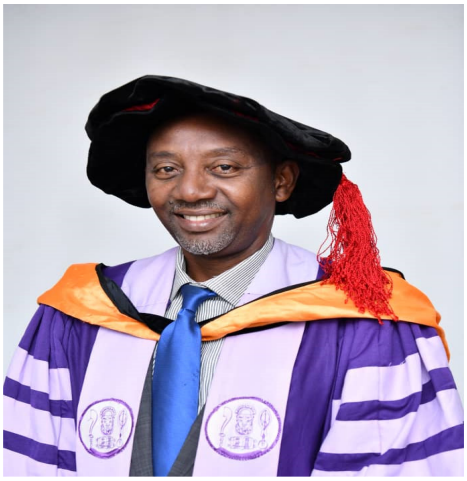
President, Society for Forensic and Analytical Scientist, Nigeria



Prof. Osondu C. Akoma

Chairman, Local Organizing Committee

PROGRAMME SUMMARY

DAY ONE

Tuesday 21st November 2023

Registration of participants

Opening Ceremony

Plenary Session

Technical Session I (Physical and Virtual)

Conference Cocktail

DAY TWO

Wednesday 22nd November 2023

Registration Continues

Technical Session II

Annual General Meeting

Closing and Departure

PROGRAMME FOR OPENING CEREMONY/DAY 1

8:00am – 9:00am	Registration/Arrival of Guests and Participants
10:00 am – 10:05am	Prayer/Anthems
10:05am – 10:25am	Introduction of Guests
10:25 am -10:40am	Opening Address by Vice Chancellor – Prof. Sam Guobadia (Chief Host)
10:40am – 10:50am	Address by President SFASN
10:50am – 11:00am	Address by the Dean, Faculty of Science
11:00am – 11:40am	Keynote Address by Prof. Prince Famous I.O. Izedonmi
11:40am – 12:00noon	Comments and responses to Keynote presentation
12:00noon – 12:30pm	Break/Light refreshment/Photographs
12:30pm -1:10pm	Plenary Speaker
1:10pm – 1:50pm	Comments and responses to Plenary presentations
1:50pm – 2:10pm	Technical Session I (Virtual Presentations)
2:10pm – 2:40pm	Lunch Break
2:40pm – 4:00pm	Technical Session II (Physical and Virtual)
5:00pm – 6:00pm	Conference cocktail

PROGRAMME FOR DAY 2

8:00am – 9:00am	Opening formalities
9:00am – 12:00noon	Technical Session III
12:00pm – 1:00pm	Lunch
1:00pm	Annual General Meeting

PROFILE OF KEYNOTE SPEAKER

Prof. Prince Famous Imoniche Omoigberha Izedonmi was born 27"' December, 1954, in Uzebba, Owan West Local Government Area of Edo State. He attended the University of Nigeria, Nsukka (1976-1978) for his BSc. Degree in Statistics and later transferred to University of Benin, for a BSc. Honours Degree in Accounting and graduated with a Second Class Hons (Upper division) in 1982, MBA (1989), Ph.D. (1999), and later, an MSc. Degree in Economics (2003), all from the University of Benin.

Professor Izedonmi is a Chartered Accountant. Fellow, Institute of Strategic Management, Fellow Academic of Entrepreneurship, Member, Nigeria Institute of Management, Member, Academy of Management, Fellow, Nigeria Accounting Association (Formerly Teachers Association), Fellow, Chartered Institute of Finance and Control of Nigeria.

Professor Izedonmi has published widely both locally and internationally in scholarly journals. He has over 130 publications made up of 107 journal articles, 20 books, 2 public lecture series and excluding chapters in books of Reading.

His academic interest and research areas include Forensic and Financial Accounting, Total Financial Entrepreneurism & Wealth Creation, Accounting Ethics, Auditing and Investigation, Public Sector Accounting and Research Methodology in Accounting. He has produced well over forty-five (45) Ph.D graduates in Accounting and Business and many masters graduates in Accounting.

Professor Izedonmi is an internationally recognized scholar and consultant who has served in various capacities such as World Bank Lead Consultant in component 2; Accounting Development Ethics and standards; ICAN-World Bank Grant (2005-2008): Local consultant ERGP-World Bank sponsored Project on Gap Analysis of the Nigerian Public Sector Accounting and Government Auditing with International Standard (INTOSAI and ISA Audit Model); OAuGF, Nigeria, October. (2009 to 2010).

He has also held several administrative positions within and outside University of Benin, namely founding Vice-Chancellor, Covenant University Ota; Dean, College of Business and Management Sciences. Igbinedion University, Okada, Head of Department of Accounting University Benin, Director Consultancy Service University of Benin and Dean: Faculty of Management Sciences, University of Benin, amongst others.

PROFILE OF PLENARY SPEAKER

Brigadier General Anthony Vote Okpobrisi is a Chief Consultant Ophthalmologist and Medical Director of El-Roi Eye Centre, Ilupeju - Lagos.

The General is also Assistant Provincial Pastor in the Redeemed Christian Church of God and Pastor in charge of IBCF Parish, Apapa - Lagos.

He graduated from the University of Benin as a Medical Doctor in 1981 and bagged the Fellowship of the West African College of Surgeons in Ophthalmology in 1990 and was awarded Fellow of the International College of Surgeons in 2006.

