



AFRICAN REGIONAL CONFERENCE ON ENGINEERING, SCIENCE, TECHNOLOGY & ENTREPRENEURSHIP

THEME

Innovations in Engineering, Science, Technology and Entrepreneurship for Sustainable Development

DATE: 24th - 25th October, 2019

VENUE: Federal Polytechnic, Oko - Anambra State, Nigeria

TIME: 8:00am

CHIEF HOST

Engr. Dr. (Mrs.) Francisca Unoma Nwafulugo
Rector, Federal University Oko - Anambra State

CHAIRMAN CONFERENCE PLENARY SESSION

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AFRICAN REGIONAL CONFERENCE ON ENGINEERING, SCIENCE, TECHNOLOGY & ENTREPRENEURSHIP

CONFERENCE PROGRAMME

DAY ONE – Wednesday 23rd October, 2019

Arrival of Guest/Conferees/Delegates

DAY TWO – Thursday 24th October, 2019

OPENING SESSION/PLENARY

Conference Registration	- 8:00am – 9:00am
Opening Prayer/Welcome Remark	- 9:00am – 9:15am
Institutional Brief/Chairman's Opening Remark	- 9:15am – 9:30am
Plenary Session	- 9:30am – 12noon
Launch Break/Group Photograph	- 12noon – 1:00pm
Training Session	- 1:00pm – 4:00pm
Policy Review Session	- 4:00pm – 5:00pm

DAY THREE – Friday 25th October, 2019

Departure of Guest/Conferee/Delegates



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Conference Abstracts

An Energy Efficient Linear Wireless Sensor Network (WSN) Routing Algorithm

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²Federal Polytechnic, Oko

Abstract

Many new algorithms have been proposed for the problem of routing data in sensor networks due to challenging nature of routing in sensor networks. This paper presents the development and implementation of an energy efficient linear WSN routing algorithm. A testbed comprising 200 TelosB sensor nodes was set up in River bird environment. The network comprises of the sensor nodes, cluster heads and the sink linearly placed at 10meters apart from each other. The transmission codes were written in C-languages to determine optimum communication modes between nodes and balance uneven energy consumption along the layers. The protocol simulation engine used in this work is Castalia 3.2 and River bird. The performance of the developed linear WSN routing algorithm was done in relation to the existing routing algorithm; LEACH and CTA. The evaluation was based on four important metrics namely: network life time, signal strength threshold, throughput and latency metrics. The result of the analysis shows that the linear WSN routing algorithm results in longer network life time of about 1.8 times that of LEACH and 1.25 times that of CTA, better received signal strength threshold of about 1.5 times that of CTA and 4 times that of LEACH, lower throughput of about 0.67 that of LEACH and higher latency of about 1.5 times that of LEACH and 0.8 times that of CTA.

Keywords: *Routing Algorithm, Energy Efficiency, Wireless Sensor Networks, TelosB node, Routing, Castalia, LEACH, CTA*

Performance Evaluation of Link Quality Estimation Models for Wireless Sensor Network Using TelosB Sensor Nodes

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¹Nnamdi Azikiwe University, Awka

²Federal Polytechnic, Oko

Abstract

Radio Links in Wireless Sensor Networks (WSNs) are often unpredictable because the factors that degrade radio signals are significant on the propagation of wireless signals with low power radios. This paper presents RSSI, LQI, SNR and PRR as parameters for link quality estimation. Experiment was carried out on radio propagation models with specific emphasis on the different parameters of link quality estimation named above. Model equations were developed for all the parameters of link quality estimators using least mean square error method of linear regression analysis. The goodness of fit (R^2) of the link quality estimator models developed were tested and found to be > 0.66 which confirms a good model. From the model equations developed, the link quality of any environment with related radio characteristics as the test environment would be determined at any given distance using any of the parameters.

