Program and Abstract Booklet

The 4th International Conference on Advanced Technology & Applied Sciences (ICaTAS'2019)

Organized by

Arab Academy for Science, Technology and Maritime Transport (AASTMT)
Cairo Campus, Cairo, Arab Republic of Egypt

and

Malaysia Japan International Institute of Technology (MJIIT), University Teknologi Malaysia (UTM)

10-12 September 2019, AASTMT
AASTMT, Tolip Golden Plaza Hotel, Cairo, Egypt

The 4th International Conference on Advanced Technology & Applied Sciences (ICaTAS'2019)

Under the Auspices of

Prof. Mostafa Kemal Madbouly
Prime Minister of Egypt

Honor Chairs

Prof. Ismail Abdel Ghafar Ismail Farag
President of Arab Academy for Science, Technology and Maritime Transport (AASTMT)

Prof. Datuk Ir. Dr. Wahid Omar
Vice Chancellor of University Teknologi Malaysia (UTM)

Conference Chairs

Prof. Khaled Shehata
Dean of College of Engineering, AASTMT Cairo

Prof. Ali Selamat
Dean of Malaysia Japan International Institute of Technology, MJIIT, UTM, Malaysia

10-12 September 2019, AASTMT
AASTMT, Tolip Golden Plaza Hotel, Cairo – Cairo

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ICATAS 2019

Conference Program

ICaTAS' 2019 Program Summary

AASTMT Tolip Golden Plaza Hotel, Cairo, Egypt

Tuesday, September 10th, 2019

9:00 – 10:00	**REGISTRATION**		
10:00 –11:00	**OPENING CEREMONY**		
11:15 –12:00	**Keynote Speech (1):** ***Block-chain Revolution: New opportunities, Applications and Shaping the Future of Fourth Industrial Revolution -Future Directions*** *By: Prof. Eva Maria Kühn* *University of Technology (TU Wien), Vienna, Austria* **Main Hall (Verona)**		
12:00 –12:45	**Keynote Speech (2):** ***From Earth to Mars: Changing the Landscape of Technology*** *By: Associate Prof. Dr. Norhazilan Bin Md. Noor* *Universiti Teknologi Malaysia (UTM), Johor, Malaysia* **Main Hall (Verona)**		
12:45 – 13:30	**BREAK**		
13:30 –15:00	***Session 1*** *Optical Communications and Devices*	***Session 2*** *Antenna and Radar: Design and Applications*	***Session 3*** *BioImaging and BioSignals*
	Room (A) - (Verona)	**Room (B) - Palermo**	**Room (C) - Roma**
15:00 –16:30	***Session 4*** *Signal Processing and Machine Learning*	***Session 5*** *Encryption & Secure Communications*	***Session 6*** *Mechanical Engineering*
	Room (A) - (Verona)	**Room (B) - Palermo**	**Room (C) - Roma**
16:30 – 17:00	**LUNCH**		

Wednesday, September 11rd, 2019

9:30 – 10:15	**Invited Speech** ***Computational Cerebrovascular Hemodynamics: Recent Advances and Current Trends*** *By: Khalid M. Saqr, Ph.D.* *Department of Mechanical Engineering, Arab Academy for Science, Technology & Maritime Transport, Abu Qir, Alexandria* **Main Hall (Verona)**		
10:15 –11:00	**Technical Session:** ***How artificial intelligence and modern academic sciences positively affecting major industry project's?*** *By: Mr. Mahmoud Abou el-Quasem* *Chairman of Smart Oil Services Company, Egypt* **Main Hall (Verona)**		
11:00 – 11:30	**BREAK**		
11:30–13:00	**Session 7** *Optimization Applications*	**Session 8** *Communication Systems*	**Session 9** *Applied Science*
	Room (A) - (Verona)	**Room (B) - Palermo**	**Room (C) - Roma**
13:00 –14:30	**Session 10** *Computer & Information Technology*	**Session 11** *5G and MIMO Systems*	**Session 12** *Microstrip Antennas*
	Room (A) - (Verona)	**Room (B) - Palermo**	**Room (C) - Roma**
14:30 – 15:30	**CLOSING CEREMONY** **Main Hall (Verona)**		
15:30 – 16:30	**LUNCH**		

ICaTAS'2019 Technical Program

Tuesday, September 10th, 2019

INVITED KEYNOTE SPEAKERS SESSIONS

11:15 – 12:00

Keynote Speech I

Main Hall

Chair: ***Prof. Khaled Shehata***

Block-chain Revolution: New opportunities, Applications and Shaping the Future of Fourth Industrial Revolution -Future Directions

Prof. Eva Maria Kühn

University of Technology (TU Wien), Vienna, Austria

12:00 – 12:45

Keynote Speech II

Main Hall

Chair: ***Prof. Ali Salemat***

From Earth to Mars: Changing the Landscape of Technology

Associate Prof. Dr. Norhazilan Bin Md. Noor

Universiti Teknologi Malaysia (UTM), Johor, Malaysia

13:30-15:00

Session 1

Room (A) Optical Communications and Devices

Chair: ***Prof Moustafa Hussien***

Co-Chair: ***Prof. Moawad El Dosoky***

31 The Effect of Source and Drain Pocketing on the Performance of Double-Gate Tunnelling
Muhammad Elgamal

52 On-Board and Train-to-Wayside Free Space Optical Link: Design and Characterization
Ahmed F. Hussein, Abd El Aziz, Heba A. Fayed and Moustafa H. Aly

55 Sparse Indexed OFDM Modulation Technique For Visible Light Communication (VLC) With
Amgad F. Aziz, Omar A. M. Aly and Usama S. Mohammed

58 FWM Mitigation in DWDM Optical Networks
Habib Ullah Manzoor, Tareq Manzoor, Ashiq Hussain, Moustafa H. Aly

88 An efficient hybrid visible light communication/radio frequency system for vehicular applications
Marwa M. Abdel Momen, Heba A. Fayed, Moustafa H. Aly, Nour Eldin H. Ismail and M.A. Mokhtar

99 Transmission of 128 Gb/s Optical QPSK Signal over FSO Channel under Different Weather Conditions and Pointing Errors
Mai Adel, Hussein Seleem, Mohamed Nasr and Heba Khotby

103 Solar cell performance enhancement with optimized CIGS absorber bandgap and buffer layer
Yasmina Osman, Mostafa Fedawy, Mohamed Abaza and Moustafa H. Aly

13:30-15:00

Session 2

Room (B) Antenna and Radar :Design and Applications

Chair: ***Prof. Mohamed Hasan***

Co-Chair: ***Dr. Saleh Eisa***

8 A Wearable Flexible antenna integrated on a Smart Watch for 5G Applications

Mohamed Ahmed and Mai Ahmed

9 Design and Fabrication of Multi-band Wearable Fractal Antenna for Telehealth Applications

Mohamed Ahmed and Mai Ahmed

30 Electromagnetic Simulation of Volume Scattering for Monitoring the Height of Natural Grass

S A M Soliman, A E Farahat, K F A Hussein, A A Ammar

38 Effect of phase noise on two-angle DoA estimation using planar arrays

Asmaa Farahat and Khalid Hussein

63 High gain steerable antenna with different substrate materials for satellite applications

Mohamed Wady, Wael Swelam and Mohamed Abdel Azeem

71 Characteristics of Electromagnetic Scattering from Vegetation Models using Random Wire Structures with Applications to Land Imaging SAR Systems

Shimaa Soliman, Khalid Fawzy and Abd-El-Hadi Ammar

85 Broadband Printed-Dipole Antenna for 4G/5G Smartphones

Manar Khalifa, Lamia Khashan, Hesham Elbadawy and Fawzy Ibrahim

13:30-15:00

Session 3

Room (C) BioImaging and BioSignals

Chair: ***Prof. Sherin Youssef***

Co-Chair: ***Prof. Sahar Fawzy***

3 A Web-based blood donation and Medical Monitoring System

Mohamed Nabil, Rowan Ihab,Heba El Masry, Sandra Said, Sherin Youssef

7 Design and Implementation of an SPO2 Based Sensor for Heart Monitoring Using an Android Application

Radwa Sameh, M. Genedy, A Abdeldayem, Mohamed H. Abdel azeem

15 Eye Diseases Monitoring Using Statistical Analysis of Disc Topography and RNFL Circular

Safaa Makram Mohamed, Ashraf Ali Wahba and Mohamed Ali Ahmed Eldosoky

20 Arrhythmia Disease Classification and Mobile Based System Design

Soha S. AbdElMoneem, Hany H. Said, and Amani A. Saad

61 A Study on Biological Sample Preparation for High Resolution Imaging of Scanning Electron Microscope

Siti Rahmah Aid, Nik Nur Anis Awadah Nik Zain, Nur Nadhirah Mohd Rashid, Hirofumi Hara, Kamyar Shameli, and Iwamoto Koji