Commissioned into the Nigerian Army in 1979 as a Second Lieutenant, he rose steadily over the years to the rank of Brigadier General in 2003. He has attended many courses in the military and held various appointments, including being Acting head of the Medical Corps. He was awarded the highest award of Grand Service Star (GSS) in 2009 and retired from active military service in 2014.

General Okpobrisi is a keen follower of national politics and is passionate about living a life of excellence and walking in all-round dominion. He desires to see youths who are passionate about excellence.

His favourite quotes are:
"There is enough room on top for everyone."
"Success is not successful until there is succession."
He is happily married with children

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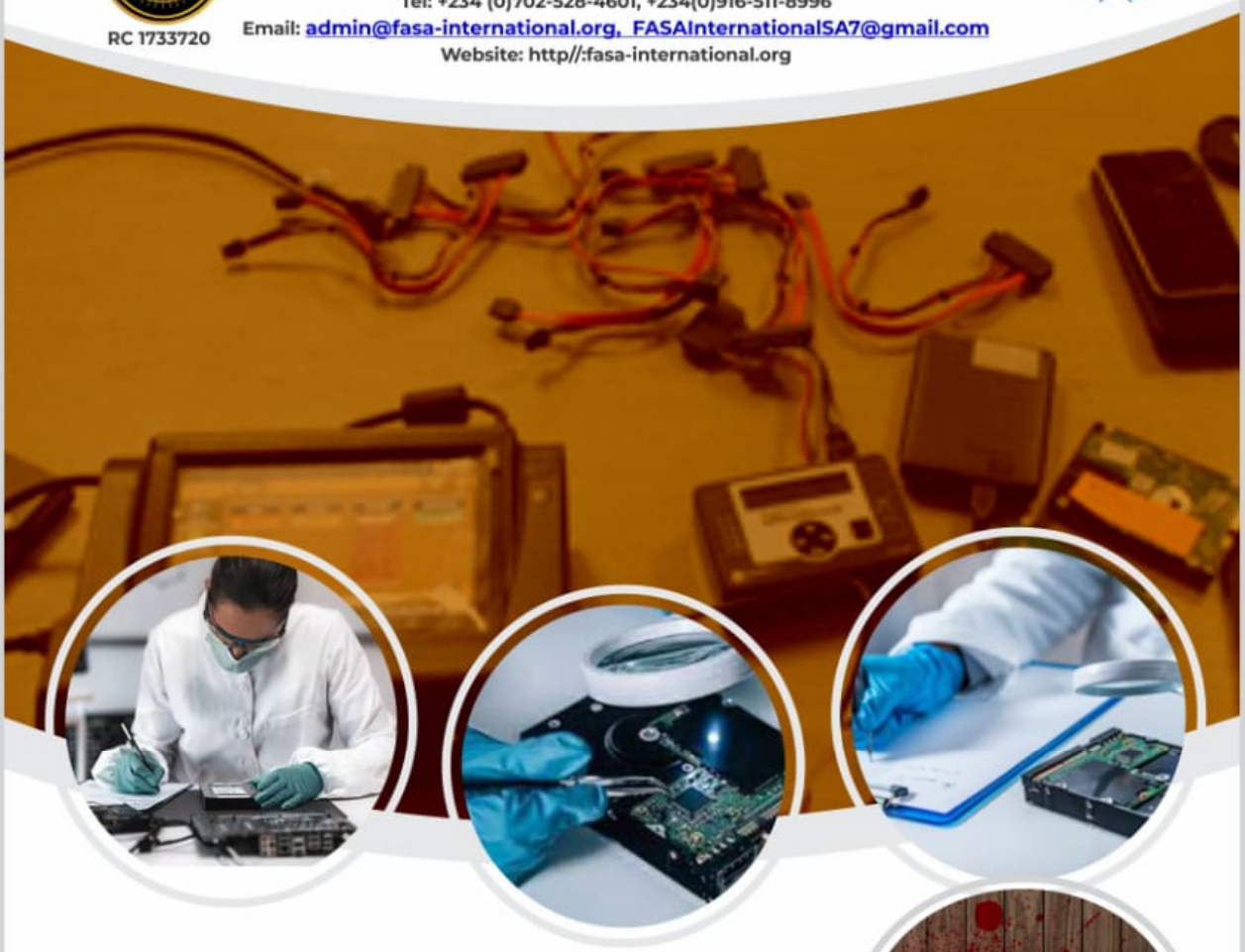

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BOOK OF ABSTRACT

SFASN-BIU2023-0101

RATIONALE FOR CRIME AND CYBERCRIME PERPETUATORS IN EDO STATE NIGERIA

Obasi, Rosemary Obiageli; Osemwegie-Ero, Joy Omeghie*; Jackson-Akhigbe, Beauty and Ikponmwoba, Osasenaga Gift