Keywords: *Radio Links, Link quality estimator models, Wireless Sensor Networks, RSSI, LQI, SNR and PRR*

Green Growth and Sustainable Economic Development in Nigeria: Benefits and Challenges

Dr. Ann Ngozi Ike

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Federal Polytechnic Oke*

Abstract

The global recession has brought new attention to chronic structural flaws in current economic models and assumptions. As economies struggle to recover, many are taking a closer look at the broad concept of a "Green Growth," one that simultaneously promotes sustainability and economic development. Green growth is emerging as a new development trend in the World because the global economy is facing environmental and ecosystem risks. For developing economies like Nigeria, green growth is seen as an opportunity and an optimal choice to change the conventional economic growth model towards sustainable development. This paper examines the benefits and challenges of green growth as a tool for achieving sustainable economic development in Nigeria. It is a qualitative study carried out by collecting documents on the implementation of green economy internationally and in Nigeria, by conducting in-depth interviews with experts in this field. The research data is analyzed using qualitative content analysis as a method. The analysis applies SWOT analysis to identify both internal and external factors that impact to the process of greening the economy in Nigeria. As a result, the study identifies the characteristics of green growth policy, the role of green growth in addressing main challenges related to environmental issues, poverty reduction, social equity and sustainable development objectives. The study recommends the following policy implications to promote the realization of the Green Growth Strategy in Nigeria: raising awareness of green growth, improving the institutions and policies to promote green growth, accelerating economic restructuring, reforming economic growth model, and considering the priority sectors and localities to pilot green growth.

Keywords: *Green Growth, Sustainability, Economic Development, Benefits and Challenges*

Construction Contracting Disputes and Use of Alternative Disputes Resolution Techniques for Sustainable Development in the Nigerian Construction Industry

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Abstract

Construction contracting disputes and use of alternative disputes resolution techniques for sustainable development in the Nigerian Construction industry were investigated using Survey research design with a view to ascertaining their causes and consequences on three Key Construction Stakeholders in Anambra namely: Clients, consultants and contractors. Construction contracting disputes are inevitable and keep occurring. The management of construction disputes is always an acid test of the emotional and intellectual maturity of clients, consultants and contractors. Construction contracting disputes may be destructive but at times constructive. It is important to understand the nature, causes and consequences of construction disputes among clients, consultants and contractors as it relates to claims for more money, time extension, defective quality work and the inadequacy of client brief. The study specifically adopted two alternative dispute resolution methods; mediation and conciliation techniques. These two techniques were purposely chosen because they are non-litigation alternatives, fast and cost-effective. The results revealed that construction contracting disputes are most times money, time, and quality related. The study also revealed that contemporary use of mediation and conciliation techniques is capable of quick resolution of disputes. Recommendations such as discouraging the frequency of construction disputes that are money time and quality related, encourage the contemporary use of mediation and conciliation as non-litigation alternatives, timely and proper dissemination of technical information, incorporation of mediation and conciliation clause in construction contracts, extensive training through seminar, workshops and conferences on the subject of human relationship were suggested as panacea to construction contracting disputes.

Keywords: *Construction contracting disputes, Alternative dispute resolution (ADR), Mediation and conciliation, Construction industry and Construction contracting*

A Prepaid Energy Meter Reading System for Electricity Billing Purpose

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Abstract

Electricity is one of the basic requirements for people and they are widely used for domestic, industrial and agricultural purposes. The measurement of the energy consumed by residential and commercial buildings by power utility (EEDC) provider is important in billing, control and monitoring of the usage of energy. A traditional metering technique (post-paid) used for the measurement of energy is not convenient and is prone to different forms of irregularities. These irregularities include inaccuracies in billing due to human error, energy theft, and loss of revenue due to corruption and so on. This system provides solution to the irregularities posed by the traditional metering technique by allowing the power utility provider have access to remote monitoring capabilities, accurate energy readings, full control over consumer load, and remote power disconnection in the case of energy theft. The system provides high performance and high accuracy in power monitoring and power management.

Keywords: *Traditional Billing System (Post-paid), Prepaid Energy Meter*

Effect of Forecasting in Management Decision Making

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³Henry O. Makinde

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School of Business and Management Studies, Moshood Abiola Polytechnic, Abeokuta*

Abstract

Forecasting is a process of estimating a future event by casting forward past data. The past data are systematically combined in a predetermined way to obtain the estimate of the future. The study identifies the impact of forecasting in ranking projects and the extent to which forecasting assist management in decision making.

