DEPARTMENT OF COMMUNICATIONS ENGINEERING

AHMADU BELLO UNIVERSITY,

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BOOK OF ABSTRACTS

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Emerging Innovations in Communications, Electronics and Wireless Technology for National Development

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1. BOTNET DETECTION TECHNIQUE USING ARTIFICIAL NEURAL NETWORK

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Abstract - As the cyber space grows so also are it challenges. The most severe security challenges bothering cyber security researchers around the globe is botnet: a network of systems that is taken over by a hacker to launch attack or perform an unwholesome activity. Botnet as a means of cyber-attack delivery has more far reaching effect that any other means. It is a prime factor in the delivery of Distributed Denial of Service (DDoS), SPARM (mail or fake review), and click fraud among other cyber related crimes. It is equally implicated in most of the activities that are termed cyber warfare. The paper reviews the incidence and purulence of botnet and proposes an Artificial Neural Network based Botnet Detection and classification system. The model was implemented on a ISCXbotnet dataset and an accuracy of 98% was achieved in detection and classification.
Keywords: Botnet, command & Control channel, botmaster, /botherder, zombie,

2. DRAGONFLY ALGORITHM-BASED DETECTION TECHNIQUE FOR MAN-IN-THE-MIDDLE ATTACK IN FOG COMPUTING ENVIRONMENT: A CONCEPTUAL FRAMEWORK

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Abstract—Fog computing is a recent model of computing, in a distributed way that extends the cloud computing operation to the network edges. Fog computing enables storage execution and tasks processing, which relies on the cooperation of users and resource sharing among various devices. The fog being the new shift to cloud computing addresses some critical challenges associated with cloud model by providing notable advantages which are location sensitivity, latency minimization, geographical accessibility, wireless connectivity, mobility support and improved data streaming. Nevertheless, fog computing concept is never an option for replacing cloud computing model. In spite of the attractive solutions found in fog computing, it also inherited some security problems from the cloud. Most of the proposed techniques to solve security issues in fog computing could not completely addressed the security challenges due to the limitation of the various techniques. A fog computing security approach that is based on man- in- the middle attack using Dragonfly algorithm (DA) detection algorithm is conceptualized here. This paper is a framework for detection of MITM attacks that exist between the fog nodes and the cloud and vice versa using swarm intelligence optimization techniques called the DA algorithm which is be implemented on the platform of ifogsim simulator.
Keywords: Fog computing, DA, MITM attack, Cloud computing, Fog security

3. COMPUTATIONAL COMPLEXITY ANALYSES OFADAPTIV QUALIZATION ALGORITHMS IN LINEARLY DISPERSED CHANNEL SYSTEMS

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ABSTRACT
This paper presents a framework for assessing the complexity of adaptive equalization algorithms in a linearly dispersive channel that produces unknown distortion. Three algorithms are investigated including the Leas Mean Squares (LMS), the normalized Lea Squares (NLMS) and the Recursive Least Squares (RLS) algorithm with respect to the sample convergence speed which is the average number of data samples required to achieve steady state mean square error (MSE). The simulation results reveal that the RLS algorithm converges fastest at around 100 data samples and the LMS is the slowest requiring 800 - 1000 samples while the NLMS algorithm requires up to 250 samples to converge. The choice of the equalization algorithm to be used depends on a number of design choice including the SNR sensitivity of the application and the computational power where the RLS - based system is the best choice for low memory systems while an LMS based system is the best choice for noise - sensitive applications.
Keywords: Equalization, Least Mean Squares, Normalized Least Mean Squares Recursive Least Squares

4. DEVELOPMENT OF AN IMPROVED ALTITUDE ESTIMATION TECHNIQUE FOR AMINIMUM CONFIGURATION MULTILATERATION SYSTEM

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Abstract— Multilateration (MLAT) system is known to have high altitude estimation error limiting its application in 3-dimensional (3-D) aircraft surveillance. This paper proposed a technique based on vector polynomial addition of the second-order time difference of arrival (TDOA) quadratic equations aimed at reducing the altitude estimation error of a 3-D minimum configuration MLAT system. The proposed technique is validated at some randomly selected aircraft positions at different flight level (FL)s by comparing with the conventional technique. Monte Carlo simulation result shows a reduction in the altitude root mean square error (RMSE) by at least 50% using the proposed technique based on a square ground sensor (GS) configuration. Furthermore, the proposed technique enables for the implementation of the minimum configuration MLAT system in a 3-D scenario having an altitude RMSE in compliance with the reduced vertical separation minimum (RVSM) initiative.
Keywords— *multilateration, TDOA, altitude estimation, polynomial addition, RVSM*

5. DIGITAL FORENSICS MODEL FOR MOBILE VOIP CLOUD COMPUTING INVESTIGATION

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Abstract— Voice over IP on Mobile Cloud Computing (mVoIPcc) is gaining acceptance as a technology for transmitting voice or video data over IP based cloud networks. This can be attributed to the ability to rapidly develop and deploy VoIP application by mobile application developers and the free billing features of VoIP in correlation to the traditional circuit switch network. This creates two precarious precedents, first of which is attack associated with vulnerability on VoIP protocols such as call management protocols (SIP) and Media Delivery Protocols (RTP). And secondly is the forensics analysis challenge to investigators due to the converged attribute of mVoIPcc communications which are not bounded to any physical location. The latter is further complicated by Cloud Service Providers (CSPs) reluctance to provide vital digital forensics data within the CSPs internal networks. This paper reveals VoIP Digital Forensics Models (f VoIP-DFFSOP and VoIP-NFDF) for detecting, reconstructing and investigating compromised VoIP systems. A hybrid cloud forensics investigation model which consist of Forensic-as-a-Service provided by the CSPs and investigation model that can be adapted to cloud forensics called mVoIPc-IM.

Keywords: Cloud Service Provider, Protocols, VoIP, Forensics Analysis Models, Mobile Cloud Computing.

6. DESIGN OF AN L-SHAPE SLANTED DUAL-BAND MICROSTRIP PATCH ANTENNA FOR LONG-TERM EVOLUTION WIRELESS APPLICATION

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Abstract— In this paper, an L-shape slanted dual-band microstrip patch antenna operating at the 2.1 GHz and 2.6 GHz bands for long term evolution (LTE) application is proposed. The flame-resistant type 4 (FR-4) substrate having a relative permittivity of 4.30 and loss tangent of 0.002 is considered for the design which is probe feed by a 50 Ω microstrip feed line. To achieve the lower band mode of 2.1 GHz and improve resonance at the upper band mode of 2.6 GHz, a slanted L-shaped slot is loaded onto the patch. Simulation results obtained using the computer simulation technology (CST) software shows that the -10 dB operation bandwidth at the 2.1 GHz and 2.6 GHz bands are 40 MHz and 110 MHz respectively. Furthermore, the gains achieved in the lower and upper resonance frequencies are 1.79 dB and 3.06 dB respectively.

Keywords—*microstrip patch, antenna, reflection coefficient magnitudes, radiation pattern, L-shape slot.*

7. DEVELOPMENT OF A PROPAGATION MODEL FOR IEEE 802.11 WIRELESS NETWORKS: CASE OF GIDAN KWANO CAMPUS, FUT MINNA.

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***Abstract*—**Wireless propagation modeling is an essential task in planning wireless networks. In the last few decades, the use of Wireless Local Area Network (WLAN) popularly referred to as Wi-Fi(Wireless Fidelity) in communication system has been on the increase with the exponential usage of handheld cell phones, laptops, and palm-tops to mention but a few. Notwithstanding, WLAN faces a peculiar propagation issue which lies in its changing propagation environment and this affects the quality of service. Poor quality of service is experienced on WLAN of Gidan Kwano campus of Federal university of technology, Minna. This arises due to signal propagation impairment caused by the terrain and the structures within the campus. Received Signal Strength (RSS) measurements were conducted at different locations away from the selected Access Points (APs) both in Line of Sight (LOS) and Non- Line of Sight (NLOS) situations. The path loss exponent (n) and standard deviation (σ) were estimated for the environment. The obtained results were contrasted with the already published work to show the level of agreement. The empirical models were developed for LOS and NLOS situations and compared with the existing standard models.

***Keywords*—**Wireless Local Area Network (WLAN), Path loss model, Path loss exponent (n), Propagation impairment, Access Points (APs), Line of Sight (LOS), Non Line of Sight (NLOS) and Distance in meter, d(m).