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Abstract

The paper examined the rationale for crime and cybercrime perpetuators in Edo state, Nigeria. The population of the study comprised of six (06) correctional centers in Edo State, but was limited to inmates convicted of cybercrime in the Oko correctional center, Benin City. As a result of the prison break that occurred in August 2020. The simple random sampling techniques and the Taro Yamane formula was used to derive the sample size of 148 respondents. Primary data was sourced and used. While, the two way factor ANOVA analytical tool was used for the analysis. Findings of the study revealed among others that, opportunity has a positive and significant relationship with cybercrime in Edo state. Incentives had a positive and significant relationship with cybercrime in Edo state and rationalization has a positive and significant relationship with cybercrime in Edo state. The study concluded that cybercrime is an activity that can be detrimental to the financial activities of an organization and the society at large. Based on the results, the study recommends that the avenue that has been created as a result of loopholes embedded in the different dynamics of the legal society should be properly investigated and blocked by the relevant regulatory and prosecuting bodies in order to reduce the occurrence of cybercrime. The Government should make the society enabling for investors, which could provide jobs for thousand other individuals, which could reduce the number of youths and individuals that are lured into cybercrime as a result of the incentives and benefits it brings. Lastly, there should be frequent awareness and lectures by regulatory and security agencies on the dangers of cybercrime, andits effect on business organizations and the society at large.

Keywords: Fraud triangle theory, cybercrime, criminals, regulatory and prosecuting bodies, investors, fraudsters

SFASN-BIU2023-0103

INVESTIGATION OF DNA FROM TRACES OF SALIVA EXTRACTED FROM CIGARETTE BUTTS OF SMOKERS IN LAGOS EXPOSED TO DIFFERENT EXPERIMENTAL CONDITIONS USING STR MARKERS

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Abstract

The investigation done most times by using traces of saliva from cigarette butts as evidence is very complex. This can be attributed to the handiness of the saliva in little quantities and its speedy degradation as a result of the adverse effects of environmental factors which could reduce the quality and purity of DNA and subsequently make it unfit for the use of forensic purpose or other scientific analysis. The study aims to, therefore, analyze the DNA purity and quantity that could be found at the butts of the cigarettes when subjected to both outdoor and indoor environmental conditions which could be used for further analysis. Cigarette butt samples obtained for this study were exposed to both outdoor and indoor conditions for 7 days (a week) simultaneously. Extraction, quantification and profiling of the DNA obtained from the cigarette butts of smokers were carried out using STR markers. The result obtained from this study revealed that the mean ratio of A260/280 absorbance of butt samples on outdoor exposure was 1.19 ± 0.077 after 7 days displaying a bit by bit decreasing trend drift of purity at the duration of the experiment. The butt's samples displayed in the indoor environment showed a mean ratio of A260/280 as 1.60 ± 0.191 after 7 days. Meanwhile, the mean ratio A260/230 of the samples that were put at both outdoor and indoor environmental conditions was in the range of 0.97-3.57. The A260/230 ratio of the extracts is lower than the accepted target. The results obtained from this study revealed that the quantity of the outdoors cigarette butt DNA samples was from 137.8mg/µL to 476.4mg/µL with an average yield value of 344.44 ± 119.192mg/µL whereas indoors was 65.9mg/µL to 459.5mg/µL with an average yield value of 252.47 ± 136.502mg/µL. There were no amplification in the outdoor samples with STR primers for master mix 1 and 2, however, there were amplifications on the indoor samples. The samples exposed to indoor environmental factors were of better quality and purity hence could be useful in human identification rather than the outdoor samples.

Keywords: Cigarette butt, DNA purity, Saliva traces, Environment, STR

SFASN-BIU2023-0105

A CLOUD FORENSIC MODEL DATABASE FOR REGIONAL CYBERCRIME INVESTIGATION

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Abstract

Cloud-based platforms have continued to gain tremendous attention and acceptance owing to their conceived merits especially in mainstream businesses, large scale enterprises, not-for-a-profit institutions as well as in the domain of individual subscribers who are increasingly using the cloud as a safer and more secure archival and processing platform. Cloud computing is of a great benefit for business owners, hence, company owners both private and public organizations are deploying their applications in the cloud which has emerged the target of most cyber-attacks. This study is to design and present a cloud forensic model database platform that drives and support collaboration among regional anti-cybercrime agencies particularly in the conduct of forensic investigation and cyber-attack related activities to achieve this objective, we adopted a mix of sociological, and the object-oriented methodology (OOM). This method helps the cloud model to provide investigators

and decision makers with a common converging point as far as data provisioning for all investigative engagements are concerned and gives better access to resources and infrastructural on a global scale with a lower cost.

Keywords: cloud, database, forensic, model, cyber-attack, mongo DB, OOM.

SFASN-BIU2023-0107

SOCIETAL DIGITIZATION: PATHWAYS FOR SOCIAL ACCOUNTABILITY AND NATIONAL ADVANCEMENT

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Abstract

Societal digitization has led to numerous advancements and has created new pathways for social accountability in most high-income countries. Nigeria's nightmare is the level and rate of corruption in all sectors invariably increasing social disorganization. Social digitization would enhance transparency, participation and oversight in various sectors. This study investigates how the digitization of various sectors could improve our social and personal insight on accountability in all our dealings. The qualitative method of data collection was adopted using a structured in-depth interview guide. A total of 30 participants drawn across various sectors such as education, health, entrepreneurs, banking, state parastatals, security agencies and students' associations were surveyed. Findings from this study support that governments and organizations can promote social accountability through societal digitization such as initiating open data platforms, online participation platforms, crowdsourcing and citizen reporting, digital financial transparency, just to mention a few. It concludes that the inclusion of societal digitization would help curb human behaviour and attitudes that accepts abnormality and dsyfunctionality to be normal.