Keywords: *Forecasting, Management and Decision marking*

Implementation and Deployment of Internet of Things in Nigeria

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Abstract

Connections between devices and objects are rapidly expanding. Sometimes referred to as 'Internet of Things', one is seeing technology such as sensors embedded in more and everyday things like home security systems. The Internet of Things, IoT, refers to the growing range of Internet-connected devices that capture, or generate, an enormous amount of information every day. It has been described as a development of the Internet in everyday objects have network connectivity, allowing them to send and receive data. Currently in Nigeria there is a slow rate of adoption of IoT compared with other continents, as the biggest mobile market and most populous African country, has enormous prospects in IoT, which if effectively implemented, is likely to bring about increased productivity across all economic sectors and an improved standard of living for the people.

Keywords: *IoT, IoT definitions, Deployment, IoT functional view*

Reliability Assessment on Agulu-Oko-Umunze 33kv Feeder for Rural Electrification: A Case Study of Oko Community in Orumba North Local Government Area of Anambra State

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Abstract

The major problem of electricity consumers in Nigeria is as a result of frequent power outages caused by faults on the distribution line. As it is being witnessed all around Nigeria, Oko community which is fed with the 33kV Agulu-Oko-Umunze feeder is chosen as a case study. Data containing number of faults on each feeder to different villages in Oko Community and their respective downtime were collected. These data collected were analysed mathematically to estimate the reliability of the 33KV Agulu-Oko-Umunze feeder in Oko Community for a period of five years. The reliability indices for the year 2016 and 2017 are being considered as the base study. The outages on the 33KV feeders were studied for 24 months on daily outage data collected from the station. Based on the result obtained from the data analysis illustrated with graphs, it was deduced that dedicated feeders such as Ezioko and Eziabo have the highest reliability and more available compared to others residential feeders. This can be attributed to the level of their load demands. Generally, the feeders have least reliability during the period of May to October due to high dependence of students during the academic periods. The researcher carried out this research due to the frequent outages the community always experience due to the presence of high density of student's hostels and lodges.

Keywords: *Reliability, Availability, MTTR, Failure rate, Feeders*

Application of Electromagnetic Waves in Cardiovascular Treatment: The Case of Atrial Fibrillation in the Human Heart

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²Physical planning unit, Federal Polytechnic, Oko

Abstract

The heart is a large muscular organ with the very important job of circulating blood through the blood vessels to the body. Located in the center of the chest, the heart is the hardest working muscle in the human body — always working, even while we are sleeping. The heart generates electromagnetic signals from a special section of the atrial that makes the atrial [upper chamber] and the ventricle [lower chamber] to beat and pump blood efficiently. The heart and blood vessels together make up the body's cardiovascular system and are vital to supplying the body with the necessary oxygen and nutrients needed to survive. When you breathe, your lungs take in oxygen. When the atrial and the ventricle are not beating in synchronism, it implies that the electrical signal in the heart is generated in an irregular pattern and this gives rise to a medical situation called fibrillation. Atrial fibrillation is an irregular and often rapid heart rate that can increase your risk of strokes, heart failure and other heart-related complications. During atrial fibrillation, the heart's two upper chambers (the atria) beat chaotically and irregularly — out of coordination with the two lower chambers (the ventricles) of the heart. In this research work, the researcher enumerated how electromagnetic waves or signals generated outside the heart using specially made electrical devices called pacemakers and defibrillators could be used to treat these lack of co-ordinations between the heart's two upper chambers (the atria) and the two lower chambers (the ventricles).