8. COMPARISON BETWEEN ANN AND ANFIS-BASED ALGORITHMS FOR DETECTION AND CLASSIFICATION OF FAULT ON TRANSMISSION LINES

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Abstract— This paper presents a comparison between relaying algorithm based on Artificial Neural Network (ANN) and adaptive neuro-fuzzy inference system (ANFIS) technique for the protection of transmission line. A feed forward ANN with six inputs and eleven outputs has been developed for the detection and classification of faults. Data was generated by simulating a 400 kV, 50Hz, 100 km transmission line in PSCAD/EMTDC at a sampling frequency of 2 kHz. Three ANN and ANFIS configurations with different combinations of inputs have been attempted. Initially all the three ANN and ANFIS configurations were trained and tested using truncated data for their comparative performance. ANFIS configuration has been found to be the best one and different set of data have been used for training and testing with different number of epochs and membership function. 'gbell' membership function found to be the best membership function in performance for both training and testing with least error, been 100% accuracy and lesser number of epochs and faster than ANN.

Keywords— artificial neural network, fault detection, phase selection, power system faults, transmission line.

9. A FRAMEWORK FOR MULTIPLE CHOICE MULTILINGUAL TRANSLATION SYSTEM USING HIDDEN MARKOV MODEL AND VITERBI ALGORITHM .

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Abstract— In the multilingual World, majority of languages are in parallel to each other, which make communication among different speakers difficult and burdensome. Most of the existing approaches to language translation focuses on either speech-to-text, text-to-speech, speech-to-speech or text-to-text, but do not consider user's preferences. In this paper, we present a framework for multiple choice multilingual translation system to convert the input English speech signals, text and printed text into Speech and/or text output for users in either Hausa, Igbo or Yoruba. Intuitively, the system consists of four modules, which include text extraction, speech recognition, text translation and speech synthesis modules. We used Mel Frequency Cepstral Coefficients (MFCC) to extract features from the speech signals of spoken words. Furthermore, we used Hidden Markov Model to train and test the audio files to get the recognized spoken word. The Viterbi Algorithm was used to get the most likely path and word combinations. For scanned images and printed documents, Optical Character Recognition was used for text extraction.

Keywords— HMM, MFCC, OCR, Language translation, Speech recognition

10. ARTIFICIAL NEURAL NETWORK BASED PLANT SPECIES IDENTIFICATION

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Abstract— In this research, we proposed an algorithm for the identification of plant leaves based on image processing techniques and artificial neural networks. Image processing techniques help in improving the quality of the images, and hence increase the performance of the identification process and reduce the rate of error. The processed images are used to train an artificial neural network (ANN) for the different plant types. After the training process, the network will be ready to classify and identify the different types of leaves even if there were not presented before. In order to validate the algorithm an experiment is conducted on ten different plant species. The experimental result indicated that the proposed algorithm is able to classify the leaves at high speed with high accuracy.

Keywords— *plant identification, image processing, ANN.*

11. COEXISTENCE OF 5G WITII FIXED SERVICES

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Abstract— Fifth generation (5G) network is a promising technology to support massive connectivity, improves quality of experience as well as supports sophisticated applications. Feasibility studies for deployment of 5G on higher frequency bands up to 86GHz have been recommended during world radio communication conference held in 2015 (WRC-15). Since such frequency band, especially 70GHz, have already been allocated to fixed service (FS) by spectrum regulatory bodies, 5G need to coexist with the incumbent system. This paper investigated feasibility of existence of a terrestrial 5G BS with FS terminal at 70GHz band considering interference from the FS terminal into the terrestrial 5G BS. The study considered a single FS terminal at different positions with respect to the 5G BS and evaluated signal to interference plus noise ratio at each sector of the 3-sector cell terrestrial 5G BS, considering immobile users at the edge of the 5G cell. The results suggested that terrestrial 5G BS can coexist with the FS terminal provided the deployment parameters of the former are carefully chosen.

Keywords—*5G, FS, coexistence, mmWave band*

12. INTELLIGENT IMAGE-PROCESSING FOR CRACK DETECTION ON RAIL SURFACE

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Abstract- Rail inspection is an essential task in railway maintenance. It is periodically needed for preventing dangerous situations and ensuring safety in railways. Currently, most of the inspections are manual and are conducted visually by railroad track inspectors. Inspections include detecting defects on rail. This work presents a vision-based technique to automatically detect the presence of a defect on rail surface. The system uses acquired digital images of rail. An intelligent image-processing algorithm capable of detecting defect on rail surface is the used to achieve hig performance automated detection. Various algorithms related to morphological operations, edge detection, thresholding, segmentation and feature extraction are applied for processing the images of rail surface defect and cracks. For better speed and accuracy, the algorithm was implemented on Matlab.

13. NON ORTHOGONAL MULTIPLE ACCESS BASED INTERFERENCE MITIGATION SCHEMES IN THE EMERGING 5G CELLULAR MOBILE NETWORKS

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Abstract— The emerging 5G mobile cellular network is envisaged to accommodate the increasing data traffic growth from the unprecedented proliferation of smart devices. The developments in the internet of things (IoT) have also led to the emergence of radio access technologies that can only be handled by a network with ultra-reliable low latency. The non- orthogonal multiple access (NOMA) technology is being proposed by 3GPP for 5G network because of its high spectrum efficiency. But interference management remains a major challenge in deploying NOMA techniques. This paper studies the working principles of NOMA techniques, reviews existing NOMA based interference mitigation schemes and proposes multi antenna zero-forcing beamforming vector, two user NOMA clustering algorithm and formulates an optimization problem for power allocation to mitigate inter-cluster and inter user interference in a NOMA based 5G mobile network.

Keywords— Non orthogonal multiple access; 5G network; interference mitigation; Zero-forcing beamforming; power allocation; successive interference cancellation

14. DATA RATE-BASED SLEEP MODE IN LTE HETNETS

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Abstract— Base stations significantly contribute to power consumption in cellular networks. This is a factor which needs to be addressed when modelling cellular networks. This is due to the fact that high power consumption will result in high operational cost. Several energy saving algorithms have been proposed to save energy in heterogeneous networks. This paper therefore introduces a Data Rate-Based Sleep Mode Algorithm for energy savings for a pico evolved NodeB (eNodeB) cell in a Long Term Evolution (LTE) heterogeneous network (HetNet). The algorithm switched the operating state of some pico eNodeB cells to sleep mode (inactive state) at low traffic and medium traffic during which the users are offloaded to other pico eNodeB and macro eNodeB cells to save overall energy consumption in the network. As traffic increased and the average user data rate of the overall network reduced (less than 2Mbps), the pico eNodeB cells return to active state to ensure service delivery was not obstructed. The work considers temporal fluctuations of traffic with a view to achieving higher energy savings.

Keywords— Base station, cellular networks, heterogeneous network (HetNet), sleep mode, evolved NodeB (eNodeB), Long Term Evolution (LTE), pico, macro, average user data rate.

15. OPTIMAL OVERCURRENT RELAY PROTECTION COORDINATION IN DISTRIBUTION NETWORK BASED ON A SIMULATED ANNEALING INERTIA WEIGHT PARTICLE SWARM OPTIMIZATION TECHNIQUE

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Abstract— The coordination of overcurrent relays in a power system is to ensure that only the faulted section of the system is isolated when an abnormal operating state occurs. Large numbers of relay tripping and mis-coordination are due to improper or inadequate settings rather than to genuine faults. A Modified Particle Swarm Optimization (MPSO) techniques which is based on an adaptive simulated annealing inertia weight was used to solve the problem of overcurrent relay coordination. The objective function is the minimization of the operation time of the protective relays in the IEEE 15 and 30 bus networks. The Time of Operation (Top) and Coordination Time Interval (CTI) were used as the performance metrics of the research. The obtained operating time of the IEEE 15 bus is 23.22 seconds. The simulation time of the 15 bus network is 11.22 seconds. Relay no. 11 and 21 with CTI values of 0.0863 seconds and 0.0940 seconds violated the CTI constraints. The result obtained for the IEEE 15 bus was validated and an improvement of 11.3288% was observed in terms of reduction in the operating time of the relays in the system. The obtained Top and CTI settings of the relays in the system show the effectiveness of the proposed MPSO technique.
Keywords - Relays, Optimal Coordination, Plug Setting, Time Multiplier Setting, Coordination Time Interval.