Keywords: societal digitization, social accountability, pathways, corruption, transparency, national advancement

SFASN-BIU2023-0109

ASSESSMENT OF THE INFLUENCE OF TEMPERATURE ON BRAIN DNA QUALITY FOR FORENSIC STUDIES USING RAPD MARKER

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Abstract

This research seeks to ascertain the influence of temperature and postmortem time on the quality of brain DNA for forensic studies. Seven albino Sprague-Dawley mice weighing between 20 – 30 g were used for this study. One mouse which served as the control was sacrificed and the brain tissue harvested for DNA extraction immediately. The remaining six were divided into two groups, where one group's harvested brain tissues were stored at room temperature of 24°C and the other group's harvested brain tissues were preserved by freezing at -18°C. DNA was extracted from the

brain tissues of one mouse each from the two groups after they had been stored at the different temperatures for 24, 48 and 72 hr. DNA was isolated using an extraction kit and RAPD-PCR analysis was performed using OPC-04 primer: CCGCATCTAC. DNA concentration and purity of each extracted DNA was determined by spectrophotometry analysis, and gel electrophoresis was done to determine the DNA band quality. The results from the spectrophotometry analysis showed consistent decrease in the DNA yield and purity from stored brain tissue samples as compared to the freshly harvested brain sample. The gel electrophoresis showed faint but consistent bands for the DNA extract from the freshly harvested brain tissue and the brain tissue that was preserved at -18°C for 72 hr. Though the best nuclear DNA quality is obtained from freshly harvested brain tissues, the quality of nuclear DNA from brain tissue is better preserved by freezing the brain tissue for long period.

Keywords: DNA quality, Postmortem time, Temperature, Brain, RAPD OPC-4 primer.

SFASN-BIU2023-0111

ASSESSMENT OF GUT MICROBIOTA IN HEALTHY AND TYPE-2 DIABETES MELLITUS INDIVIDUALS

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Abstract

Current trends in the understanding of the aetiology of metabolic diseases have revealed the role of gut microbiota in the development of type-2 diabetes mellitus (T2DM) and obesity. This is to determine the gut probiotic and pathobiont bacteria in Healthy and T2DM Subjects. Stool samples were collected from 110 confirmed T2DM as well as from 10 non-T2DM Subjects. The extracted bacterial DNA was sequenced for V4 regions of bacterial 16S rRNA using an Illumina Next Seq 500 platform to identify and isolate the pathobiont and the probiotic bacteria. Obtained data was analysed using independent T-test and Wilcoxon matched-pairs signed-rank test. The comparison of relative abundance of gut pathobiont bacteria in T2DM versus Non-T2DM were as follows; *Bacteriodes vulgatus* (3.29%) versus (1.81%), and *Prevotella copri* (16.89%) versus (13.87%), were significantly higher ($p<0.05$) among T2DM subjects. Whereas, the comparison of relative abundance of gut probiotics bacteria in Non- T2DM versus T2DM were as follows; *Faecalibacterium prausnitzii* (7.14%) versus (4.03%), *Blautia wexlerae* (3.58%) versus (1.71%), *Bacteroides xylanisolvens* (2.08%) versus (1.33%), *Bifidobacterium gallicum* (1.58%) versus (1.11%), *Roseburia faecis* (1.75%) versus (1.34%), *Ruminococcus bomii* (1.71%) versus (1.62%), *Bacteroides thetaiotaomicron* (1.11%) versus (0.71%) and *Akkermansia muciniphila* (2.38%) versus (1.35%) ($p <0.05$). This study reported a significant reduction of probiotic bacteria in T2DM subjects compared to Non-T2DM subjects. The positive correlation of gut microbiota in T2DM may suggest a causal relationship between altered gut microbiota that increases the risk of development of T2DM. The negative correlation of the gut microbiota in healthy individuals further accentuates this concept.

Keywords: Type-2-diabetes mellitus, Probiotic bacteria, Pathobiont bacteria, gut microbiota

SFASN-BIU2023-0119

TOXICOLOGICAL IMPLICATIONS OF DICHLORVOS ON THANATOMICROBIOME PROFILES AND ABUNDANCE FOR POST MORTEM INVESTIGATIONS

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Abstract

The presence of chemical toxins has a gross effect on the species composition, diversity and community abundance of microbiomes on a decomposing body. This work studied the bacterial and fungal microbial ecologies on dichlorvos-treated carrions and their effects on postmortem microbial clock for post-mortem interval estimation (PMI) during death investigations. Carrion soil, skin, oral and rectal samples were aseptically collected, cultured and microbes isolated from both dichlorvos-treated and control pig (*Sus scrofa* Linnaeus) carrions at the fresh, early and advanced stages of decomposition. The microbes were morphologically identified using microscopy and biochemical characteristics of catalase, oxidase, indole and citrate utilization. A total of seven (7) bacteria species (*Bacillus* spp*, Escherichia coli, Pseudomonas* spp*, Staphylococcus* spp*, Enterobacter* spp*, Clostridium* spp and *Enterococcus* spp) and two (2) fungal species (*Aspergillus* spp and *Fusarium* spp) were isolated and identified from both carrion groups. Lesser microbial community abundance of 26 (46.43%) was recorded from the dichlorvos-treated carrions when compared with the control carrions with higher abundance of 30 (53.57 %). *Bacillus* spp and *Aspergillus* spp were the dominant bacteria and fungi from the dichlorvos-treated and control carrions respectively. Also, there was more microbial fauna abundance from the carrion soil samples of both carrion groups. The study provided good comparative information between the microbiome identities and successions on dichlorvos-treated and control carrions that can be useful in the resolution of medico-legal cases in relation to dichlorvos and other suicidal or poisonous chemical agents.