15:00-16:30

Session 4

Room (A) Signal Processing and machine learning

Chair: ***Prof. Rubiyah Yusof***

Co-Chair: ***Prof . Mohamed El Mahallawy***

18 Staging of clear cell renal cell carcinoma using random forest and support vector machine

Doha Talaat, Fatma Zada and Rania Kadry

36 Multi-class Image Classification Using Deep Learning Algorithm

Wael Ahmed Ezat, Mohamed Moawad and Nabil Abdelwahid Ismail

40 Image Segmentation and Verification Based on Machine Learning for Vision Inspection of Chicken Slaughtering

Rubiyah Yusof, Reza Arfa, Muhd Ridzuan Muhd Yunus, Nor Aziah Amirah Nor Muhammad, Nenny Ruthfalydia Rosli and Nordinah Ismail

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Taher Ahmed Abouel Kassem, Mohamed E. Tamazin and Moustafa H. Aly

76 Towards Multi Robot Task Allocation and Navigation using Deep Reinforcement Learning

Ahmed Elfakharany, Rubiyah Yusof and Zool Ismail

15:00-16:30

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Room (A) Encryption & Secure Communications

Chair: ***Prof. Mohamed Nasr***

Co-Chair: ***Prof. Hanady Hussien***

12 A novel approach of image encryption using pixel shuffling

Arwa Benlashram, Maryam Al-Ghamdi, Rawan AlTalhi and Pr. Kaouther Laabidi

74 Detecting spam campaign in twitter with semantic similarity

Mohamed Mostafa Elsaied, Amira Abdelwahab and Hatem Mohammed Sayed

94 Simplified Hybrid Secure Algorithm for Mobile Banking Application

Roayat Ismail Abdelfattah, Sherif Awad and Mohamed Nasr

97 Secure Image Encryption Scheme Based on DNA and New Multi Chaotic Map

Roayat Ismail Abdelfattah, Hager Mohamed and Mohamed E Nasr

98 Open Challenges in Internet of Things Security

Ali Selamat and Zeinab Iqal

100 Discovering Hate Sentiment within Twitter Data through Aspect-Based Sentiment Analysis

Nurulhuda Zainuddin, Ali Selamat and Roliana Ibrahim

15:00-16:30

Session 6

Room (B) Mechinical Engineering

Chair: ***Prof. Mostafa Rostom***

Co-Chair: ***Dr. Norhuda Abdul Manaf***

25 Improved Position Estimation of Real Time Integrated Low-Cost Navigation System Using Unscented Kalman Filter

Abdalla Eldesoky, Ahmed Hamed and Ahmed M. Kamel

65 Efficient Linearized Model of Pressurizer System in Pressurized Water Reactors for Control Purposes

Amal A. Sheta, Elsayed H. Ali, Refaat M. Fikry, Tarek A. Mahmoud, Sayed M. El-Araby and Mohammed I. Mahmoud

67 Dynamic modelling and simulation of clean coal power generation

Norhuda Abdul Manaf and Ali Abbas

107 Enhancing the Design of Arthroscopic Shaver to Reduce Stresses Experienced

Nader Hafez, Mi El-Anwar and Mostafa R. A. Atia

Wednesday, September 11th, 2019

9:30 - 10:15

INVITED TALK

Main Hall

Chair: ***Prof. Adel Belal***

Computational Cerebrovascular Hemodynamics: Recent Advances and Current Trends

Dr. Khalid M. Saqr

Department of Mechanical Engineering, Arab Academy for Science, Technology & Maritime Transport, Abu Qir, Alexandria

10:15 - 11:00

INDUSTRIAL SESSION

Main Hall

Chair: ***Prof. Mohamed hasan***

How artificial intelligence and modern academic sciences positively affecting major

Mahmoud Abou el-Quasem

Chairman of Smart Oil Services Company, Egypt

11:30 - 13:00

Session 7

Room (A) Optimization Applications

Chair: ***Prof. Noha Elamary***

Co-Chair: ***Dr. Uswah Khairuddin***

39 Optimal Distributed Generation Allocation and Sizing Using Genetic and Ant Colony Algorithms

Yousef Y. Zakaria, R. A. Swief, Noha H. El-Amary, Amr M. Ibrahim

54 Enhancing the quantum cost of Reed-Muller Based Boolean quantum circuits using genetic algorithms

Mohamed Shaban, Ahmed Younes and Ashraf Elsayed

70 Smart Packing Simulator for 3D Packing Problem Using Genetic Algorithm

Uswah Khairuddin, Nur Amalin Zahra Mohd Razi, Mohd Shahril Zainol Abidin and Rubiyah Yusof

80 MANET's Energy Consumption using modified Integer Linear Programming and modified Ant-Colony Optimization Algorithms

Mohamed Ashraf, Ben Bella Tawfik, Sherif El-Diasty and Mohamed Hassan

84 LNA Design Optimization Using DNA Computing

Roshdy Abdelrassoul, Abd El-Menem Abd El-Bary and Aya El-Ebshihy

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Room (B) Communication Systems

Chair: ***Prof. Hesham Elbadawy***

Co-Chair: ***Assoc. Prof. Hussien Elattar***

22 Optimum Polar Codes Encoder over Binary Discrete Memory-less Channels

Ahmed H. El-Sakka, Karim H. Moussa, and Shawki Shaaban

64 Design of X-Band Low Noise Amplifier For Radar Applications

Mohammed Abdelhakeem, Saleh Eisa, Khaled Shehata and Hani Fekry

68 Low Complexity Viterbi Decoder for RSCC Concatenated Codes

Ramy Samy and Ashraf Mahran

73 Energy Efficiency Improvement in Mobile Communication System by Reducing the PAPR

Sara Mahmoud Farid Ahmed, Khaled Shehata and Hesham Elbadawy

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Chair: ***Prof. Samir Yousief***

Co-Chair: ***Dr. Nurfatehah Wahyuny Che Jusoh***

5 Barycentric Lagrange interpolation for solving Volterra integral equations of the second kind

Emil Shoukralla, Hany Elgohary and Basma Magdy

6 Numerical Solutions of Volterra Integral Equations of the Second Kind using Lagrange interpolation via the Vandermonde matrix

Emil Shoukralla and Basma Magdy

66 Self-Cleaning and Hydrophobic Pineapple Peel Fibre based Biocomposite

Roshafima Rasit Ali, Solehah Mohd Raffae, Jesbains Kaur, Norazana Ibrahim, Rafiziana Md Kasmani, Hasrinah Hasbullah and Nurfatehah Wahyuny Che Jusoh

86 Waste Tire Carbon Adsorbent for Active Removal of Paracetamol in Aqueous Solution

Nurfatehah Wahyuny Che Jusoh, Choo Tzy Yeng, Ahmad Masudi and Roshafima Rasit Ali

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Room (A) Computer & Information Technology

Chair: ***Prof. Nancy Diaa***

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10 Performance Analysis and Evaluation of Software Defined Networking Controllers against Denial of Service Attacks

Ahmed F Abdullah, Fatty M Salem, Ashraf Tammam, and Mohamed H Abdel Azeem

35 A Cloud-based GIS System for Enterprise Spatial Collaborative Platform

Osama Saber , Salleh Mesbah , and Khalid Eldrandaly

49 Enhanced Ontology Matching for Big Data Integration

Nesma Mahmoud, and Hatem M. Abdlkader

77 Parallel implementation for ECCP based on Montgomery ladder algorithm

Shaimaa Abu Khadra, Salah Eldin Abdulrahman and Nabil A. Ismail

79 Enhanced Parallel Outlier Detection Technique for Time Series Data

Ahmed Farag, Rashed Salem and Hatem Abdelkader

87 Feedback Recommendation System Based on Structured Feedback Acquisition

Ehsan Hassan, Nada Sherief, Walid Abdelmoez and Amani Saad

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Room (B) 5G and MIMO Systems

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Co-Chair: ***Prof. Salah Elagoz***

24 Performance Analysis of MIMO-NOMA Systems Based on Dynamic User Pairing Scheme

Shady A Deraz, Karim H Moussa, Mohamed R M Rizk and Shawky Shaaban

41 A Novel Dual-Band 28/38 GHz AFSL MIMO Antenna for 5G Smartphone Applications

H M Marzouk, M I Ahmed, and A A Shaalan

42 Power Allocation in 5G mmWave Networks with Massive MIMO and Block Diagonalization

M S Fikry,S Shaaban ,N Esmail and M Abdelkarim

48 Performance Assessment for Energy Efficient NOMA over Nakagami Fading Channel

Ahmed Al-Masry, Hesham ElBadawy and Fawzy Ibrahim

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Chair: ***Prof. Mohamed Aboul Dahab***