16. DESIGN AND CONSTRUCTION OF BRITISH SIREN TRIGGERED BY HEAT OPERATED SWITCH

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Abstract-Fire outbreak is a common accident in homes and businesses and industrial areas. In our community fire alarms are mostly not used in our houses and shops to give early warning of fire outbreak for possible control. Therefore, in this project we intent to design and develop a fire alarm device made from easy to find components such as 555 timer and thermistor to sound an alarm based on British siren triggered by heat operated switch, for early warnings. The significant of the project is to develop a device that will be able to sense fire outbreak and alarm the fire fighters using alarm. Also, the aim of the project is to develop a circuit that will be able to alarm the environs in the case of fire outbreak. Finally, the significant of the project work is to reduce the level of fire accident.
Keywords—Diodes, fire, alarm, thermistor.

17. DESIGN OF A CELL-PHONE BASED MONITORING AND CONTROLLING SYSTEM FOR POULTRY INCUBATOR

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Abstract: The invention of fully automated artificial incubators brings about the production of large number of birds that are enough for day to day demands. But operating such automated incubators are labor intensive even though they are automated in nature, an operator must always be close to the machine for any malfunction. This research presents another approach to the design of a cell-phone monitoring and controlling of the poultry incubator from the comfort of your home. The control was executed Through Short Message Services (SMS) to the incubator, which in turn executes the exact command and provides a customized feedback message to the master's cell phone. The control was tested from ten different countries (Egypt, Ethiopia, Indonesia, Kenya, Malaysia, Nigeria, Saudi, Turkish, U.K, and U.S.A) with the based station at Ahmadu Bello University (ABU) Nigeria. The tested commands were stored in the EPROM of the micro used. GSM modem was used to initiate communication between the remote and the based station. Such communication was achieved through an algorithm, which utilized attention (AT) commands. The GSM modem was interfaced with the incubator and tested for 19 days of continuous operation in the laboratory. With the proposed control system installed in conventional incubator, the incubator was found to be responded to commands in addition to maintaining the necessary ambient temperature of 37◦C and humidity of 65.1%, which are ideal parameters for incubation. A communication

18. ATTENUATION ANALYSIS DUE TO RAIN AT SATELLITE FREQUENCIES IN NORTHERN NIGERIA

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ABSTRACT Rain attenuation is a major source of signal degradation in microwave satellite communication resulting in unavailability of satellite reception during heavy rainfall. The knowledge of attenuation due to rain and its analyses is an essential consideration while setting up a satellite communication link in order to optimize system capacity and provides quality of service (QoS). In this project, a three year Rain rate data was obtained from the Nigeria Meteorological Agency (NIMET) database for all its centers in Northern Nigeria, the rain intensity was derived by converting the rain statistics obtain from NIMET, the converted data to rain intensity and the ITU-R recommended rain intensity models were used to estimate the deviation of rain attenuations at satellite frequencies (C, Ku and Ka-bands). The attenuation result at lower frequency spectrum especially C-band transponders (4-7.5) GHz are lower, while at higher frequencies above 10GHz, Ku-bands (10.7-12.75) GHz and Ka-band (20-30) GHz the attenuation are high, nevertheless, the research shows that rain attenuation is less severe in the Northern part of Nigeria and require lower fade margin for satellite link design purposes at all frequencies.

Keywords—*Annual rainfall, rain intensity, satellite frequencies,*

19. DEVELOPMENT OF AN AFFORDABLE SMART HOME ENERGY MANAGEMENT SYSTEM OPERETING VIA SMS USING ARDUINO UNO

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Abstract - Energy can neither be created nor destroyed but can be mismanaged which can lead to financial and safety consequences. This work propose a device, using arduino microcontroller, a relay, a GSM module, to develop a remote control in switching on and off of home appliances such as bulbs, air conditions, heaters other energy consuming appliances.
In this paper we are using ATmega8 embedded microcontroller with a dedicated port for future reprogramming in implementing this technique in homes. These appliances like fridge, bulb, fan, television, air conditions, heaters etc. are connected to the microcontroller through the relay. We can switch ON and OFF the appliances by using switches whenever we need. The power consumed by the appliances is measured, the consumption of power by the appliances is measured by the sensing unit. The power used is calculated with the help of current transformer. The reading of the consumed energy will be displayed on an LED display. The GSM module will send and receive command using text massaging. The main significance of this project is to remotely control (ON and OFF) home appliances via text massaging. The device is developed using cost effective and affordable materials.
Keyword: AtMega8 microcontroller, relay, voltage and current sensors, GSM module.

20. DEVELOPMENT OF A WIRELESS INTERACTIVE COMMUNICATION APPLICATION USING ANDROID AND WINDOWS PC PLATFORM

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***Abstract*—** This paper presents the development of a wireless interactive communication system using android and Windows PC platform. The goal is to ensure the deployment of a wireless interactive communication system chat app via Bluetooth and Wi-Fi in an ad-hoc environment, to enables multiple users to chat without internet/data bundles. This app will function as Whatsapp, WeChat, Hangouts etc without the use of data/internet at a range of up to 100M. This Chatting Application is based on a research titled "Bluetooth Chat Application: Bluz by Aishwarya, *et al.*, (2015) which is limited to Bluetooth range of 10M. The proposed improvement is on the Bluetooth Chat Application in terms of long range communication, using both Bluetooth and Wi-Fi connection without the need of any internet service from a provider. The Bluetooth chat app was first developed for Android devices and it worked perfectly through Bluetooth without the use of data. The Bluetooth chat app was then replicated for Windows PC. Then the app was improved by incorporating Wi-Fi as alternate path which has a range of up to 100M. The performance of this application was evaluated in terms of range coverage. Result shows that integrating Wi-Fi as alternate route in the app improved the distance between users by 90%.

21. AN ENHANCED LOGIC-GATE BASED AUTOMATIC WATER DRINKING SYSTEM FOR CHICKS

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Abstract: Water is a resource that need to be conserved. Large volume of water is wasted due to the manual way of water supplied to chick from the batten houses to the chicken grown up cages. These traditional water drinking practice of placing a container of water for chicks to drink does not only waste the water but it also leads to high mortality when a chick mistakenly fall into the water full container. Similarly, when the chicks pour away the water in the container or drink all the water at night, they will remain stave till the owner noticed and refilled again. This paper proposed an automatic water drinking system using the three not-or (NOR) gates of CD4001 as the heart of the design. Two probes were used as water sensors, which are fixed at different level in the water container to enable completed the logic circuit and triggered a 12 V relay. The relay acted as a switched that energizes and de-energizes a mini water pump, which on/off the water supplied respectively to the container through a complex logic strategy. The chicks water drinking system provided an efficiency of 78% as compared to the traditional practice of manual refilling of the water container with the same number of chicks.
Keywords: Automatic, chicks, drinking, logic-gate, water

22. DEVELOPMENT OF A MICROCONTROLLER CONTROLLED SMART PARKING LOT MANAGEMENT SYSTEM

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***Abstract*—**Smart parking lots exist but they are mostly constructed as commercial ventures and as such are complicated and expensive. They normally include ticketing system which may require infrastructure for cashless payments and some form of surveillance systems to ensure patrons do not evade payment of the parking charges. Such system are not suitable for free parking lots. Our developed system is a standalone parking lot system that could be implemented anywhere smart parking lot system is required to manage a free parking lot. This was achieved by using an ATmega328 microcontroller, a servo motor to control the barricade, and infrared proximity sensor to sense the presence of cars. The barricade, display, and control modules were installed at the frontage of the parking lot. A single barricade system is used to control access into and out of the parking lot to keep cost down. The display system is mounted above the entry point for proper visibility to the cars entering the parking lot. The system is cost effective, easy to develop, and could be used on any existing manual-operated car parking lot. The model was demonstrated on a prototype board with good result of the set objectives. That is, the system was able to count the number of cars that have used the facility over a period of time, show the number of cars that are currently occupying the facility, show the number of slot(s) that is/are available, and prevent cars from entry when all spaces are occupied.
***Keywords*—** *Smart parking lot, Infra-red Proximity Sensor, Barricade, ATmega 328P Microcontroller 2*