Keywords: Toxicology, Carrion, Decomposition, Microbiome, Succession, Dichlorvos, Postmortem Investigation.

SFASN-BIU2023-0113

INFLUENCE OF DIGITAL MARKETING OF LIBRARY AND INFORMATION PRODUCTS ON USE OF LIBRARY RESOURCES IN SELECTED ACADEMIC LIBRARIES IN SOUTH-SOUTH NIGERIA

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Abstract

The study canvassed the influence of digital marketing of library and information products on use of library resources in selected academic libraries in South-South Nigeria. The study adopted a 4-

point rating scale questionnaire containing 20 priced items which were administered to100 Librarians, out of which 65 of them responded from four major academic libraries in south-south Nigeria. An item by item analysis of result was carried out by means of tables and simple percentage of the total number of respondents. The result indicated that majority of the 65 librarians who completed and returned the questionnaire agreed that digital marketing of library and information products had great influence on use of library resources, and they are also aware of the numerous benefits of digital marketing in the digital age. Based on the result of the survey, it was concluded that certain information products and services can be marketed and that all effort should be made by all concerns to invigorate the drive for digital technology in marketing library and information products with the sole aim of reaching a wider library user.

Keywords: Digital, Marketing, Library Services, Information, Service Delivery, e-resources

SFASN-BIU2023-0115

THE FORENSIC SIGNIFICANCE OF DRIED SEMINAL AND VAGINAL FLUID BIOCHEMICAL PARAMETERS IN THE CORROBORATION OF THE OCCURRENCE OF RAPE

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Abstract

Rape as a crime is on the increase despite various punitive measures put in place by governments. The major handicaps to the containment of rape are due to societal discriminatory outlooks, poor investigative tools, and expensive empirical evidential biomarkers. To bridge these gaps, it is pertinent to evolve cheap and measurable biochemical biomarkers. Fifty subjects (males & females) were recruited for the study. The subjects voluntarily had unprotected sex with their respective partners. The under wares and pants were collected, seminal and vaginal fluids stained sections were excised and eluted for biochemical analysis. The subjects were divided into four groups; Group A: Absence of sexual intercourse- Female (ASIF), Group B: Occurrence of sexual intercourse- Female (OSIF), Group C- Occurrence of sexual intercourse, bathed and washed- Female (OSIBWF), Group D- Occurrence of sexual intercourse, bathed and not washed- Female (OSIBNWF). The above categorizations were replicated for the male counterparts designed as ASIM, OSIM, OSIBWM, and OSIBNWM respectively. The eluted fluids extracted from both dried seminal and vaginal fluids were estimated for prostate-specific antigen (PSA), acid phosphatase (ACP), gamma-glutamyl transferase (GGT), magnesium, zinc, and phosphorus concentrations. The result revealed a significant increase ($P<0.05$) in PSA and ACP both in the seminal and vaginal fluid stained and stained-washed fabrics compared to the unstained. The findings of the study could be applied to the inclusion and exclusion of alleged culprits of rape cases. Furthermore, the use dry seminal and/or vaginal biochemistry could be used as a preliminary test before DNA fingerprinting and profiling.

Keyword: Rape; seminal fluid; vaginal fluid; electrolytes; prostate antigen, acid phosphatase

SFASN-BIU2023-0117

FULL SIBLING ALLELIC FREQUENCY AND SHARING AMONG FOUR YORUBA FAMILIES: AUTOSOMAL SHORT TANDEM REPEATS LOCI AND AMELOGENIN GENE

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Abstract

Assessment of sibship and allelic sharing extent among the Yoruba ethnic group in Nigeria can be achieved through STR loci. Sixteen buccal swab samples from four selected families were used to examine sibling relationships among 8 full siblings (4 pairs). Amplification of DNA samples using 15 autosomal STR loci and sex typing of amelogenin was conducted by capillary electrophoresis. One hundred and twenty (120) alleles from 8 siblings at 15 short tandem repeats (STR) loci. The four STR loci with the highest frequencies for two alleles shared among siblings are TH01, CSF1P0, D16S539 and D5S818. The five main STR loci with one shared allele among siblings are D18S51, D7S820, D13S317, D3S1358 and D21S11. STR loci with the highest frequencies for zero allele sharing are found in FGA and vWA. Of the 15 autosomal STR loci used in this study, five major ones are recommended for the establishment of full sibling relationships among the Yoruba ethnic group in Nigeria. These loci are TH01, CSF1PO, D16S539, D5S818 and D7S820. These STRs showed high discrimination and maximum inclusivity.