Co-Chair: ***Prof. Yahya Mehaseb***

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May Abo El-Hassan, Khalid Hussein and Kamal Awadalla

17 Design and Implementation of different unit cell elements for reflect arrays

Mohamed Fathy, Muhammad Aly and Abdelmegid Allam

19 Dual-Band Circularly Polarized Mobile Antenna for Millimeter-Wave Antenna Applications

F I Alnemr, M F Ahmed and A A Shaalan

27 Circularly Polarized Flat-Topped Beam Using Concentric Circular Arrays of Microstrip Patches

M Abo El-Hassan, K F A Hussein, A E Farahat1 and K H Awadalla

57 Millimetre four-element microstrip aperture-coupled array for 5G wireless communication systems

F. Sheeren, J. Osama, M. Ihab1, M. Tharwat, L. Adel, L. Khashan

81 Design and Implementation of 32 element Microstrip Array Antenna for Ku–Band Satellite application

Mohamed Hassouna, Wael Swelam and Mohamed Abdel Azeem

Keynote Speakers

Professor Eva Maria Kühn,

Vienna University of Technology (TU Wien), Vienna, Austria

- Head of Space Based Computing, Vienna University of Technology (TU Wien)
- Senior Member of the Governing Board of the Austrian and European UNIX Systems Group
- Chair of the Strategic Board of the SCCH (Software Competence Center Hagenberg at JKU Linz)
- Senior Member of the Scientific Advisory Board of the SCCH.
- Achieved many International Software Patents for Research work on a New "Coordination
- Systems" from USA Patent, European Patent and Oesterreichisches Gebrauchsmuster.

Prof. Eva Maria Kühn is the Head of Space Based Computing, Vienna University of Technology (TU Wien), Vienna, Austria. She is a graduated engineer of computer sciences (Dipl. Ing.), Ph.D. (Dr. techn.) and Venia Docendi (Univ. Doz.) from the TU Wien. Heinz-Zemanek Research Award for Ph.D. work on "Multi Database Systems". Kurt-Gödel Research Grant from the Austrian Government for a sabbatical at the Indiana Center for Databases at Purdue University, USA. Received the INiTS Award on a "Shared Virtual Space Distribution Manager- SVSDM. She has more than 400 International publications and innovation awards in the areas of methods and tools for software development, software engineering, coordination languages, software integration, parallel and distributed programming, heterogeneous transaction processing, and space-based computing. She is a project coordinator of nationally (FWF, FFG, AT), internationally (EU Commission) funded research projects, and projects with industry. She achieved many International software patents for research work on a new "Coordination Systems" from USA Patent Agent, European Patent and Oesterreichisches Gebrauchsmuster. Seven years of management experience as Chief Technological Officer (CTO) of an Austrian Spin-Off company for software development. She has been Nominated among the top 1000 Austrian Managers, Business People, the Highest-Interest-Magazine of the Wirtschaftsblatt (place 14, Category So=ware). Senior Member of the Governing Board of the Austrian and European UNIX systems user group.

Member of the ISO Working Group for the standardization of Prolog. Chair of the Strategic Board of the SCCH (Software Competence Center Hagenberg at JKU Linz). Senior Member of the Scientific Advisory Board of the SCCH. Conference chair, program committee member, organizer and coordinator of many international conferences. Senior Member of the Senate of the Christian Doppler Forschungsgesellschaft (CDG). Senior Member of the Science and Research Council of the Federal State of Salzburg. Her research interest lies in the areas of Software development for concurrent and distributed systems, space based computing, Coordination for embedded systems, Agile, distributed and open software architectures, Peer-to-Peer Systems and Algorithms, Software systems integration, Self-organizing/ Bio-inspired Systems and algorithms, Asynchronous and distributed Replication Strategies, Heterogeneous Transaction models, and Blockchain Application platforms

Associate Prof. Dr. Norhazilan Bin Md. Noor

Universiti Teknologi Malaysia (UTM), Johor, Malaysia

- Deputy Dean of Continuing and Transnational Education of Faculty of Engineering
- Deputy Director of Construction Research Centre
- Editor-in-Chief of Malaysian Journal of Civil Engineering

PhD (Reliability Assessment) holder from Heriot-Watt University, Edinburgh, Scotland and now serves as Associate Professor at Department of Structure and Material, School of Civil Engineering, Universiti Teknologi Malaysia. Currently, he holds the position of Deputy Dean of Continuing and Transnational Education of Faculty of Engineering and Deputy Director of Construction Research Centre. His research area focuses more on development of soil-corrosion model for tropical region, probabilistic-based reliability assessment software for pipeline integrity management, risk assessment approach for deteriorating infrastructure, non-physical inhibitor for mitigating microbial-influenced corrosion and new material for pipeline repair. He is the recipient of Special Award for Innovation in 2013 by the Malaysian Construction Industry Excellence Award Committee. He has gathered more than 30 major awards locally and internationally for his contribution in research, teaching and administration.

Dr. Khalid M. Saqr

Arab Academy for Science Technology & Maritime Transport (AASTMT), Alexandria, Egypt

- Specialized in computational fluid dynamics (CFD)
- Received the honorary affiliation of the African Academy of Sciences in 2018
- Visiting professor with the Institute of Fluid Science, Tohoku University, Japan
- Co-founded the Research Center for Computational Neurovascular Biomechanics (RCCNB) in collaboration with Alexandria University and the Egyptian Science and Technology Development Fund

Dr Saqr was born in Alexandria, Egypt in 1982. He received B.Sc. and Ph.D. in mechanical engineering from Alexandria University and Universiti Teknologi Malaysia in 2004 and 2011, respectively. Dr. Saqr is specialized in computational fluid dynamics (CFD). He has published more than 80 papers in international journals and conferences covering a broad spectrum of the theory and applications of CFD including turbulence modelling, combustion dynamics, renewable energy and most recently intracranial hemodynamics. Dr. Saqr received international recognition for his research from several organizations and universities around the world. He received the honorary affiliation of the African Academy of Sciences in 2018. He has been a visiting researcher, then a visiting research fellow and invited lecturer with UTM, Malaysia, from 2012 to 2014. He regularly receives the Distinguished Publications Award from the Arab Academy for Science, Technology and Maritime Transport every year since 2014. Most recently, Dr. Saqr has been a visiting professor with the Institute of Fluid Science, Tohoku University, Japan in the summer of 2017. Since 2010, his biography is listed in Marquise Who's Who® biographical dictionary. In 2017, Dr. Saqr received the Albert Nelson Marquis Lifetime Achievement Award for his scientific achievements in the past ten years. Along with international recognition, Dr. Saqr has contributed efficiently to the national research priorities of Egypt. He was nominated for Egypt's most prestigious scientific award, State Encouragement Award, for his works on the applications of CFD in modeling renewable energy systems. Dr. Saqr co-founded the Research Center for Computational Neurovascular Biomechanics (RCCNB) in collaboration with Alexandria University and the Egyptian Science and Technology Development Fund. RCCNB is the first nationwide research center specialized in vascular biomechanics with a primary objective to contribute to the brain stroke research in Egypt. Now, Dr. Saqr leads the CFD team at RCCNB to develop anatomically accurate CFD simulations of blood flow in intracranial blood vessels. In addition to his academic and research endeavours, Dr. Saqr is proactive in providing consultancy in the fields of research management and simulation systems on the national and regional levels.

Eng. Mahmoud Abou El-Quasem,

The chairman of Smart Oil Services Company, Egypt

- A petroleum engineer with 35 years of experiences in oil and gas explorations and production operations
- He was directly hired in top international oil companies in the world since 1988.
- He participated in overseas technical and managerial oil and gas Explorations & Production job posting's and projects.
- 15 years working with Amoco-BP oil companies operating units.
- 17 years working with Royal Dutch Shell Company and projects.

A petroleum engineer with 35 years of experiences in oil and gas explorations and production operations. Mahmoud was directly hired in top international oil companies in the world since 1988th. During work journey, he worked 15 years worked for Amoco-BP oil companies operating units and 17 years worked for Royal Dutch Shell Company and projects. Mahmoud is currently a chairman of smart oil Services Company in Egypt. He participated in overseas technical and managerial oil and gas Explorations & Production job posting's and projects in USA_ Houston, The Netherlands _Rijswijk Shell oil company headquarter, in Sultanate of Oman, Iraq, UAE _ Abu Dhabi & Dubai, Qatar_ Northern gas field, Russia _ Sakhalin, France Total projects in Cameron, Algeria, Libya, Iran, Kuwait and Egypt (Amoco).