23. DEVELOPMENT OF A COST EFFECTIVE MICROCONTROLLER CONTROLLED VEHICLE TRACKER AND DEMOBILIZER

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***Abstract*—** Due to the continuous incidents of vehicle theft, it has become necessary for the owners to compliment the factory installed security systems with other systems in order to make the vehicles more secured. A preferred alternative is a car tracker and demobilizer, which is a technology that leverages on the advancements in mobile telephony and Global Navigation Satellite System (GNSS) technology. These trackers are pricey, and are normally imported branded devices which are installed and operated according to the manufacturers' instructions with the users having little knowledge of how they work. Their high cost, servicing and repairs are therefore a challenge. They are also installed by third parties who charge a periodic fee for remote querying and operation of the devices. Due to the challenges associated with the imported trackers, their deployment is not widespread. This research work makes a low-cost tracker equipped with GNSS and basic features available at less than 50% of the cost of the commercial trackers. It has the ability to locate a security risk vehicle and demobilize it on demand. It makes use of accessories bought off the shelve which include a relay module, and Global System for Mobile (GSM) SIMCOM shield called SIM808 shield. The shield is controlled by a microcontroller and has call, Short Messaging Service (SMS), General Packet Radio Service (GPRS), Global Positioning System (GPS), and Bluetooth functions. The microcontroller is an ATmega328P mounted on an Arduino Uno module and programmed with AT commands, a stripped-down version of C/C++.
Keywords*—Car Tracker, Satellite Tracker, Car Demobilizer, GPS tracker, Car security.*

24. EMERGENCY PANIC BUTTON FOR REAL-TIME VEHICULAR ACCIDENT AND ROBBERY ALERT

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Abstract— Highway robbery, Vehicular fire outbreak and vehicle accidents resulting to death, have been on its increase and the fact that families or friends need to know the state (both the condition and location) of their loved ones while on the road is paramount. Hence, the need to create a means to reduce the rate at which this anomaly occurs is a necessity. Systems previously generated, provides only collision detection using servers as a medium to alert recipients, but does not consider situations such as robbery or fire incidence. This work is designed to report robbery, kidnap, and the extent of the fire outbreak and severity of an accident when it occurs. For accidents, the rate of deceleration of the vehicle is measured. For robbery, alert is triggered by the panic button and temperature is measured for fire outbreak. As opposed to previously created systems using servers, SMS (short message service) is used to alert recipient which will save cost and reduce back-end complexity. This is achieved by using a Global Positioning System (GPS) module, Mobile Network which consists of a Global System for Mobile communication (GSM) Module and a Subscriber Identity Module Card, ATMega328p Microcontroller, Accelerometer, Gyroscope, Temperature sensor and a Button to trigger an alert to the recipient. This paper provides solution for a suitable vehicle accident and robbery alert system.
Keywords: GPS Module, GSM Module, Microcontroller, Sensor

25. MEASUREMENT AND ANALYSIS AND THE HEALTH EFFECT OF ELECTROMAGNETIC RADIATION FROM TELECOMMUNICATION MASTS IN SOME SELECTED AREAS IN KADUNA METROPOLIS

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Abstract— this study presents the practical analysis on the electromagnetic exposure emitted by telecommunications mast on the human body in some selected areas in Kaduna metropolis, Kaduna State. In this study electromagnetic radiation from base station antennas installed for various wireless communication purposes was investigated based on the electric field strength E, magnetic field strength H and power density S, at some distances from telecommunication masts owned by the four network providers, namely Airtel, Etisalat, Glo and MTN Nigeria. Five base stations/ masts from each service provider were selected making a sum total of twenty base stations that were surveyed. The EMF Strength meter was used for the measurement then compared the Electromagnetic field (EMF) emission with the International Commission on Non Ionizing Radiation Protection (ICNIRP), Federal Communication Commission (FCC) and Institute of electrical and electronic engineers (IEEE) limits to know if the service provider did adopted the precautionary majors. The all measured power density of the Service provider falls low from 60m to 100m as such it is safe to adequately install a telecommunication masts from 100m away from a residential or public buildings and the percentage ratio of the maximum power density is 1.3034% and 1.0687% observed high at Airtel Mast whereas the least is 0.0308% and 0.0252% obtained at Etisalat mast and said did not exceed the limit.

Keywords— (Electromagnetic Radiation, Base Station Antenna, Electric field, Magnetic field, Power density, health, International Commission on non-ionizing radiation protection, Federal Communication Commission and Institute of electrical and electronic engineers.)

26. IMPROVED AUTOMATIC EGGS' TURNER DEVICE FOR EFFECTIVE INCUBATION

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Abstract: In natural means of incubation, the mother hen occasionally used her beak to turn her eggs twice to four times per day to avoid the embryo from sticking to the egg shell. In semi-artificial incubation, the eggs turning was done using hand to laterally keep the eggs horizontally four to six times per day. The natural way by the mother hen yield good result but is by far less than the number of chicks required worldwide. While the semi-artificial of eggs turning process using hands provided large number of chicks but transmitted diseases due to the direct contact to the eggs, is labor intensive and always leakage out the trapped head of incubation in the process of turning the eggs. This paper proposed an automatic eggs' turning device using a timing integrated circuit configured in an astable multi vibration mode of high time 1.8 ks, low time 1.5 ks and a duty circle of 50%. In every high time pin 3 of the timing circuit goes high and activated the relay which in turn switched a bi-directional DC motor that tilted the eggs at an angle of 450 in the clock wise direction and deactivated the relay which will resulted to the tilting of the egg trays in the anti-clock wise direction. Incubation efficiency was compared with the conventional incubator using hand turning and that with the proposed device, it resulted to hatchability of 87.2% was achieved. The turning control was cost effective with the cost of only three thousand naira, in which the cost of production will drastically fall in mass production.

Keywords: Automatic, efficient, egg's-turner, incubations

27. EMOTION RECOGNITION BASED ON FUSION OF GLOBAL AND LOCAL GRAYSCALE FEATURES WITH SPARSE CODING DESCRIPTOR

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Abstract— Facial emotion recognition study is a vital part of stress level monitoring and human machine interface. Principal component analysis (PCA) is a feature extraction technique based on statistical features which extracted the global grayscale features of an image. But the grayscale global features are sensitive to noise. Local binary pattern (LBP) extracts the local grayscale level features of the mouth region, which contribute most to facial emotion recognition, thereby minimizing the noise level in global grayscale features of facial expression recognition. Extensive experiments have shown that dictionary learning method with sparsely coded features captured vital structures of image and yielded discriminant descriptors for classifications. So fusion of PCA and LBP with sparse coding (SC) is introduced in this paper. The linear kernel multi-class support vector machine (LSVM) is used for facial emotions classification on CK+ dataset. Experimental results show that, this method can discriminate different emotions more effectively with improved recognition rate than the state-of-the-art approaches.
Keywords— facial features, emotion, recognition, grayscale, sparse coding

28. AUTOMATIC BODY MASS INDEX MEASUREMENT DEVICE

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***Abstract*—** Body fat composition is a function of the BMI. The BMI is used for screening the health of the general population due to the strong correlation between being overweight or obese and having health problems, chronic disease and premature death. People who are overweight or obese have an increased risk of hypertension, coronary heart disease, and stroke, type 2 diabetes, osteoarthritis, respiratory problems and so on. An increase in BMI happens so subtle that one may not take notice of it quickly. And since one is not ready to go through the stress of measuring his/her height and weight every day, we have decided to develop a device that will automatically calculate the BMI of a person in lessthan seconds. To achieve this, we used the ultrasonic sensor and the weight cell. This projectis achieved by using Ultrasonic sensor, 200kg weight cell, ATMega328p Microcontroller and 2004 LCD display. At the completion of the project, the test was carried out. The test result demonstrates suitability for an Automatic Basic Mass Index Measurement Boo

29. DESIGN OF MILLIMETER WAVE MICROSTRIP PATCH ANTENNA FOR 5G MOBILE APPLICATION

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Abstract—This paper present the design and simulation of a single band microstrip patch antenna for 5G wireless application operating at 60GHz with a maximum reflection coefficient of -41.648731dB,a very wide bandwidth of 30GHz and a gain of 8.82dB.The transmission line of the antenna used is an inset feed. The substrate used is Rogers RT5880 which has a dielectric constant of 2.2, loss tangent 0.0009, and height 1.6mm.The antenna dimensions were calculated and simulated results have been displayed and analyzed using CST software.

Keywords—millimeter-wave, 5G, u slot and H slot, microstrip, 60GHz

30. DEVELOPMENT OF LOW COST HEART BEAT MONITORING DEVICE USING ARDUINO UNO.

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Abstract— The aim of this project is to develop a low cost heart beat monitoring device. The system consists of three main parts: 1) the optical sensor: consisting of the optical transmitter and receiver for emitting the light and receiving it; 2) the Arduino Uno section: which receives and processes the signal to display the heart rate and will be obtained by measuring the time between signal peaks and then calculating the frequency of the peaks in units of beats per minute. 3) The LCD section which show the reading of heart beat and the implementation of the heart monitor.