Keywords: Allele sharing, STR loci, Full siblings, Yoruba, Nigeria

SFASN-BIU2023-0121

ETHNO-PALYNOLOGICAL STUDY OF SOME PLANTS USED BY THE ITSEKIRI OF DELTA STATE, NIGERIA

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[2]*Department of Archaeology and Anthropology, University of Ibadan, Nigeria*

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Abstract

A total of 29 plant species from 22 families were studied ethnobotanically and palynologically. Each of the families *Poaceae*, *Cucurbitaceae, Euphorbiaceae*, *Fabaceae, Asteraceae*, *Annonaceae* and *Acanthaceae* was represented by two specie while the remaining families were represented by one specie each. The plant species with the highest usage was *Cymbopogon citratus*. It was used as condiments in cosmetics, as a therapeutic medicinal

agent and as an insect repellant. This was closely followed by *Alchornea cordifolia*, which served as baits for birds, as an appetite stimulant and as a therapeutic agent. While 24 of the plant species found applications as therapeutic agents, only one served as a prophylactic agent. Of the 14 edible plant species, six were used as condiments, five as food sources and three as appetite stimulants. Only one was recorded to be used in each of warfare, religious rituals and cosmetics. In similar fashion, only one served in each of the following categories: as baits (for birds), as an insect repellant and as a beverage. It was evident from the results of the study, that the Itsekiri made use of plant products from 45% of herbs, 38% of shrubs and 17% of trees. This showed that they used more herbs than any other form of plants in their communities. It was also evident from this study that the Itsekiri were very well acquainted with the plants in their environments. They displayed great ingenuity in the discovery of plant uses, and were adept in preparing plant decoctions and even in the prescriptions of dosages to be taken.

Keywords: Palynology, Itsekiri, Archaeology, Ethnobotany, Pollen grains

SFASN-BIU2023-0123

MULTIDISCIPLINARY APPROACHES IN FORENSIC TOXICOLOGY: A CRITICAL APPRAISAL

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Abstract

The impression created in most crime-related TV series depict Forensic Science as a near-perfect means of solving major crimes. However, in real life, it may sometimes point to guilt, but in the end be insufficient to prove it. It analyses evidence and produce written reports which provide appropriate opinions and interpretations in court that are admissible within scientific limits. The interplay of various disciplines in forensic toxicology is essential if justice is the focus in crime investigations. This paper reviews the multidisciplinary approaches in crime investigations as it relates to the use of poisons. The medical profession and murder by poison have connectivity, even in recent times. This is the story of Dr. Mario Jascalevich, who probably killed as many as 25 hospital patients, and the battle that ensued between two sets of forensic experts form the pivot of this review; the outcome of which failed to convince the jury of the doctor's guilt. Jascalevich was the chief surgeon at Riverdell Hospital, New Jersey, US. A number of conventional analytical methods such as ultraviolet absorption spectroscopy, thin layer chromatography, high pressure liquid chromatography, radio-immune assay and mass spectrometry were used by both the prosecution and defence. The ability of the defence to create doubt on the validity of the results obtained made the case against the suspect of no effect. The application of more sensitive advanced microscopic methods and cytogenotoxicity assays such as the single cell gel electrophoresis and loop mediated isothermal amplification have made forensic crime investigations relating to poisons more precise. Thus, the involvement of various disciplines in forensic toxicology is vital for the effective adjudication of justice as *where there is no justice, there is no peace.*

Keywords: Forensic Science, Crime investigations, Poisons, Advanced microscopy, Cytogenotoxicity assays

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DEEPFAKE DETECTION AND AUTHENTICATION IN LEGAL PROCEEDINGS

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Abstract

The fast deepfake technology advancement has come with numerous challenges of digital evidence authentication in Legal cases. Deepfakes poses a serious threat due to being created with advanced machine learning algorithm, with the ability to alter audio and video content convincingly. Serious concern it brings is its potential misuse in court procedures. The major goal of this paper is to develop a framework for identifying and validating deepfake evidence, highlighting the urgent necessity for the legal field to address these issues. Deepfake generating methods, current detection algorithms, and notable court cases that have involved deepfake evidence was first assessed. Then various deepfake datasets were gathered, a model trained and a framework developed. The analysis of the detection algorithms' accuracy, precision, and recall metrics through results and discussions illuminates the strengths and weaknesses of the suggested framework. A careful examination is given to ethical issues, such as privacy issues and striking a balance between security and individual rights. The study's conclusions include a summary of the major discoveries, suggestions for incorporating deepfake detection into legal procedures, and an outlook on how artificial intelligence will develop to protect the integrity of digital evidence in the legal system.

Keywords: deepfake technology, machine learning algorithm, Legal cases

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HUMAN-AI COLLABORATION IN CRIMINAL PROFILING

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Abstract

Artificial Intelligence (AI) intersection with criminal profiling brings about a paradigm shift in forensic investigations. This paper aims to enhance the synergy between collaborative dynamics between human experts and AI systems for more accurate profiling. The conceptual framework is a shift from the traditional criminal profiling method to the introduction of AI. Case study methodology and simulation would be used to analyze historical criminal data, assessing the performance of AI-driven profiling tools in comparison to traditional methods. The goal is to identify areas where human-AI collaboration excels, leveraging complementary strengths in pattern recognition, data processing, and hypothesis generation. Results and discussions delve into the effectiveness of collaborative models, considering interpretability, transparency, and ethical implications. The study explores potential biases introduced by AI systems and proposes strategies

for mitigation through human oversight. Addressing challenges and future directions, the research emphasizes the evolving landscape of AI technologies, ethical decision-making, and the ongoing need for interdisciplinary collaboration.