ABSTRACTS

ID 3 - A Web-based blood donation and Medical Monitoring System Integrating Cloud services and Mobile Application

Mohamed Nabil, Rowan Ihab,Heba El Masry, Sandra Said, Sherin Youssef

ABSTRACT

Medical monitoring requires instant visibility across data sources and access to dynamic analyses. However medical monitoring among patients, perform in-stream medical advice, remains a challenging problem. Blood banks suffer frequent shortage of blood due to lack of blood donations, hence blood donation requests are frequently seen on social media for patients who urgently require blood transfusion with specific blood group. Recently, worldwide efforts have been undertaken to utilize social media and smart phone applications to make the blood donation process more convenient and provide a concrete information system that allows donors and blood donation centers to communicate efficiently and coordinate with each other to minimize time and effort required for blood donation process. This paper aims at developing a Cloud medical monitoring and Web-Based Blood Donation System which will allow blood donors and patients to offer/request blood donation from blood banks. Additionally, a new method is proposed for continuous observation and communication among doctors and patients. Using IOT cloud platform, simple medical devices equipped with medical sensors can monitor health status of patients and update the electronic medical records of patients' information. Medical experts can remotely monitor patients dynamic status and give prompt medical advice. The developed Web-Based application utilizes a cloud based hosting platform to enhance system performance and ensure high availability. A mobile application has been developed where users will be able to use as an application installed on their smart phones to help them complete blood donation process with minimum effort and time. This application helps people receive remotely medical advices and helps establish a blood donation community through social networks. This paper also presents various tools that were used to measure system performance.

ID 5 - Barycentric Lagrange interpolation for solving Volterra integral equations of the second kind

Emil Shoukralla, Hany Elgohary and Basma Magdy

ABSTRACT

An improved version of Barycentric Lagrange interpolation with uniformly spaced interpolation nodes is established and applied to solve Volterra integral equations of the second kind. The given data function and the unknown functions are transformed into two separate interpolants of the same degree, while the kernel is interpolated twice. The presented technique provides the possibility to reduce the solution of the Volterra equation into an equivalent algebraic linear system in matrix form without any need to apply collocation points. Convergence in the mean of the solution is proved and the error norm estimation is found to be equal to zero. Moreover, the improved Barycentric numerical solutions converge to the exact ones, which ensures the accuracy, efficiency, and authenticity of the presented method.

ID 6 - Numerical Solutions of Volterra Integral Equations of the Second Kind using Lagrange interpolation via the Vandermonde matrix

Emil Shoukralla and Basma Magdy

ABSTRACT

A new method is established for solving Volterra integral equations of the second kind using Lagrange interpolation through the Vandermonde approach. The goal is to minimize the interpolation errors of the high-degree polynomials on equidistance interpolations by redefining the original Lagrange functions in terms of the monomial basis. Accordingly, the complexity of the calculations is significantly reduced, and time is saved. To achieve this, the given data and the unknown functions are interpolated using Lagrange polynomials of the same degree via the Vandermonde matrix. Moreover, the interpolant unknown function is substituted twice into both sides of the integral equation so that the solution is reduced to an equivalent matrix equation without any need to apply collocation points. The error norm estimation is proved to be equal to zero. It was found that the obtained Vandermonde numerical solutions were equal to the exact ones, the calculation time was remarkably reduced, the round-off error was significantly reduced and the problematics due to the high-degree interpolating polynomial was completely faded regardless of whether the given functions were analytical or not. Thus, interpolation via the Vandermonde matrix ensures the accuracy, efficiency and authenticity of the presented method.

ID 7 - Design and Implementation of an SPO2 Based Sensor for Heart Monitoring Using an Android Application

Radwa Sameh, M. Genedy, A Abdeldayem, Mohamed H. Abdel azeem

ABSTRACT

The heart is one of the most vital organs in the human body therefore; its wellbeing and health are monitored continuously to determine the medical conditions of patients. The current paper presents a heart rate measuring device, which can also be used to measure oxygen saturation levels, and body temperature. All measured results have been analyzed by an Arduino platform to decide the patient's health status. The obtained measurements were also monitored using an in-house mobile application with an integrated alarm system acquainted by both the therapist and patient. The design of this device is dependent on many types of platforms such as Arduino, Android and cloud server. This device can help the patients to check their health status and provide a suggested course of action.

ID 8 - A Wearable Flexible antenna integrated on a Smart Watch for 5G Applications

Mohamed Ahmed and Mai Ahmed

ABSTRACT

This paper present a design of dual band flexible wearable antenna for modern 5G applications to integrate on a smart watch. This antenna is a rectangular antenna which the patch and the ground etched on a new flexible material is called "ULTRALAM® 3850HT". This material is characterized by thin flexible cores with low and stable dielectric constant, which is a key requirement for high frequency and wearable designs. The dielectric constant εr is equal 3.14, and loss tangent tanδ is equal 0.005 of the ULTRALAM® 3850HT flexible material. The presented antenna is designed to operate at 38 GHz and 60 GHz. The SAR (specific absorption ratio) is also introduced and SAR results will be shown. The presented antenna with and without the smart watch are simulated using HFSS and CST 2018.

ID 9 - Design and Fabrication of Multi-band Wearable Fractal Antenna for Telehealth Applications

Mohamed Ahmed and Mai Ahmed

ABSTRACT

In this paper, a Multi-band Wearable Fractal Antenna is fabricated for Telehealth Applications. The projected antenna substrate is made from a flexible Jeans textile material. The dielectric properties of this textile can be measured by two different methods. Also, a folded copper tape is used to fabricate the projected wearable antenna. Further, the projected antenna under the bent conditions is studied in details. The specific absorption ratio (SAR) is also studied in this paper. The projected antenna is simulated by CST simulator version 2018 and measured by Agilent8719ES VNA. Finally, there is a large convergence between the measured and the simulation results.

ID 10 - Performance Analysis and Evaluation of Software Defined Networking Controllers against Denial of Service Attacks

Ahmed F Abdullah, Fatty M Salem, Ashraf Tammam, and Mohamed H Abdel Azeem

ABSTRACT

The Software defined networking (SDN) utilization within networking architecture represents a way of looking at how networks are configured, controlled, and operated. Managed services such as routing, load balancing, and security can be automated and centralized dynamically in SDN controllers. Controllers act as the centralized repository of policy and control instructions for the network that packets are transmitted through it. Any transmitted packets flooded from an attacker that intends to access the controller will result to Denial of Service (DoS) attack. Thus, this paper is devoted to simulate and examine the impact of DoS attack on the bandwidth of two different linked hosts (Server/client) by SDN controllers as POX, RYU, and Opendaylight (ODL) controllers. The network performance is tested and emulated by using different testing tools of simulation in Mininet such as Hping3, iperf, jperf, wireshark and miniedit. Also, the performances of the controllers against DoS attack proposed by different protocols using user datagram protocol (UDP) and transmission control protocol (TCP) which will be assess via OpenFlow switch.

ID 11 - Circularly Polarized Planar Antenna Array Using Linear Polarized Microstrip Antenna with Beamforming for SAR Applications

May Abo El-Hassan, Khalid Hussein and Kamal Awadalla

ABSTRACT

Circular polarization is so important for satellite and SAR applications. Therefore, a relatively large planar array of 10 ´ 10 building blocks is proposed to get a high gain and to have the possibility of beamforming for such applications. The individual antenna element used in this array is a linear u-slotted microstrip patch. This allows for simplicity, lightweight and low cost. At first, a subarray of these microstrip antennas is constructed and analyzed to become a building block for the large array. This subarray is formed of four u-slotted microstrip antenna elements arranged in a cross form with 90° sequential rotation in orientation in space, and 90° sequential phase shift between adjacent microstrip elements. The distance between the centers of two opposite microstrip elements is selected to be 0.53l0. A linear array is formed of ten of these subarrays and analyzed to become one row or one column in the final planar array. The distance between subarray centers is kept to be 0.53l0, which implies a new arrangement technique using the superposition of elements of the adjacent subarrays. The phase and amplitude relations of this linear array are developed for beamforming using the particle swarm optimization algorithm. Finally, the planar array is formed and simulated. It also implies using the superposition theorem to get the final array form. This planar array has proved to produce a cosecant-squared radiation pattern in the f = 0° plane normal to the array plane, and a flat-topped pattern in the other perpendicular plane of f = 90°. This type of array is very suitable for SAR side looking applications.

ID 12 - A novel approach of image encryption using pixel shuffling and 3D chaotic map

Arwa Benlashram, Maryam Al-Ghamdi, Rawan AlTalhi and Pr. Kaouther Laabidi

ABSTRACT

In recent years, with rapid development in information and communication technologies, sharing digital images in social media have facilitated. However, since images privacy matters in our society, keeping images protected became a big challenge we have to deal with. In this paper, we propose a new image encryption method using Image Pixel Shuffling and 3D Chaotic map. First, the plain image is encoded using pixel shuffling, then the result is XORed with a key, and finally, the 3D chaotic map is performed on it. The security will be increased by using three steps to encrypt the image. Our results show that the proposed approach has a good performance and it is better than those of some notable image encryption algorithms. We got average entropy 7.9901 of cipher image, NPCR of 99.6572%, and UACI of 33.6538%. MATLAB was used to implement the proposed image encryption approach.