31. COMPARATIVE ANALYSIS OF GSM NETWORKS COMMUNICATION CONGESTION IN ZARIA

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ABSTRACT
The study of congestion on GSM networks in Nigeria is necessary as congestion remains a major challenge to telecommunications services provision both to service providers and subscribers. The subscribers are compelled to quit the service provider who fails to meet up with the services required by them. This occurs at a time when the wide spread use of mobile communication has heightened consumers' demand for quality of service anytime, anywhere. Today, network operators face challenges of improving the quality of services. Operators are fast realizing that they are in a highly competitive environment, where subscribers can easily quit them. Dissatisfaction by subscribers gives rise to a high rate of subscriber churn (a situation of stopping doing business with the company or service) and low revenue for the operator. Congestion is a problem all GSM service providers are facing and trying to resolve. Drive test was conducted using Transmission Evaluation and Monitoring System (TEMS) software and congestion was analysed to check the performance of Etisalat, and MTN Networks in Zaria and methods for its improvement were suggested.
Keywords-QoS , KPIs, ITU, Cellular Network and Congestion

32. AN INTELLIGENT DIGITAL DOOR SECURITY SYSTEM WITH PASSWORD RECOVERY

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Abstract— This research implements an Intelligent Digital Door Security System with Password Recovery. The security system is designed on the principle of accessibility by a password code and provides an extended and user friendly security features to security interfaces. Many door security systems have been proposed and implemented by different system designers but fails to proffer integrated combinations of security features to help beat security breaches. Here presented in this research work is a system that has a door sensor, a customized keypad with special keys, password recovery capability, alarm system, password change and a proximity sensor to flicker the LCD back to life as someone approaches. It is expected that the microcontroller unit scans the keypad continuously for a four digit numeric string. When the ENTER button is pressed, the microcontroller unit compares it with the predetermined code saved in the EEPROM, if it corresponds, access is granted else access is denied and an SMS alert reading: "Illegal Entry Attempt" is sent to the facility owner. After three consecutive attempts, the screen of the LCD is frozen and the alarm system is activated. It will blare continuously until a master override code is entered. When access is granted and the door is not pushed open, it locks up after ten (10) seconds.
Keywords—password, GSM module, microcontroller, stepper motor

33. PASSWORD BASED DOOR LOCKING SYSTEM

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ABSTRACT: Security is a prime concern in our day-today life. Everyone wants to be as much secure as possible. An access control for doors forms a vital link in a security chain. Doors locked using conventional locks are not as safe as they used to be because anyone can break in by breaking these locks. In this current situation, the degree of security is feeble. So there is a lot of robbery, theft going on in and around the world. So, people fear to keep any of their valuables in their homes. Henceforth, many people prefer to keep it in banks. In this insecure world, even banks are not safe enough to satisfy people's needs. A common man feels his valuables are secured if there is efficiency in security. Hence this project can give effective security at a minimal cost. Password based door lock system allows only authorized persons to access restricted areas. The system is fully controlled by Arduino. The password can be entered through an electronically wired keypad. If the password is matched with the one stored in Arduino it instructs the solenoid to open the door. The password can be changed by the user interfacing Arduino with a PC and using a keypad to change the password. Unlike previously constructed door locking systems, this system is constructed with an enhanced security capability with more strings/digits of password as well as mixture of numbers and letters this will make hacking of the password nearly impossible. The flexibility enables the owner to change the password at any time he chooses.

KEYWORDS: Arduino, solenoid, LCD 16x2, #27899 4x4 Membrane Keypad, Buzzer.

34. THE INFLUENCE OF INFORMATION AND COMMUNICATION TECHNOLOGY ON ENTREPRENEUR SKILLS ACQUISITION AMONG BUSINESS EDUCATION STUDENTS IN TERTIARY INSTITUTION IN ZARIA METROPOLIS.

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Abstract: This research work carried out on the Influence of Information and Communication Technology on Entrepreneur Skills Acquisition among Business Education Students in Tertiary institution in Zaria. The researcher raised 4 objectives and 4 research Question, Among the objectives are; ascertain the nature of ICT tools used by lecturers and students in teaching and learning in Business Education Programme; Determine the uses of ICT tools in the development of business education students entrepreneurial skills. The population of the study was 486 and 100 respondents were used as the sample size. The researcher employed survey method. Questionnaire was used as instrument for data collection. The researcher recommended that undergraduate students should be provided with necessary skill acquisition tools that will make them self employed on graduation. These tools should be computer oriented as manual methods of doing things in the business world of today are fast being forgotten in our modern world of today; ICT tools like computers, projectors and internet facilities should be provided and made available to the department as the ones available at the moment are grossly inadequate and students have little or no access to them for their practical, thereby necessitating a theoretical or traditional system of teaching.

Keywords: Entrepreneur, ICT, Tools, Acquisition and Vocation.

35. PERFORMANCE EVALUATION OF EMPIRICAL PATH LOSS MODELS OF GSM SIGNAL IN KADUNA METROPOLIS

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Abstract— In this work, comparison was made for some of the most popular empirical propagation models for path loss prediction in order to find a good radio frequency propagation prediction model for GSM 900 and 1800 MHz frequencies bands of Kaduna metropolis. Empirical prediction models used for this work are Free Space Path Loss (FSPL), Electronic Communication Committee-33 (ECC-33), Ericsson 9999 and Stanford University Interim (SUI). Hence, the FSPL showed better prediction for Kaduna metropolis than all the other models under review, a good path loss prediction will improve network optimization which leads to improved received signal for the GSM subscriber.

Keywords—*Path Loss, Propagation, Frequency and Data.*

36. AUTOMOTIVE CONTROL- IDLE SPEED CONTROL

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Abstract— Idle speed control (ISC) is one of the most important control aspects of automotive systems. Varying loads demands can alter the set value of the idle speed which is required to be maintained all the time when the engine is running in idle condition. The control is necessary to reduce the amount of fuel consumption during idle time, lower the emission and also not to cause discomfort to the passengers. In this paper ISC is performed for a spark ignition engine model by simulation using a Nonlinear Control Design Blockset (NCD) of MATLAB/SIMULINK, which is an optimization algorithm adapted online for tuning the PID controller parameters.

Keywords: PID controller, Automotive engine, Idle speed.

37. WIRELESS POWER TRANSFER AND CHARGING SYSTEM: SYSTEM OVERVIEW AND DEVELOPMENT TRENDS

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***Abstract*—**Strong coupled magnetic resonance wireless power transfer is proposed by researchers at Qi in 2007, and attracted the world's attention by virtue of its mid-range, non- radioactive and high-efficiency power transfer. In this article, current developments and research progress in the technology of WPT are presented. Advantage of WPT are analysed by comparing it with other wireless power transfer (WPT) technologies and different analytic principles of WPT are elaborated in depth and further compared. The hot research spots, including system architectural analysis, frequency splitting phenomena, impedance matching and optimization designs are classified and elaborated. Finally, current research directions and development trends of WPT are discussed and the simulation results are presented.
***Keywords*—** *WPT, Frequency, Impedance and Optimization*

38. A NOVEL MODEL FOR NETWORK ANOMALY DETECTION BASED ON NAÏVE BAYES USING WRAPPER APPROACH

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***Abstract*—**The drastic increase in network attack has been a major concern in cyber security especially now that internet usage and connectivity is at high demand. In a way of combating some of these network attacks, data mining technique for network anomaly detection and network event classification attack has proven efficient and accurate. This research presents a novel feature selection approach that eliminates extraneous features to minimise time complexity as well as building an improved model that predict result with a higher accuracy based on wrapper approach for intrusion detection. Attack types are predicted based on Naïve Bayes - the base classifier. From the experiment, our proposed model demonstrates a higher overall performance of 99.73% accuracy, keeping the false positive rate as low as 0.006. Our model performed better than models like as Markov chain, K-Nearest Neighbors (KNN), Hidden Naïve Bayes (HNB) and Boosted Decision Tree (DT). The NSL-KDD is used in experimental setup as benchmark data set using Weka library functions.
***Keywords*—** *component, formatting, style, styling, insert (key words)*

39. A SURVEY OF THE EVOLUTION AND APPLICATION OF MOBILE EDGE COMPUTING

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***Abstract*—** It is difficult to estimate the number of devices connected to the internet. Informed estimates range from 20billion to 50billion by the year 2020. The implication of this is that the sheer number of smart devices trying to communicate on the internet would render the model upon which the concept of Cloud Computing is built, ineffective. The proliferation of Real-time and other resource-intensive applications owing to the advent of Internet of Things and Big Data, as well as the constraints of mobile devices in terms of processing capability and battery life has made computational offloading necessary if Quality of Service and Quality of Experience are to be met. Offloading to Data Centers at the core of the network would reduce but not eliminate delays as latency would still be significantly high. Mobile Edge Computing is a technology that provides a solution to this problem by relocating computational power from the core of the network to the edge. This reduces the distance between mobile equipment and data centers because in most instances user equipment is just a hop away from datacenters. Hence reducing latency significantly and improving both QoS and QoE. This paper surveys the evolution of Mobile Edge Computing and looks at some application areas.