Keywords: Artificial Intelligence, forensic, criminal profiling, human experts

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FROM VULNERABILITY TO VIGILANCE: SME FRAUD PREVENTION GUIDELINES

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Abstract

In the dynamic landscape of Small and Medium Enterprises (SMEs), the risk of fraud poses a significant threat to financial stability and operational integrity. This paper introduces a comprehensive set of guidelines aimed at transitioning SMEs from vulnerability to vigilance in the realm of fraud prevention. Recognizing the unique challenges faced by SMEs, the proposed guidelines provide actionable strategies to fortify these businesses against fraudulent activities. The vulnerability of SMEs to fraud is rooted in their resource limitations, making them susceptible to various deceptive practices. This paper underscores the need for a proactive shift in mindset – from perceiving vulnerability as a weakness to embracing vigilance as a strategic imperative. The guidelines offered encompass a multifaceted approach, addressing the intricacies of SME operations and tailoring fraud prevention measures to their specific needs. The first key aspect of the guidelines involves creating awareness among SMEs about the diverse forms of fraud and their potential impact. By fostering a culture of awareness, SMEs can empower their teams to recognize red flags and preemptively thwart fraudulent activities. This proactive stance is reinforced by the second key element: the establishment of robust internal controls. The guidelines provide practical insights into designing and implementing internal control mechanisms that align with the scale and nature of SME operations. The third key component addresses the critical role of technology in fraud prevention. SMEs are guided on leveraging cost-effective technological solutions that enhance security without imposing undue financial strain. Additionally, the guidelines emphasize the significance of continuous training and education to keep SME staff abreast of evolving fraud tactics and prevention techniques. The transition from vulnerability to vigilance also involves cultivating a collaborative network. SMEs are encouraged to share best practices and insights within their communities, creating a collective defense against fraud. The guidelines advocate for industry-wide cooperation and knowledge exchange to fortify the resilience of SMEs against sophisticated fraudulent schemes.

Keywords: Small and Medium Enterprises (SMEs), Fraud Prevention, Vulnerability, Vigilance, Guidelines

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CHALLENGES AND PROSPECTS OF ENGAGING ARTIFICIAL INTELLIGENCE IN THE ECONOMICS OF CRIME IN NIGERIA

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Abstract

Applying AI in the economics of crime is not new, but in Nigeria, it is still untapped. This paper addresses opportunities and risks of pursuing AI initiatives; the legal, ethical and practical considerations arising with when using complex algorithms for criminal justice search and crime prevention in Nigeria. The paper begins by providing an overview of economic crime in Nigeria to highlight areas in which AI could potentially be employed. The paper discusses the challenges of economic crime in the Nigerian context, including political and economic instability, porous-borders, limited-resources, and general lack of trust in the justice system. It provides a better understanding of the crime environment so that related AI initiatives can be developed and implemented in a more informed manner. It explores the current capabilities of AI and discusses the potential for its application in the context of economic criminality in Nigeria. Specifically, the paper examines how AI technologies can be used to identify and track fraudulent criminalities and generate actionable intelligence for law enforcement. It outlines the necessary legal and ethical frameworks to aid AI operation effectively and securely. It concludes by outlining the potential opportunities and risks of engaging AI to address the economics of crime in Nigeria. Specifically, it highlights the need for adequate investment in the development and implementation of AI systems with the need for monitoring mechanisms to ensure that the AI algorithms are being used in a responsible manner. The paper further concludes by providing suggestions for future research in the area

Keywords: Artificial Intelligence, Economics of Crime, Economic Criminality, Challenges and Prospects

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ARTIFICIAL INTELLIGENCE AND THE DETECTION OF TRAFFIC OFFENCES IN INTRA-CITY ROUTES OF BENIN METROPOLIS

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Abstract

This paper presents the application of artificial intelligence in the detection of traffic offences in the intra-city routes of Benin Metropolis. This study is situated on the premise that Artificial Intelligence (AI) is a veritable tool for the identification and detection traffic offences within routes in Benin metropolis. This essence is the reduction of numerous road traffic accidents and improves the safety of the traversing public. The study examines secondary data obtained from a number of sources to measure the situation within Benin metropolis, including photographical/video recordings of traffic violations in the city, public records of traffic violations, especially from dependable Media/online sources of data on traffic violations taken from the Internet. The data was pre-processed in order to extract the relevant features from the images and videos and develop models to identify the traffic offences. The models were then tested on the data from Benin metropolis in order to determine their accuracy. AI has the potential to be an effective tool for the detection of traffic offences in Benin metropolis. The models can accurately identify traffic offences, and the accuracy of the models can be improved by further tuning and refining of the features extracted from the data. The research demonstrates the potential of artificial intelligence in the detection of traffic offences in Benin Metropolis. AI has the potential to reduce the number of road accidents in the city, improve the safety of the travelling public, and assist in the enforcement of traffic laws.