Keywords: *Atrial fibrillation, Heart, Defibrillator, Pacemaker, Ventricle*

The Bathtub Curve Analysis and Failure Behavior of Time Graded Relays for Power System Reliability

¹Osuji, Christopher Uche & ²Engr. Cyril N. Okwueze

¹Department of Electrical / Electronic Engineering, Federal Polytechnic, Oko

²Department of Computer Engineering, Federal Polytechnic, Oko

Abstract

Reliability specialists often describe the lifetime operation of products using a graphical representation called the bathtub curve. The bathtub curve consists of three stages: an infant mortality period with a decreasing failure rate followed by a normal life period (also known as "useful life") with a low, relatively constant failure rate and concluding with a wear-out period that exhibits an increasing failure rate. This article provides an overview of how infant mortality, normal life failures and wear-out modes combine to create the overall failure in time-graded relays. It describes methods to reduce failures at each stage of relay operational life and shows how burn-in, when appropriate, can significantly reduce operational failure rate by screening out infant mortality failures.

Keywords: *Bathtub Curve, Infant Mortality, Burn-in, Wear-in, relay*

Internet of Things: Key to Economic Development of West African Sub-Region

Dr. Nwosu John Nwachukwu
*Department of Computer Science,
Federal Polytechnic, Oko, Anambra State, Nigeria*

Abstract

Internet of Things (IOT) is an emerging technology that enables multiple devices that are connected to the internet to communicate and exchange data using sensors and applications on smartphones. IOT interconnect home appliances, office appliances, vehicles, ships, aircrafts, buildings, factories, cities, transport systems, security devices, etc. IOT is a huge cloud that uses computer hardware like system-on-chip (technology), a network card of various kinds, and various sensors that help detect events. IOT leverages on machine learning, chip miniaturization and cloud services. Machine learning is Artificial Intelligence activities that enables the machines on the IOT to learn their environment and take appropriate action when necessary; chip miniaturization enables microchips to be integrated in everything that is connected to the IOT to enable them communicate with applications in smartphones and other computing devices, while cloud providers enables the required IT infrastructures and services to be available and usable by the devices on the Internet. This paper explores the basic concepts of Internet of Things and how the emerging technology can be harnessed to improve the economic development of West African Sub-Region.

Keywords: *Applications, Cloud computing, Internet of Things, Smart technology, and System-on-chip (SOC).*

Application Advantages of Intelligent Modemas Compared to its Interface

¹Amanze, Bethran C., ²Nwoke, Bethel C. & ³Nwaoha, Emeka C.
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Imo State University, Owerri, Nigeria

Abstract

A new generation of intelligent modems lets users concentrate on applications rather than on modem interfacing details. With the incorporation of sophisticated microcomputers, high density RAMS, and advanced communication ICs, the so called dumb modem is being replaced by a new generation of intelligent modems. These modems not only offer features that enhance data communications applications, but also can determine the parameters of the systems in which they are re-installed and adjust their operation to meet system requirements.

Keywords: *Modems, Integrated Circuit, Networks & RAM*

Exploring the Technological Value of Computer in Enhancing Entrepreneurship for Development in Nigeria

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²Department of Electrical/Electronic Engineering, Federal Polytechnic Oke, Nigeria

Abstract

Computer is a vital product of electronic technology that can be utilized in fostering entrepreneurship. Entrepreneurship is greatly needed for development in Nigeria since there is massive unemployment in the nation. The focus of the paper is that the technological value of computer can be explored for enhancement of entrepreneurship for development in Nigeria. Issues discussed in the paper were: need for entrepreneurship in Nigeria, computer as a valuable technological device, and utilization of computer in fostering entrepreneurship. The paper pointed out that computer has the potential to enhance entrepreneurship because it can be utilized to: increase productivity, obtain knowledge, store and retrieve information, secure resources. Recommendations and conclusion in the paper were pivoted on the positive impact in the use of computer for promotion of entrepreneurship needed in development of Nigeria.