Keywords*—Mobile Edge Computing, Cloudlets, Cloud Computing, Fog Computing, IoT*

40. EFFECT OF VISUAL ANIMATION IN TEACHING AND LEARNING OF TECHNICAL EDUCATION

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Abstract: The study investigated the role of visual animation in teaching and learning of Technical Education (TE). A case study research design was adopted with combination of both qualitative and quantitative research methods. Population of the study was all the lecturers and students of TE in all Colleges of Education (Technical) in South-south and South-east Nigeria using Federal College of Education (Technical), Asaba, Delta State, Nigeria as a casestudy. Of the population of 89 students in five (5) Departments in the School of Technical Education of the College, 50 were second year and final year students targetted for quantitative data. Of the population of 35 lecturers in the five (5) Departments, 10 were selected for interview using stratified sampling technique.Two research questions were used to guide the study. Instruments for data collection were structured questionnaire to measure student perception and semi-structured interview was used for qualitative teacher perception. Data collected were analyzed using mean. The results showed that visual animation played important roles such as demonstration of deeper learning, higher motivation, comprehensive presentation, clarification of principles and concepts, demonstration of abstract topics, better understanding, performance and an increase in student concentration and attention retention in teaching and learning of TE.

41. TEN YEARS OF INTERNET TRAFFIC (2004-2013) ON A USA-JAPAN LINK

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Abstract—The regular capture and recording of traffic on a link between the USA and Japan, as part of the tasks developed by MAWILab (Measurement and Analysis on Wide Internet), allows a study of the aggregated Internet traffic for a large period of time. This research focus on the analysis of ten years of Internet traffic from 2004 until 2013, captured and measured by MAWILab. The collected traffic was analyzed for each of the days in that period, and conjointly in that timeframe. Initial research questions included the test of the hypothesis of whether the change in Internet applications and Internet usage patterns were observable in the generated traffic or not. Several protocols were thoroughly analyzed, including HTTP, HTTPS, TCP, UDP, IPv4, IPv6, SSH, SMTP and DNS. The effect of the transition from IPv4 to IPv6 was also analyzed. The drawn conclusions and the answer to the research questions are reported in this paper.

Keywords—Internet traffic, IP networks, IP protocols, traffic measurement, traffic analysis, Internet traffic history.

42. COVARIANCE FEEDBACK BASED TRANSCEIVER DESIGN FOR SINGLE SOURCE MULTICASTING MIMO RELAY SYSTEM

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Abstract: This paper considers a robust transceiver design of two-hop non-regenerative multicasting multiple-input multiple-output (MIMO) relay systems. The proposed research work aims to minimize the maximal mean-squared error (MSE) between the transmitter and the receiver with further signal processing. In the proposed research, an optimal weighting matrix called relay matrix or proceding matrix is considered as a Wiener filter with singular vectors of the channels matrices at the relay station. Initially, an optimal structure of the relay precoding matrix is derived to minimize the maximal mean-squared error (MSE) in the signal waveform estimation, with the assumption that the relay knows the channel covariance information (CCI) of the relay-destination and the source-relay links. The proposed scheme is closer to the conventional relay algorithms in terms of both MSE and bit-error-rate (BER). In the existing design, the estimated MSE at the receiver nodes is optimum when the channel state information (CSI) of the transmitters to relay link and relay to receivers link are known at the relay node. However, in practice, the actual CSI is not available and it has to be approximated. Hence, due to estimate of the CSI, a channel mismatch is always between the actual and estimated CSI. Hence, a robust transceiver design can improve the performance of the MIMO relay system by taking the channel mismatch into account. Therefore, the robust transceiver design is important and useful for real-time applications. Finally, the problem of robust transceiver design is investigated for a non-regenerative multicasting MIMO relay system, where linear signal processing is applied at the relay node to minimize the maximal MSE of the symbol estimation at the receivers. The optimization problem is non-convex in nature. Hence, the proposed optimization problem cannot be solved directly. Therefore, an optimal algorithm is developed to optimize the transmitters, relay, and receivers precoder matrices by converting the non-convex optimization problem into convex optimization problem using the semi-definite programming (SDP) technique. Simulation results show that the proposed algorithm outperforms the full CSI based algorithms.

43. DISCRETE BAT ALGORITHM BASED FEATURE SELECTION FOR FACE RECOGNITION

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Abstract: This paper presents a discrete bat algorithm (DBA) based feature selection (FS) scheme for an improved face recognition (FR). The stages of the FR involves: Discrete Cosine Transform (DCT) and Haar wavelet based Discrete Wavelet Transform (DWT) were used for feature extraction (FE), DBA was used for FS, and Nearest Neighbor Classifier (NNC) was used as a classifier. Extracted features are mostly discrete in nature, and most of the optimization techniques used in the FS stage of the FR are mostly continuous, and requires a discrete process. However, the DBA was employed for the FS. The DBA feature selection scheme was simulated in MATLAB 2017a environment, and was implemented using two benchmark face database of Olivetti Research Lab (ORL) now AT&T and Yale face database. The DBA gave an improvement in terms of recognition accuracy and recognition time. Also, the proposed DBA based feature selection was compared with linear discriminant analysis (LDA) and principal component analysis (PCA), which showed superiority over the two techniques due to the fact that the problem and algorithm are both discrete in nature.

Keywords: Discrete Bat Algorithm, Face Recognition, Feature Selection, Recognition Accuracy, Recognition

44. A COMPARATIVE ANALYSIS OF OPTICAL MODULATION TECHNIQUES

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This proposal presents a comparative analysis of optical modulation techniques. The basic criteria for selecting a given modulation scheme are Bit Error Rate (BER), Signal to Noise Ratio (SNR), Available Bandwidth, Power efficiency, better Quality of Service, and cost effectiveness. The objective is to compare their characteristics Bit error rate (BER), signal to noise ratio (SNR), Quality of service in order to select a modulation technique best suited for transmission according to desired application. Some of the modulation techniques used are Quadrature amplitude modulation (QAM), Differential Phase shift keying (DPSK) and Phase shift keying (PSK). The acceptable value is achieved in terms of Quality factor i.e. a parameter that indicates the performance in an RF or a circuit and Bit error rate (BER) at a specified distance (km) with a bit rate for different modulation techniques. The software OPTISYSTEM would be used for simulation and evaluation to determine which modulation technique would best meet the user desired application. We expect to have a suitable modulation technique that can transmit signal over a long distance without any degradation in the Quality factor and BER.

45. COMPUTER AIDED MEDICAL DIAGNOSIS FOR COMMON ILLNESSES

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Abstract: In Barau Dikko specialist hospital, there is a constant need for healthcare providers considering the large amount of patients, a lot of people need to go to the hospital leading to long and frustrating queues even for common illnesses. Most would rather get self-medications at nearby pharmacies than go to the hospital for proper examination which endangers their health. To curb this problem, a computer aided medical diagnosis for common illnesses is to be developed. So, instead of going to the hospital and waiting on queue for a long time, the patient can log into the hospital system from wherever they are, interact with the physician and also get appointment if need be. A website will be developed using PHP, HTML5, MySQL and JavaScript. The system will provide a responsive platform where patient can add symptoms and get treatment notification. Even though there are numerous diagnosis sites and applications, this system will provide the patient, the physician and also the receptionist to work from anywhere they are.

46. TECHNIQUES OF REDUCING ENVIRONMENTAL EFFECT OF 2G & 3G CELLULAR COMMUNICATIONS

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Abstract: In a wireless communication, the fixed location or Base Station (BS) represents the key contributor to the of a wireless telephone network. This paper shows the worked analyses on the saving energy consumption of 2G and 3G communication significantly at the BSs under full traffic load operations. Green Communication was deployed for the reduction of ecological effects. The relationship between power consumption at the BS and the average traffic load has been measured which resulted to a linear relationship of power consumption was developed.