ID 15 - Eye Diseases Monitoring Using Statistical Analysis of Disc Topography and RNFL Circular Tomogram Parameters

Safaa Makram Mohamed, Ashraf Ali Wahba and Mohamed Ali Ahmed Eldosoky

ABSTRACT

In this paper, Statistics method for data taken from ophthalmology institute of Cairo, Egypt used to pinpoint the absolute measurement precision of high resolution technique of Topcon three dimensional optical coherence topography FA plus (Topcon 3D OCT FA plus) parameters by expressing them as limit of agreement percentage (LA95%) then, suggest a method for mathematically evaluating the ability of parameter to monitor ailment progression expressed as Discriminate Capacity Index (DCI) then, select parameters suitable for both conversion to glaucoma and modify to outright glaucoma . The used Parameters were area of disc, cup, rim and cup to disc ratio, linear and veridical cup to disc ratio, volume of cup, rim volume, horizontal and vertical diameter, total thickness of retinal nerve fiber layer (RNFL), average superior thickness of RNFL and average inferior thickness of RNFL parameters have been arranged with a DCI $\geq$ 0.4 for glaucoma detection and with a DCI$\geq$ 2.3 for continue of glaucoma. The most adequate parameters for both detection and follow-up of glaucoma are Inferior thickness of RNFL (DCI=4.1976), total thickness of RNFL (DCI=16.56) and vertical cup- to- disc ratio (CDR) (DCI=22.1875).

ID 17 - Design and Implementation of different unit cell elements for reflect arrays

Mohamed Fathy, Muhammad Aly and Abdelmegid Allam

ABSTRACT

This paper presents the design and analysis of a unit cell reflect array element using different shapes of radiating elements. A circular split ring and a compliment split ring using different sizes of patches and substrates are proposed. Moreover, a square patch with a varying length stubs is introduced. Each unit cell design is set to operate in the millimetre frequency band to support the 5G standards. In order to conduct those studies, commercially available computer models of CST Microwave studio is used. The scattering properties of the unit cell elements are investigated using Floquet technique based on assumption that the unit cell element is made of infinite periodic structure. For each resonant element, the return loss and the reflection phase graphs are being analysed to obtain the optimum reflection of power and to cover360 degrees phase shift.

ID 18 - Staging of clear cell renal cell carcinoma using random forest and support vector machine

Doha Talaat, Fatma Zada and Rania Kadry

ABSTRACT

Kidney cancer is one of the deadliest types of cancer affecting the human body. It's regarded as the seventh most common type of cancer affecting men and the ninth affecting women. Early diagnosis of kidney cancer can improve the survival rates for many patients. Clear cell renal cell carcinoma (ccRCC) accounts for 90% of renal cancers. Although the exact cause of the kidney cancer is still unknown, early diagnosis can help patients get the proper treatment at the proper time. In this paper, a novel semi-automated model is proposed for early detection and staging of clear cell renal cell carcinoma. The proposed model consists of three phases: segmentation, feature extraction, and classification. The first phase is image segmentation phase where images were masked to segment the kidney lobes. Then the masked images were fed into watershed algorithm to extract tumor from the kidney. The second phase is feature extraction phase where gray level co-occurrence matrix (GLCM) method was integrated with normal statistical method to extract the feature vectors from the segmented images. The last phase is the classification phase where the resulted feature vectors were introduced to random forest (RF) and support vector machine (SVM) classifiers. Experiments have been carried out to validate the effectiveness of the proposed model using TCGA-KRIC dataset which contains 228 CT scans of ccRCC patients where 150 scans were used for learning and 78 for validation. The proposed model showed an outstanding improvement of 15.12% for accuracy from the previous work.

ID 19 - Dual-Band Circularly Polarized Mobile Antenna for Millimeter-Wave Antenna Applications

F I Alnemr, M F Ahmed and A A Shaalan

ABSTRACT

In this paper, a dual-band circularly polarized truncated corner microstrip antenna is simulated and fabricated to operate over millimeter wave frequencies for modern mobile applications. The propose antenna is designed as monolayer circularly polarized patch antenna fed by single-fed strip-line that has been taken to provide better resonating frequency. Further, this antenna has a high gain to resist the losses in millimeter band. Also, the truncated corners and the L-shaped slots in the proposed antenna have a big effect of the antenna performance. This proposed antenna is simulated by CST 2016. Also, the experimental results are measured by R&S®ZVA67 VNA (Vector Network Analyzer). Finally the measured and simulated results are more closed to each other.

ID 20 - Arrhythmia Disease Classification and Mobile Based System Design

Soha S. AbdElMoneem, Hany H. Said, and Amani A. Saad

ABSTRACT

Heart Rate Variability (HRV) is a measure of variation in the time interval between consecutive heart beats.HRV analysis is highly sensitive for risks linked with cardiovascular diseases which are main causes of death in Egypt and all over the Middle East. Early detection of cardiac arrhythmia diseases achieves effective treatment by making it easy to choose appropriate anti-arrhythmic drugs, also very important for improving arrhythmia therapy and preventing number of death in individuals. In this paper, an efficient cardiac arrhythmia detection algorithm is introduced. Different classifiers are deployed and examined on ECG signals. Various oversampling techniques are investigated to handle imbalanced dataset. The ensemble classifier; support vector machine and Random forest with random sampling show accuracy of 98.18 % in 0.145 sec which is the best accuracy among all other classifiers. In addition, this paper also proposes a mobile based system architecture integrated with the algorithm for diagnosis and classification of cardiac arrhythmia diseases. The proposed system can be easily used by patients to check their heart health remotely and easily.

ID 22 - Optimum Polar Codes Encoder over Binary Discrete Memory-less Channels

Ahmed H. El-Sakka, Karim H. Moussa, and Shawki Shaaban

ABSTRACT

In modern communication systems, there are increasing need for more capacity achieving coding schemes to fulfil high data rates demands. Polar codes are very promising candidates to achieve near Shannon's capacity and improved systems' reliability due to their polarized channel construction idea which depends on utilizing the good channel in data transmission and consumes the noisy ones in frozen bits transmission as pilots. This paper presented the performance of polar codes for binary erasure channel, binary symmetric channel, and additive white Gaussian noise channel at various rates and different design parameter to find the optimum ones for these channels. The numerical analysis showed that when the rate increased the system bit error rate performance degrades, while it is improved when the design parameters are optimized for all the studied channels.

ID 24 - Performance Analysis of MIMO-NOMA Systems Based on Dynamic User Pairing Scheme

Shady A Deraz, Karim H Moussa, Mohamed R M Rizk and Shawky Shaaban

ABSTRACT

Multiple-input multiple-output (MIMO) structure can enhance the total capacity of the modern communication systems without using consuming excess power or bandwidth. Non-orthogonal multiple access (NOMA) configuration is a good candidate to accommodate with MIMO structure to fulfil the demands to higher user data rates and improved spectral efficiencies. The dynamic uniform channel gain difference (DUCGD) user pairing technique plays an important role to maximise the capacity of all paired and served users. The DUCGD is performed by calculating the channel gain of every prospected user and sorting it in descending order to pair ones with the highest difference in channel gain together. In this paper, the performance analysis of MIMO-NOMA systems by means of DUCGD is presented. The numerical analysis showed that, the increasing of the number of users leads to increase the systems' gain in the total sum rates. Likewise, the enhanced gain in the total sum rates is improved due to using DUCGD and an increased number of transmitting and receiving antennas, jointly.

ID 25 - Improved Position Estimation of Real Time Integrated Low-Cost Navigation System Using Unscented Kalman Filter

Abdalla Eldesoky, Ahmed Hamed and Ahmed M. Kamel

ABSTRACT

Low cost Micro Electrical Mechanical Systems (MEMS) inertial sensors have nominated their use in domains such as navigation systems but these sensors are noisy and characterized by their measurements drift and large errors. In this work, an integrated navigation system is implemented and its performance is evaluated through experimental work in both post processing and real time domains. The real time processing is built on multi-platform 32-bit ARM core ATMEL microcontroller while at the same time raw sensors measurements are saved for post processing under MATLAB. North and East position errors measurements were used in this work to evaluate position improvement calculated using MEMS inertial sensors integrated with position and velocity from Global Positioning System (GPS) receiver readings at slow rates. For such evaluation, the calibrated measurements from gyroscopes and accelerometers are fed to a mechanization process to build an inertial navigation system (INS). The INS drifting navigation solution is fused with a GPS measurement through Unscented Kalman Filter (UKF). UKF does not require linearization of the system model such as the status of the commonly used Extended Kalman Filter (EKF). The results of the experimental work show that the implemented low cost integrated navigation system based on UKF can achieve a level of accuracy superior than other (EKF) based expensive systems.