Keywords: Artificial Intelligence,, traffic offences, Detection, Traffic Accidents, Intra-City Routes, Benin metropolis

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THE PLACE OF MICROBIAL FORENSICS IN A DEVELOPING NATION LIKE NIGERIA

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Abstract

Forensic science is a growing field which covers a wide spectrum of different branches of pure science such as biology, chemistry, physics, geology, mathematics, and applied sciences such as computer sciences and the social sciences, leading to a practical approach that can be applied in several areas such as bioterrorist actions, environmental issues, emerging and reemerging diseases, as well as reliable trace evidence at a crime scene. This is a multidisciplinary area that has now included microbial forensics as an effective tool in forensic investigations. Using either microorganisms or their toxins is a low-cost potential tool with serious morbidity and mortality

rates that can spread all around the world by food or water supplies or even through the air, making them a perfect candidate as bio-weapon with minimum traceability. Studies have indicated that environmental condition as well as biological and abiotic factors would affect the following analysis and the final validation, which is an essential step in the forensic investigation due to its highly effective role in the court vote. To face different challenges, law enforcement has the infrastructure for attribution and deterrence (e.g., following the exact microbial forensics program) so that it can be used in court. Developing more reproducible, sensitive, and accurate methods, preparing a wide reliable database, and devoting the right amount of budget will help improve the whole forensic procedure in the legal system. In a developing country like Nigeria where a lot of crime is left unsolved, research and development in microbial forensics can help in resolving these problems especially with so much unused human genomic data collated by various organs in the country.

Keywords: Microbial forensics, microbial toxins, bioterrorists, gene sequencing and gene data

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GLOBAL PERSPECTIVES ON AGRICULTURAL FORENSICS: CASE STUDIES AND LESSONS LEARNED

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Abstract

This comprehensive exploration navigates the landscape of agricultural forensics, providing insights into case studies and valuable lessons learned worldwide. In a world where food safety and biosecurity are paramount, agricultural forensics emerges as a critical multidisciplinary field. Examining diverse regions, this review dissects key case studies, unravelling challenges and innovative solutions in response to threats such as foodborne illnesses, intentional contamination, and emerging pathogens. The findings reveal nuanced approaches to prevention, early detection, and swift response strategies. Drawing on lessons learned from these cases, the review emphasizes the importance of technology, international collaboration, and robust policy frameworks in fortifying agricultural forensics capabilities. The synthesis of global perspectives aims to contribute not only to the academic discourse but also to practical strategies for ensuring food safety, biosecurity, and the overall resilience of the world's agricultural systems. As agriculture faces evolving challenges, understanding and applying these lessons on a global scale becomes imperative for fostering sustainable and secure food production.

Keywords: Agricultural forensics, global perspectives, food safety, biosecurity, foodborne illnesses

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CRIME DETECTION AND INVESTIGATION IN BENIN METROPOLIS: *FORENSIC SCIENCE A PANACEA*

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Abstract

Crime and criminality have become a major concern not just to individual but also the government and society at large. More intriguing is the fact that as law enforcement agents are making head way in their crime prevention, detection and investigation, the offenders appear to have gone ahead by making their efforts laughable and of no consequence. With modern technological advancements and the new media, crime commission has become easier for offenders with no corresponding detective advancement on the part of the law enforcement agents. It is against this background that this study seeks to examine Crime Detection and Investigation in Benin Metropolis: Forensic Science a panacea. The study adopts the descriptive survey research design, and its theoretical base was anchored on functionalism. Relevant data were collected with the aid of a self-designed, semi-structured questionnaire among four hundred (400) randomly selected Police Officers, DSS officers, EFCC officers and Military Officers in Benin Metropolis. The study found that law enforcement officers are not adequately exposed to forensic science and that that this hinders their detection and investigation of crime. The paper argues that government should rekindle its effort towards prevention, detection and investigation of crime by training, retraining of men and officers of the various security agencies particularly in forensic science and its applicability to crime detection and investigation in Edo State.

Keywords: Detection, investigation, forensic science and crime

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FORENSIC AUDIT AND INVESTIGATIONS ON POWER DISTRIBUTION IN NIGERIA: A REVIEW OF AN ASPECT OF CORPORATE CRIME PRACTICES IN NIGERIA'S POWER SECTOR

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Abstract

This paper examined the appositeness of forensic auditing and investigation in Nigerian power sector, using BEDC as a focal point. It employed Desk research methodology and technique, Study population was 11 DISCOs in the federation, sample size is 1, which represents 11.11% of the entire population, this covers Edo, Delta, Ekiti and Ondo States. This study disclosed that integration of forensic auditing and investigation into the Nigerian power sector is crucial to the nation's development; it revealed that there is an incongruity in tariff paid by estimated billing, prepaid metering billing as well as community prepaid billing methods. BEDC generates more revenues and more gain from areas where consumers are placed on estimated billing method at the expense of consumers even when electricity supply was not satisfactory. The pre-paid meter billing method helped to ensure that customers and distributors both have a responsibility and a right to choices, preferences and utility where customers are placed on it. The study therefore encouraged NERC to integrate forensic auditing and investigation in order to systematize their billing systems because the frauds perpetuated by both customers and the distributors are as a result of weak internal control system, debility to understand the exploitative activities and the inability of both actors in the distribution section of the power sector to bear the consequences associated with fraudulent practices. BEDC is enjoin to enforce the use of prepaid metering billing method that grants consumers the actual charges that corresponds with consumed watts

Keywords: Forensic Audit and Investigations, corporate fraud, power sector, estimated billing and Prepaid Billing.