Keywords: *Computer, Entrepreneurship, Technology, Development, Unemployment*

Framing the News in the Digital Age: Analysis of News Production Patterns of Channels and AIT in Nigeria

Dr. Onyeka Uwakwe, Arpa

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²*Department of Electrical/Electronic Engineering, Federal Polytechnic Oke, Nigeria*

Abstract

Computer is a vital product of electronic technology that can be utilized in fostering entrepreneurship. Entrepreneurship is greatly needed for development in Nigeria since there is massive unemployment in the nation. The focus of the paper is that the technological value of computer can be explored for enhancement of entrepreneurship for development in Nigeria. Issues discussed in the paper were: need for entrepreneurship in Nigeria, computer as a valuable technological device, and utilization of computer in fostering entrepreneurship. The paper pointed out that computer has the potential to enhance entrepreneurship because it can be utilized to: increase productivity, obtain knowledge, store and retrieve information, secure resources. Recommendations and conclusion in the paper were pivoted on the positive impact in the use of computer for promotion of entrepreneurship needed in development of Nigeria.

Keywords: *Computer, Entrepreneurship, Technology, Development, Unemployment*

Bus Rapid Transit Services and Systems: A Remedy to Public Transport Challenges and National Development in Nigeria

¹Babatope Andrew Ogundare & ²Dominic Chukwuka Ndulue

*Department of Geography
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Abstract

Road transport has become a dominant mode in Nigeria with patronage cutting across individual commuters, private, corporate and government organizations serving as coordinating basis for all modes of transport system. Before the intervention of Bus Rapid Transit (BRT) and up till now, there had been a corresponding increase in road accidents, delay, traffic congestion and overstretched road infrastructures. The aim is to look at how the BRT scheme has been able to address transportation challenges in Lagos State. The study adopted an empirical research design approach to investigate BRT services in Lagos State. The study was based on the data drawn from a target population which is Lagos BRT communities. The sampling unit was based on pilot study using the number of BRT fleets in operation and their capacities, where a total number of 539 BRT users form the sample size. The data for the study were obtained from primary sources through administration of questionnaires. The data collected was subjected to descriptive and inferential statistical techniques. The Chi – square statistical technique was used to find out if the operation of Bus Rapid Transit has no significant difference in reducing transportation challenges in Lagos State. The result shows that BRT has made a significant impact in reducing transportation challenges in terms of safety, comfort, speed, fare structure and waiting time in Lagos State. The study recommends that the BRT scheme should be extended to other parts of the State to ease transportation challenges and encourage sustainable transport development in Nigeria.

Keywords: *Rapid Transit, Commuters, Challenges, National development, Sustainable transport*

Fraudulent Practices and Socio-Political Factors Affecting Land and Property Development in Anambra State

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Abstract

Real estate development and the use of land are prompted primarily by the product satisfaction that could be derived there from. It is a foundation and framework on and within which social, political and economic activities of a nation function. Human life and society cannot exist without land. The production and utilization of social and economic wealth cannot be achieved without land. The real estate market lacks the transparency and homogeneity of most financial markets, and so fraudulent transactions may be more difficult to identify. As each property has unique features the market is heterogeneous. The uniqueness of property as a commodity means that the market itself is not efficient in the same way that financial market prices tend to reflect most of the information available about a particular financial instrument at a given time. The study adopted the ex-post facto research design which explains what happened before the time of the study taking cognizance of the prevailing first observation (O_1) and then what happened after the introduction of the independent variable (X) taken to be the test tool on the second observation (O_2). Data were sourced through primary and secondary sources, which included questionnaires, interviews and review of published and unpublished scholarly works. These data x-rayed the opinion of various land operators on factors affecting land and property development in Anambra State. A sample size of 368 was selected from the study population of 4,650 made up of 250 staff of REDAN, 400 Registered Surveyors and 4,000 Land Lords. Three hundred and fifty (350) or 95% of the 368 questionnaires were retrieved. The data generated were analyzed in tables to answer the research questions formulated using frequencies and percentages. The hypotheses were tested using the non-parametric Binominal test proportion of Chi-square technique. Based on the analysis of the data collected, it was found that several measures have not been put in place to reduce fraud in land acquisition practices on property development in Anambra State and fraudulent practices in land acquisition process has affected investor confidence on property development in Anambra State. The study has basically a single recommendation but with other subsidiary recommendations. On this note, the study recommends that Governments at all levels should make land information system an integral part of the planning, research and statistics unit of the Ministry or Department in charge of land matters.

Keywords: *Fraudulent Practices, Socio-Political Factors, Estate Development*