ID 27 - Circularly Polarized Flat-Topped Beam Using Concentric Circular Arrays of Microstrip Patches

M Abo El-Hassan, K F A Hussein, A E Farahat1 and K H Awadalla

ABSTRACT

A circularly polarized flat-topped beam is synthesized by concentric circular arrays of microstrip patch antennas using the particle swarm optimization (PSO). The beam synthesis is performed by controlling only the magnitudes of excitation of the array elements where all the array elements are excited in phase. To get circularly symmetric radiation pattern, the elements on the same circle are fed with the same magnitude. The numerical investigations show that the obtained beam shape is very close to the desired one with almost no ripples on the flat top. The final antenna design show acceptable performance regarding the impedance matching, the axial ratio and the sidelobe level over the operating bandwidth of the array.

ID 30 - Electromagnetic Simulation of Volume Scattering for Monitoring the Height of Natural Grass using PolSAR Radar Vegetation Index

S A M Soliman, A E Farahat, K F A Hussein, A A Ammar

ABSTRACT

The present work proposes a new method for monitoring the natural grass height through the fully polarimetric synthetic aperture radar (PolSAR) data. For electromagnetic simulation, the grassland area is modeled as a cloud of random curly strips with high conductivity. The physical problem of electromagnetic scattering of plane waves of vertical and horizontal polarizations from ensemble of random structures representing the grasslands are solved using the electric field integral equation (EFIE) with the method of moments (MoM). The ensemble average of the fully polarimetric backscattering coefficients is calculated and the corresponding radar vegetation index (RVI) is estimated. It is shown that the ensemble average of the RVI is strongly correlated to the average height of the grass model. It is found that the relation between the grass height and the corresponding RVI can be approximated to either linear or quadratic dependence with 95% confidence level.

ID 31 - The Effect of Source and Drain Pocketing on the Performance of Double-Gate Tunnelling Field-Effect Transistor

Muhammad Elgamal

ABSTRACT

In this paper the digital and analogue performance of double-gate tunnelling FET, DGTFET, is reported, when a pocket of different dielectric is inserted near the source, drain or both. The variation of these pocket lengths and their relative shift to the edge of source or drain region affects device performance. The investigated performance parameters include the ON/OFF ratio, the maximum cut off frequency, fT, the subthreshold swing, SS, and the ambipolar current, Iambi. With the aid of TCAD simulator, the effect of pocket parameter variation is studied. Our study shows that when the main gate dielectric is hafnium dioxide, the source pocket is favored to be of low dielectric constant and high width. However, for the drain case, it is better to have shorter pockets with a low dielectric constant. The investigation shown here proves that pocketing the DGTFET can enhance its whole performance in terms of investigated parameters.

ID 35 - A Cloud-based GIS System for Enterprise Spatial Collaborative Platform

Osama Saber, Salleh Mesbah , and Khalid Eldrandaly

ABSTRACT

Geographic Information Systems (GIS) is a framework for gathering, managing, and analyzing data. It analyzes spatial location and organizes layers of information into visualizations using maps and 3D scenes. Last few years, cloud computing boasts several attractive benefits for businesses and end users. It enables companies to consume various high compute resources dynamically over the Internet rather than having to build locally computing infrastructure. Therefore, cloud-based GIS systems were introduced to provide a dynamic and scalable geographic information technology, spatial data, and spatial applications. In this paper, a cloud-based web GIS services for enterprise spatial collaborative platform is proposed and presented. This research work relied on the network topology of the Arab Academy for Science, Technology and Maritime Transport (AAST-MT) network as a case study to demonstrate the effectiveness of the proposed architecture. The implemented cloud-based GIS infrastructure would help IT administrators to get on-demand and online network insights for deeper visibility and management.

ID 36 - Multi-class Image Classification Using Deep Learning Algorithm

Wael Ahmed Ezat, Mohamed Moawad and Nabil Abdelwahid Ismail

ABSTRACT

Classifying images is a complex problem in the field of computer vision. Classification of images using the Deep learning algorithm is the state-of-the-art in the computer vision researchers. The Deep learning algorithm is a computerized model simulates the human brain functions and operations. Training the deep learning model is a costly process in machine resources and time. Investigate the performance of the deep learning algorithm is mostly needed. The Convolutional neural network (CNN) is most commonly used to build a structure of the Deep learning models. In this paper Convolutional neural network (CNN) model pre-trained on Image-Net is used for classification of images of the PASCAL VOC 2007 data-set. The transfer learning approach is used to improve the performance of the Deep learning CNN model where classification works fairly well with the smallest amount of computation time and fewer machine resources. The behavior of the Deep learning CNN model is studied and the performance has been measured. The obtained results are compared with the obtained test results from the super-vector coding of local image descriptors method, SVM method and Region Ranking SVM method, who tested with the PASCAL VOC 2007 data-set. The final results evaluate the deep learning algorithm as the state-of-the-art method for an image classification task.

ID 38 - Effect of phase noise on two-angle DoA estimation using planar arrays

Asmaa Farahat and Khalid Hussein

ABSTRACT

The effect of phase noise on the accuracy of the two-angle direction of arrival (DoA) is investigated. For this purpose, an efficient technique that depends on the correlation between the signals received by the 2D array and its steering matrix is proposed to estimate the DoA. Also, a new model of the phase noise is proposed to get the consequent phase error in the received signals. The effect of the phase noise power and the array size on the accuracy of the estimated two-angle DoA is investigated. The average error in the estimation of the two-angles DoA is found to increase by increasing the power of the phase noise and by decreasing the array size. The numerical investigations are performed through electromagnetic simulation of a multiple plane waves incident on a 2D planar array of printed patch antennas.

ID 39 - Optimal Distributed Generation Allocation and Sizing Using Genetic and Ant Colony Algorithms

Yousef Y. Zakaria, R. A. Swief, Noha H. El-Amary, Amr M. Ibrahim

ABSTRACT

Distributed generation (DG) can be integrated into distribution systems to meet the increasing load demand. DG can be used to improve power generation systems and enhance distribution system efficiency. However, the installation of DG units at non-appropriate location and sizing can result in negative impacts such as an increasing in power losses and violations of system constraints. Due to the increasing demand in power sector, a number of problems related to transmission line management are quite frequent. The appropriate placement of DG is a reliable solution to many of the distribution system issues such as voltage regulation and power loss reduction. The placement of generating sources into the distribution system can significantly impact the operating state and dynamics of both the transmission and distribution systems. Therefore, a method which can identify an optimum DG location and size is necessary. In this paper, Genetic Algorithm (GA) and Ant colony Algorithm (ACO) optimization techniques are proposed to find optimal sizing and location for distributed generation in electrical networks. The objective function of the work relies upon a linearized model to compute the active power losses as a function of power supplied from the generators. This strategy based on a strong coupling between active power and power flow taking into consideration the voltage angles. With the end goal to exhibit the adequacy of the proposed method, the proposed strategy is applied on IEEE 57-bus standard systems. Different maximum penetration level capacity of DG units and various possible places of DG units among several types of DG (active, reactive or active and reactive power) are considered. Results show that the optimization tools employing GA and ACO are effective in reducing active power losses by finding the optimal placement and sizing of DG units.

ID 40 - Image Segmentation and Verification Based on Machine Learning for Vision Inspection of Chicken Slaughtering

Rubiyah Yusof, Reza Arfa, Muhd Ridzuan Muhd Yunus, Nor Aziah Amirah Nor Muhammad, Nenny Ruthfalydia Rosli and Nordinah Ismail

ABSTRACT

According to the Islamic Law, one of the procedures in halal slaughtering of chicken is the step of severing the trachea, esophagus and both the carotid arteries and jugular veins to accelerate the chicken's bleeding and death. Syariah Compliance Automated Chicken Processing System (SYCUT) uses the Vision Inspection Technology to detect and classify whether a chicken is halal or not. The lack of quality and halal assurance in chicken processing industry made it a need to produce such technology. The system implements image processing techniques and artificial intelligence approach, particularly the Viola and Jones object detection framework for esophagus detection. The results of the experiment from two different sites are 81.8% and 55% respectively. The detection module shows a result of 95.6% and 93.5% also from two different sites which are accuracy as good as human personnel.