47. COMPETITIVE BENCHMARKING DRIVE TEST & SERVICE QUALITY ANALYSIS OF FOUR MAJOR GSM/WCDMA NETWORK OPERATORS USING ASCOM TEMS

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Abstract: The Quality of Service (QoS) and Grade of Service (GoS) provided by network providers should be measured to allow subscribers (end-users) to be able to grade and know which network provider is the best and also for the appropriate authorities to take measures against the low Quality of Services. This research is aimed at benchmarking the four major network service providers to rank them and also to make recommendations where necessary. If the results and conclusions are taken into consideration, it will help to improve the Quality of Services (QoS) provided. During the course of this research ASCOM Transmission Evaluation Monitoring System (TEMS) software were used to collect data (logfiles) and also to analyse them. The results are presented in Microsoft packages for easy comprehension.

48. DESIGNED AND CONSTRUCTION OF HOME AUTOMATION SYSTEM USING BLUETOOTH

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Abstract: Home automation is primarily done to improve the level of comfort of the user also used to improve the safety of our home devices and energy management. This project proposal work focus on the designed and implementation of home automation system using Bluetooth. This are done using the following current sensor technology, infra-red Transmitter, Arduino, Android phone .This designed is to achieve by using datasheet and reference circuit to design the schematic diagram using proteus platform. The software consists of Arduino sketch for programming the microcontroller using java or C ++ languages, which make up the android application used to communicate with android phone and Arduino. At the end we will be able to access and control home appliances using Bluetooth, by using the system to save energy, time to operate within the network coverage area.

49. DESIGN AND CONSTRUCT A MICROPROCESSOR BASED SOLAR CHARGE CONTROLLER, USING MICRO CONTROLLER AT MEGA8

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Abstract: This paper work is to design and construct a microprocessor based solar charge controller, using micro controller Atmega8. The micro controller will generate all the necessary control signals to switch all other component in the circuit. The design will consists of current booster, battery level indicator, battery charge controller and power supply unit. The voltage and current flowing in the system will be display on a liquid crystal display screen. The design was simulated with proteus7 before implementation, The prototype in this paper is to prevent damages to the battery associated with unregulated charging and discharging.

50. DESIGN OF 60GHZ MILIMETER WAVE MICROSTRIP PATCH ANTENNA FOR 5G MOBILE APPLICATIONS

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Abstract: This proposed project, a single band microstrip patch antenna for 5G wireless application is presented. This proposed antenna is suitable for the millimeter wave frequency. The single band antenna consist of new H slot and E slot loaded on the radiating patch with the 50Ω microstrip line feeding used. This single band antenna is simulated on a Rogers RT5880 dielectric substrate with relative permittivity 2.2, loss tangent 0.0009, and 1.6mm height.The antenna is simulated by Electromagnetic simulation, computer software technology Microwave studio(CST). The proposed single band antenna would be analyses and simulated using the following antenna parameter return loss, VSWR, surface current and 3D radiation pattern with the target frequency for resonance at 60GHz.

51. DESIGN AND CONSTRUCTION OF A HANDHELD ZERO CONTACT TACHOMETER

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This project work is about the design, construction and implementation of a GSM controlled Distribution Board. With advancement in the field of GSM technology and its user friendliness, mobile phone has become an integral part of man in his daily life. In many instances it is desirable to turn on or off some appliances, such as lighting point, fan, air conditioning and some selected switches before arriving home, as is applicable in this project, this is known as home automation systems. This project uses the Dual-Tone Multi Frequency (DTMF) technique used in touch tone telephones, to control multi electronic devices from long distances using the mobile phone. A practical application case for this system will be implemented to control twelve electronic devices. But this design can be expanded to control a maximum of 144 devices. A test will be carried out to detect the DTMF signal received from different mobile phones. The DTMF decoder will be tested for accurate detection of the presence of these tones under various conditions. The automation features of this work will make it possible for home owners to remotely control a large number of appliances, indoor and outdoor lamps and lights, landscape sprinkler timers and more using their mobile phones.

52. DESIGN AND CONSTRUCTION OF A HANDHELD ZERO CONTACT TACHOMETER

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This project presents the design and construction of a handheld zero contact tachometer. To achieve this, infrared sensor will be used to detect the spinning rate of any rotating shaft in revolution per minute and a microntroller to interface the sensor to a Liquid Crystal Display (LCD) and also process data detected by the sensor. The objective is to obtain a cost-effective, easy to use and easy to deploy device which is used to measure spinning rate of any rotating part and speed of any car irrespective of its tyre size. This provides function to be used as a tachometer, speedometer or both speedometer and tachometer. This proposed design is applied in the vehicle to measure speed (Km/hr) and spinning rate in Revolution Per Minute (RPM) of rotating parts.

53. DESIGN AND CONSTRUCTION OF ARDUINO MICROCONTROLLER BASE TEMPERATURE, HUMIDITY AND WIND SPEED MEASUREMENT

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Abstract: Weather plays an important role in human life. Temperature, Humidity and wind speed are some of the most measured weather parameters. In most cases it is competent to measure and read out the occurring temperature, humidity and wind speed value of an environment, for useful analysis and future weather prediction. However, it is vital to see the direction and variation of such measured values over a long period of time. The project involve the design and construction of Arduino Microcontroller based Temperature, Humidity and wind speed Measurement. The microcontroller will acquire digital temperature values from precision temperature, humidity and wind speed sensor within a range of 0 – 150 0C for temperature, and a range of 22 – 100% for humidity base on the design specification. Also the designed system is used to find out the all possible common wind direction such as, east, west, north, south, north-west, north east, etc. Moreover, the system is able to show the angle of wind. Whose values are then processed using embedded software and then send toa Liquid Crystal Display (LCD) connected to the microcontroller to display the measurement value. The design system is tested under different conditions; at room temperature and at low temperature, readings are taken over large time for all this condition, the system performs accurately.

54. DESIGN AND CONSTRUCTION OF WATER LEVEL ALARM

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Abstract: For decades, switching system were basically operated manually and this type of operation requires an operator. The present advancement in electronics has render manually operated devices less effective due to their time consuming nature. Presently, electronic devices act as a substitutes for human operators capable of thinking and making fast accurate decision. This has led to its application in performing efficiently and accurately in many task.In keeping with today's technological advancement and necessity to developed uncompromising devices which do not required any human activation to help regulate the flow of water into a tank,it is therefore necessary to design and construct an electronic system to aid in curbing the problem. The versatile water level controller, which incorporates an alarming system and other adaptations in a single system to trigger on the circuit, will serve as a good tune to solve this problem, hence the design and construction of this device that isdesign and construction of water level alarm system.

55. A REVIEW OF EMERGING INNOVATIONS IN INFORMATION AND COMMUNICATION TECHNOLOGY: AN ISSUE FOR BUSINESS ACTIVITIES IN NIGERIA.

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Abstract: Technology companies often gain competitive advantage by causing market disruption through their ability to understand and act on technology trends. But very insignificant marketing via the information communication technology is recorded in Nigeria. This call for a need for Nigeria business organizations to keep abreast with the emerging innovations in information and communications technology. The objective of the study is to point out emerging innovations in information and communication technology for Nigeria business organization. the study uses desk research and data were sourced from published journals, text books and other published work of scholars as well as online information. Theoretical and empirical studies was made. The findings revealed the emerging innovations in ICT and concluded that the use of emerging innovations in communications, electronics and wireless technology will enable business to improve their flexibility, interactivity, effectively and competitiveness.
Keywords: Information, Technology, Communication, Business, E-commence, Competition.

56. ENERGY MANAGEMENT AND CONTROL: THE DESIGN AND SIMULATION OF AN ACTIVE- AND PASSIVE-TYPE ENERGY MANAGEMENT DEVICE TO MITIGATE DOMESTIC ENERGY WASTAGE AND CONSUMPTION

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Abstract: Electrical power issues in Nigeria have its arm in all levels; generation, transmission and consumption levels. This paper focuses on the consumption-related problems. The lackadaisical and ignorant attitudes of most domestic electrical energy consumers have led to some electrical mishaps, equipment breakdown and wastage of energy. Considerable efforts have been made in the area of information dissemination through the mass media and printed bills to enlighten the populace on power-saving and safe practices; yet, the results are negligible. Hence, a more aggressive approach is needed for energy management. Two design models were proposed in this paper. The first model is an active energy management device (EMD) using feedbacks from wireless sensor nodes (WSNs) strategically located in different areas within the house to automatically avoid energy wastage when it is not in use. The second model is a passive energy management device (EMD) that directly limits energy consumption when applied with some selected load types (or appliances). A control algorithm was developed for the receiver unit of the active EMD. The simulations for the active- and passive-type EMDs were carried out using MATLAB Simulink and Proteus Electronic simulator respectively.