ID 41 - A Novel Dual-Band 28/38 GHz AFSL MIMO Antenna for 5G Smartphone Applications

H M Marzouk, M I Ahmed, and A A Shaalan

ABSTRACT

This manuscript introduces the design and analysis of dual-band air-filled-slotted- loop MIMO antenna which operates at 28 and 38 GHz frequencies for coming fifth generation 5G for mobile communications. The antenna designed using low-cost FR-4 substrate material that achieving good performance of means of gain and efficiency. The dual-band operation acquired by presenting an air-filled-slotted loop structure in the radiators. The antenna model contains radiating patch at the upper edge with three AFSLs for 28 GHz and radiating patch at the lower edge with three AFSLs for 38 GHz. The attained results demonstrate that the reflection coefficients for the upper and lower antennas below -10 dB in the frequency bands (27.7 - 28.7) GHz and (37.3 - 38.6) GHz with impedance bandwidths 3.5% for 28 GHz and 7% for 38 GHz which has the quality of covering the 5G band. The introduced antenna is designed and simulated by industry-standard CST 2017 MWS and HFSS programs with substrate size of 55 x 110 mm2 with h = 1.6 mm and εr =4.3.

ID 42 - Power Allocation in 5G mmWave Networks with Massive MIMO and Block Diagonalization

M S Fikry,S Shaaban ,N Esmail and M Abdelkarim

ABSTRACT

In this paper, we consider an energy-efficient downlink power allocation problem of a massive multiple-input multiple –output (MIMO) system in heterogeneous cellular networks. We propose a new technique that uses block diagonalization (BD) precoding with massive MIMO in 5G networks that employs milli-meter wave (mmWave) channel matrix to reduce the level of interference. A power allocation algorithm is then introduced by maximizing the energy efficiency (EE) of the system to obtain optimal downlink power values using sequential quadratic programming (SQP) algorithm. The results reveal that using BD reduces the interference level and hence, increases the energy efficiency.

ID 48 - Performance Assessment for Energy Efficient NOMA over Nakagami Fading Channel

Ahmed Al-Masry, Hesham ElBadawy and Fawzy Ibrahim

ABSTRACT

Nowadays, the Non-orthogonal multiple access (NOMA) has become the most candidate as the multiple access technique for the fifth generation (5G). Although, the massive increase in traffic usage is necessary, but it must not come on the account of energy efficiency (EE). Therefore, Green radio (GR) which one of its main points is energy efficiency (EE) gained a lot of attention in last few years in both academic and industrial fields. In this paper, the Energy-Efficiency in the NOMA downlink system under the effect of the Nakagami-m fading channel is studied. Moreover, the Nakagami-m fading channel can tackle several fading cases according to the parameter m. The system has been solved via an iterative algorithm to investigate the required power level for maximum energy efficiency. Different channel models will be investigated such as: one-sided Gaussian faded channel, Rayleigh faded channel, Raician (Nakagami-n) faded channel, and LOS.

ID 49 - Enhanced Ontology Matching for Big Data Integration

Nesma Mahmoud, and Hatem M. Abdlkader

ABSTRACT

Ontology matching (OM) is a critical process for many disciplines. It aims at identifying the semantic correspondences among different ontologies that are merged for data integration. Unfortunately, OM still faces challenges, especially, in the big data integration (BDI) area. The high degree of semantic heterogeneity problem that prevent the integration of relevant data and increased with large-scale ontologies of BDI. The quality of OM still needs more improvements to cope with BDI applications. So, this paper proposes a semantic OM approach called semantic matcher. It achieves the goals of semantic heterogeneity resolving and quality improvement. It exploits the semantic similarity based on the word embedding model. The word embedding model provides distribution semantic representation of domain words as vectors based on their context. The applicability of the proposed semantic matcher is evaluated through an experiment. The conference and anatomy gold standard datasets and reference alignments are evaluating the experimental results. Accuracy evaluates the quality and measured in terms of precision, recall, and F-measure. Based on the experimental results evaluation, the proposed semantic matcher is promising and efficient in the semantic OM.

ID 51 - A Reliable Gait Analysis Using Fuzzy Logic

Taher Ahmed Abouel Kassem, Mohamed E. Tamazin and Moustafa H. Aly

ABSTRACT

In this paper, an artificial intelligence technique which is fuzzy logic is used as an online prediction of a patient (especially Alzheimer patient) motion status. It depends on the input variables: GPS, GPRS, accelerometer, gyroscope, temperature, heartbeat rate, and the motion status (standing, walking, and running) as an output variable. Fuzzy logic can detect the motion status based on 385 rules for all inputs and output variables. A low-cost smart shoe with embedded positioning tracking is implemented based on sensors and microcontrollers to help Alzheimer patients. The first phase of the experimental work is based on GPS, GPRS, GSM, accelerometer, heartbeat rate sensor, temperature sensor, and a microcontroller, mounted on the shoe side to navigate according to the pedestrian or patient movement. All sensors data are collected by the microcontroller and are transmitted to the GSM receiver in SMS message. The GSM module is connected to the PC via a USB serial port. Transmitting data is periodically sent upon a specific time. The detected data is stored in the database as a function of time. The data includes the position of the patient (latitude and longitude) located on the Google map software, health status (heartbeat rate), gyroscope and accelerometer (x, y, z) of movement as a function of time.

ID 52 - On-Board and Train-to-Wayside Free Space Optical Link: Design and Characterization

Ahmed F. Hussein, Abd El Aziz, Heba A. Fayed and Moustafa H. Aly

ABSTRACT

Nowadays, online connectivity has become an important factor in the current competition between different means of transportation. Being one of the most comfortable and satisfactory means of transportation, a train acts as a mobile office for a wide range of customers. This demands for a high speed connection in order to provide personalized digital services. A reliable and highly secure link is needed for real time information required for signaling, control, safety and security. In this paper a free space optical (FSO) communication link is designed, implemented, and tested at different data rates reaching 5 Mb/s. A small scaled link between train waysides and carriages is implemented in order to set the geometrical boundaries for a practical scaled up link. A 1 m train track is built in laboratory to set the track length and angle of transceiver boundaries for continuous transmission. The received signal voltage is measured and bit error rate (BER) is calculated along the track. The experimental results are compared to the ray trace model simulation results. The experiment is conducted with different field of view (FOV) light emitting diodes (LEDs) in order to check their impact on short and long distance links. Obtained results showed full train track coverage of 90 cm is achieved using the 13°-LED, where the 3°-LED was limited to 85 cm. A modification to the geometrical dimensions is suggested in order to suit the real train track. According to the designed circuits, a bandwidth can reach up to 337 Mb/s. At a speed of 500 kb/s, 9 m of coverage and nearly 38 m are obtained for the 13°-LED and the 3°-LED, respectively. On the other hand, at the maximum bit rate of 337 Mb/s, the coverage is reduced to 1 m and 5 m for the 13° and the 3°- LEDs, respectively

ID 54 - Enhancing the quantum cost of Reed-Muller Based Boolean quantum circuits using genetic algorithms

Mohamed Shaban, Ahmed Younes and Ashraf Elsayed

ABSTRACT

There is a direct equivalence between Boolean functions represented in Reed-Muller logic and Boolean Quantum Circuits. Different polarity Reed-Muller expansions will give different Boolean quantum circuits with different cost for the same Boolean function. For a given Boolean function with n variables, there are 2^n possible expansions. Searching for the expansion that gives a Boolean quantum circuit with minimal quantum cost within the search space is a hard problem for large n. This paper will use genetic algorithms to find the fixed/mixed polarity Reed-Muller expansion that gives a Boolean quantum circuit with minimum quantum cost to optimize the circuit realization of a given Boolean function.

ID 55 - Sparse Indexed OFDM Modulation Technique For Visible Light Communication (VLC) With Reduced Peak-to-Average Power Ratio (PAPR)

Amgad F. Aziz, Omar A. M. Aly and Usama S. Mohammed

ABSTRACT

In this paper, diversity sparse activated subcarriers OFDM index modulation (DSAS-OFDM-IM) is proposed to improve the power efficiency (PE) of interpolated sparse activated subcarriers OFDM index modulation (ISAS-OFDM-IM), which was proposed to improve spectrum efficiency (SE) and bite error rate (BER) of the OFDM modulation technique in visible light communication (VLC) systems. The PE improvement using DSAS-OFDM-IM resulted from the improvement of the peak to average power ratio (PAPR) for the transmitted signal. DSAS-OFDM-IM and ISAS-OFDM-IM are considered as time domain interpolated version of the sparse activated subcarriers OFDM index modulation SAS-OFDM-IM. Sparse activated subcarriers OFDM index modulation SAS-OFDM-IM, improves the SE of the classical OFDM index modulation. Unfortunately this is done on the cost of degrading the BER due to burst errors. ISAS-OFDM-IM solves for the problem of burst errors by introducing zeros between samples in the time domain signal, which leads to a good improvements in BER [1]. ISAS-OFDM-IM solves for the problem of the burst errors but degrading the PAPR due to the reduction in the average power. The proposed DSAS-OFDM-IM solves for the problem of burst errors and reducing the BER without affecting the PAPR of the SAS-OFDM-IM as was occurred by ISAS-OFDM-IM. Results indicate good improvements in both SE and PE of OFDM, which is considered as important requirements for visible light communication (VLC) as a new trend in optical wireless communication.