57. AUTOMATIC MICROCONTROLLER BASE SOLAR FISH FEEDING SYSTEM

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Abstract: One of the most lucrative businesses in Africa and the world at large today is fish farming. Two major challenges of a fish farmer is the problem of accurate feeding timing and the timely regular need for changing fish pond water. This article is focused on providing accurate electronic feeding time and also solving the problem of changing fish pond water. The feeding system and the oxygen bubble generator are all programmed with a Peripheral Interface Controller (PIC) Microcontroller (PIC 16F877A). The morning and evening feeding by the system is based on a specified alerting time in the program. The oxygen bubble generator, on the other hand, produces air bubbles from a water pump that recycles water for four to five hours before taking a two hour rest. When air bubbles are produced, the water does not need to be changed because the fishes are energized. The system will give health and fast growth of the fishes with suitable living temperature and also safe cost by non–replacement of water regularly.
Keywords: Feeding time, Motor control device, Charging device, Battery monitoring device, Temperature control device.

58. AUTO-REVOCATION PUBLIC KEY CRYPTOGRAPHY AND THE KEY VALIDITY PROBLEM IN PKC ENVIRONMENT

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Abstract: This paper introduces the concept of Auto-Revocation Public Key Cryptography (AR-PKC). AR-PKC is a newly introduced public key verification paradigm that aims to address the shortcomings of earlier schemes in Public Key Cryptography (PKC) systems. AR-PKC does this by avoiding the bottlenecks in those schemes. Any PKC-based system requires a form of key management structure for validating the genuineness or otherwise of users' public keys and their associated claimed identity. Also a means of checking that known to be genuine keys are still valid as at the time of use is equally essential in a PKC-based system. In this paper, we demonstrate how AR-PKC handles these tasks and thus, improves over above earlier approaches to key verification and validation of a PKC system

59. EQUALIZATION OF BROADCAST LOUDNESS USING FEED-FORWARD LOUDNESS CONTROL AND ADAPTIVE PARAMETER CONFIGURATION

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Abstract: Loudness is a subjective measure of how loud an audio signal is perceived. Due to commercial pressures loudness has been exploited in broadcasts to attract and reach viewers and listeners. Sudden changes in loudness between television channels and programs are significant causes of nuisance for the consumers. With the transition from analogue to digital TV, loudness related issues are on the rise hence, the need for objective and accurate techniques for digital broadcast. The measurement of perceived loudness is difficult yet an important task. Many research efforts have been introduced for objective measurement and equalization of the loudness of audio channel or program in order to facilitate program delivery. In this paper, broadcast contents were examined to discover where loudness occurs in a program and how to achieve equal average loudness between broadcast programs. A modified scheme was developed based on a standard set by ITU- Radio and European Broadcasting Union by incorporating a feed forward loudness control (FLC) mechanism and an adaptive parameter configuration (APC) scheme for the purpose of addressing loudness in long and short form contents.
Key Words: Loudness, Audio Signal, Long Form Content, Short Form Content, Audio/Loudness Normalization, Program Transition.

60. DEVELOPMENT OF A MICROCONTROLLER BASED DIGITAL TELEPHONE TRAFFIC CONTROL USED FOR RADIO AND TELEVISION PHONE-IN PRODUCTION

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Abstract: In radio and television business, adequate dissemination of information to the target audience is often of primary importance. Phone in programs gained wide acceptance in the last two decades and more especially with the growing passionate for reality radio. The device is to serve as a unit for controlling incoming telephone traffic during a phone in program in a radio or television studio. A phone in program is a radio discussion production where viewers or listeners are given the opportunity to contribute in the discussion. The setup of the production allows two to three professionals discuss important issues relevant to the society, whereby contributions outside the studio from the audience through the telephone lines can be heard. In this paper, a microcontroller based telephone traffic control system is developed. The system is made up of two receiver sets and a system that samples calls and then sends one call at a time to the presenter. The same system is able to realize when the contributor is through with his contributions, so that another call that is on hold can be released to the presenter. The work is targeted at controlling the indiscriminate flow of calls from contributors outside the studio during the phone-in production. The system is intended to be used in radio or television studio during phone-in programs as a valuable contribution to society.

61. DEVELOPMENT OF MICROCONTROLLER BASED SUN TRACKER

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Abstract: Solar energy is rapidly gaining importance as an alternative source of energy. To make solar energy more viable, efficiency of solar panel system must be maximized. A feasible approach to maximized the efficiency of the solar panel systems is the sun tracking. This paper is about moving a solar panel along with the direction of sun light; it uses a motor to change the position of the solar panel, motor is controlled by Atmel 89c51 microcontroller, which detects the sun light using photocells and liquid crystal display (LCD) to display the charging voltage of the PV module at every point in time.

62. STUDY OF MASSIVE MIMO PERFORMACE IN A RICH SCATTERING SCENARIO USING GEOMETRY-BASED STOCHASTIC CHANNEL MODELS

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Abstract: This paper Studies the performance of MASSIVE MIMO system using a geometry based channel model. In order to achieve reliable channel models in particular for evaluation of multi antenna system designs, channel measurements are necessary within the targeted deployment and propagation scenario. The WINNER II is a Geometry-Based Stochastic Channel Model developed within European projects and relies on careful analysis of mobile radio measurements. The objective is to study Massive MIMO performance in a rich scattering scenario with a mix of LOS and NON-LOS propagation also considering path loss and shadowing model. Massive MIMO was simulated in typical urban macro cell and outdoor to indoor macro cell fading characteristic scenario. Results demonstrates the advantages and prospects of using MASSIVE MIMO to deliver reliable transmission while exploiting diversity and spatial multiplexing

63. IMPROVING NUMBER OF PACKETS DELIVERED IN WIRELESS SENSOR NETWORKS USING AN IMPROVED MULTI-HOP ROUTING PROTOCOL

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Abstract— Wireless Sensor Network (WSN) routing protocols is a research area in the field of wireless sensor networks (WSNs) that is receiving tremendous attention. This is due to the unique nature of WSNs. A WSN usually has several resource constraints. Routing protocols in WSN ought to cater to this constraints in a bid to utilize the limited resources maximally. One of such constraints is limited energy of the sensor nodes (SNs). Researchers are therefore burdened with developing new routing protocols, modifying existing routing protocols as well as developing hybrid protocols with the aim of utilizing the limited energy as much as possible. This research paper presents an improved multi-hop routing protocol (iMRP) in WSNs. The protocol seeks to address the distribution of energy levels among functional nodes during the routing of data to a designated base station (BS) in order to deliver more packets to the base station (BS). This is achieved by considering transmission distance as well the energy level of functional nodes during the multi-hop routing of data to the BS. A functional node having sufficient energy and located within a coverage threshold is selected as the next hop along the multi-hop routing path. This protocol was implemented on a 200 m2 and a 400m2 field.
Keywords— WSN, multi-hop routing, limited energy, number of packets, iMRP.

64.CLOSED CIRCUIT TELEVISION SYSTEM (CCTV) DESIGN AND INSTALLATION: A CASE STUDY OF EEED, KADUNA POLYTECHNIC.

By
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Abstract
Closed Circuit Television Systems (CCTV) are becoming very common and are being installed in many workplaces, housing estates, and in most unrestricted places. The increasing threats of insecurity and the sudden surge in students' intake that is likely to over stretched staff during the conduct of examination in Electrical and Electronic Engineering Department (EEED), Kaduna Polytechnic have prompted the deployment of this security device for monitoring and to deter criminally minded syndicate. Recent events show the vandalization of offices and classroom fittings/appliances and theft of Laptops. This paper proposed the design and installation of CCTV system in EEED. The CCTV cameras are to be installed in Telecommunication, Electronic, Skill G laboratories and corridors in the department. These laboratories are used as examination halls for students. The CCTV will help to display and track actions. The design analysis considered in this paper is based on three different cameras (fisheye, indoor dome and bullet). A comparison of the results shows that, the fisheye camera was suitable for this work. In addition, during the implementation, the connections were made in a wired system to cover decent field of view. The cameras were directed to center on details of concern with high resolution. The design adopted the PSA 2006-12 standards for performance evaluation of the CCTV system, with the optimal placement of the cameras producing adequate coverage. Future work will address the application of Scale Invariant Feature Transform (SIFT) to reduce memory requirements of the CCTV system.
Keywords: CCTV, Fisheye Camera, SIFT, Laboratory, Examination, Malpractice.

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