ID 57 - Millimetre four-element microstrip aperture-coupled array for 5G wireless communication systems

F. Sheeren, J. Osama, M. Ihab1, M. Tharwat, L. Adel, L. Khashan

ABSTRACT

As the demand for newer technologies to deliver higher data rates is increasingly on the rise, millimetre (mm) wave technology is considered to be the ultimate solution to meet such demand. Due to these demands the cellular communications is expected to move to the mm-wave Ka-band ranging between 26.5GHz to 40GHz. However, the mm-band is not totally immune to constraints such as high atmospheric attenuation. This can be overcame by designing high gain antennas. Moreover, planar antenna structures are considered the more appropriate designs, as they meet the requirements for user friendly compact handheld devices. Four element patch antenna is introduced for providing high gain in the broadside direction. Aperture coupling is used to excite the patch elements, and an air gap cavity is investigated to improve the impedance bandwidth. Air gap is replaced by different materials to assess the impact on gain and bandwidth. This work is a part of undergraduate graduation project.

ID 58 - FWM Mitigation in DWDM Optical Networks

Habib Ullah Manzoor, Tareq Manzoor, Ashiq Hussain, Moustafa H. Aly

ABSTRACT

In this paper, three optical communication systems have been proposed to mitigate Four Wave Mixing (FWM). Three techniques are used, namely; low input power with high gain amplifier, a combined Optical Time Division Multiplexing (OTDM) and Wavelength Division Multiplexing (WDM) system, and the use of alternative circular polarization. The first technique involves reduction in input power to -20 dBm and then amplifying it 20 dB before demultiplexing. The second technique divides the input signal into four time slots and then combine them with a power combiner. In the third technique, the polarization of input pulses is changed before multiplexing into right and left handed circular polarization.Exhaustive set of simulations is carried out using Optisys. The performance analysis includes Q-factor, Optical Signal to Noise Ratio (OSNR), received power, Bit Error Rate (BER) and eye diagram.

ID 61 - A Study on Biological Sample Preparation for High Resolution Imaging of Scanning Electron Microscope

Siti Rahmah Aid, Nik Nur Anis Awadah Nik Zain, Nur Nadhirah Mohd Rashid, Hirofumi Hara, Kamyar Shameli, and Iwamoto Koji

ABSTRACT

Green chemistry has drawn attention for synthesizing nanoparticles as it utilizes an eco-friendly nontoxic chemical in the synthesis protocol. In addition, researchers start looking into the potential of organism such as bacteria, fungi and plants for synthesizing nanoparticles. Synthesis of nanoparticle requires details on structural analysis before/after synthesis in order to evaluate and control the quality of nanoparticles. Scanning electron microscope (SEM) has been widely used as an imaging instrument to structurally characterize nanoparticles before/after synthesis process. Maintaining the vacuum level in SEM system and controlling contamination originated from sample are crucially important to enable high resolution imaging. In addition, sample surface need to be conductive to prevent image distortion due to the electron charging effect. Hence, raise the importance to study the method in preparing biological sample for SEM imaging. This work focuses on the three approaches of drying process for plant, bacteria and algae samples. Proper selection of preparation method on each samples involving air-drying using HMDS, CPD and FD methods have been done in order to prevent the surface tension effect during drying process, which will result in the modification of the original structure. The comparison was made to get insight on the suitable sample preparation method for the specific biological sample. It is found that air-drying or CPD methods are suitable for the liquid-rich biological sample, while FD method can be a preference for biological sample that contains less liquid.

ID 63 - High gain steerable antenna with different substrate materials for satellite applications

Mohamed Wady, Wael Swelam and Mohamed Abdel Azeem

ABSTRACT

In our analysis in this paper we have improved the design of microstrip antenna array to be used in the non-geostationary satellite systems with electronically steerable beam which can trace the desired earth station on Earth without any need to change the angle of the cube satellite in space so we can save the batteries on the satellite board with low cost, easy to fabricate antenna , The array antenna consists of multiple patches and multi feeders with different phases to control the steerable beam electronically, The antenna array operates in Ka frequency bandwidth and consists of 6*6 elements with gain reaches 18.8dBi, each element in the array has the dimensions of (4.6mm * 2.6mm) with rounded edges and the total size of the antenna array is (5.43 cm * 3.33 cm), there are narrow strip fences applied between elements to reduce the effect of mutual coupling and in accordance reduce the sidelobe level of the antenna array.

ID 64 - Design of X-Band Low Noise Amplifier For Radar Applications

Mohammed Abdelhakeem, Saleh Eisa, Khaled Shehata and Hani Fekry

ABSTRACT

This paper presents an analysis for a single stage Low Noise Amplifier (LNA) for X-band radar application. The LNA is designed using commercially Pseudomorphic High Electron Mobility Transistor (P-HEMT). The LNA is designed to achieve low noise figure, high gain and a better matching to 50 Ω at both input and output terminals. Cascaded and cascoded circuit topologies were implied to achieve the targeted requirements. In addition, negative feedback technique is utilized to increase the operating bandwidth. The circuit is designed and simulated using Advanced Design System (ADS) tools. The design showed good dynamic range with moderate gain. The cascode LNA resulted in better noise figure (NF).

ID 65 - Efficient Linearized Model of Pressurizer System in Pressurized Water Reactors for Control Purposes

Amal A. Sheta, Elsayed H. Ali, Refaat M. Fikry, Tarek A. Mahmoud, Sayed M. El-Araby and Mohammed I. Mahmoud

ABSTRACT

The pressurizer has an important role to ensure the protected operation of pressurized water reactor (PWR) by preserving the reactor coolant system pressure among allowed tolerances. In this paper, a non-equilibrium two-region nonlinear pressurizer (PZR) model was linearized using Taylor technique to introduce the linear models of pressurizer transients for the controller design purposes. Taylor series expansion of functions around an equilibrium point was calculated. Several assumptions are considered during linearization process such as the mechanical work effect is neglected, the two regions share the same pressure that belongs to the saturated state of the steam and the pressure dependence of the thermo-dynamical variable (enthalpy, density) is neglected. The linearized model consists of five states; rate of changes for: mass of steam &water in the PZR, mass of water in the PZR, mass of water in the PC, steam temperature in PZR, and water temperature in PZR. The nonlinear and linear PZR models was implemented in MATLAB/Simulink. The closed-loop of the linearized model of PZR pressure and water level is implemented and investigated using Standard proportion-integration-differentiation (PID) controllers. Simulation results and the evaluation performance indicate that the proposed linear model of PZR is efficient, and it can used for control purposes.

ID 66 - Self-Cleaning and Hydrophobic Pineapple Peel Fibre based Biocomposite

Roshafima Rasit Ali, Solehah Mohd Raffae, Jesbains Kaur, Norazana Ibrahim, Rafiziana Md Kasmani, Hasrinah Hasbullah and Nurfatehah Wahyuny Che Jusoh

ABSTRACT

Biocomposite has been widely used as plastics replacement for its biodegradability. However, the water absorptivity defeats its purpose as food packaging. The water absorption analysis for pineapple peel fiber (PAPF) was done according to ASTM D570-98 and it has been proven that the water content increases to 7.2% with the 50% content of PAPF in the bio-composite (50% PAPF). For that matter, hydrophobic coating was synthesized and applied on PAPF based bio-composite. The bio-composite was produced using Low Density Polyethylene (LDPE), pineapple peel fibre (PAPF), Linear LDPE grafted maleic anhydride (LLDPE-g-MA) as compatibilizer and Refined, Bleached Deodorized Olein (RBDOL) as plasticizer. The coating was synthesized by using polydimethylsiloxane (PDMS) and decamethylcyclopentasiloxane as hydrophobic component, silica nano-particles as nanostructured particles and non-organic solvent and non-ionic surfactant p-octyl polyethylene glycol phenyl ether as surfactant. The emulsion was homogenized and after that sprayed onto the surface of PAPF bio-composite and dried in the oven at 50-60˚C for 24 hours. Through the 100µm magnification using field emission scanning electron microscope (FESEM), the hydrophobic coating was proven to conform the Cassie-Baxter hydrophobic property. C-O bond from the PAPF disintegrates after the production of bio-composite from the Attenuated Total Reflectance Fourier Transform Infrared (ATR FTIR) spectrometry transmittance. The application of the coating onto the surface of PAPF bio-composite gave the surface hydrophobic property where the contact angle changes from 82.27±2.66˚ which is hydrophilic to 122.63±2.17˚ which is hydrophobic. The bio-composite with the highest PAPF content will also exhibit self-cleaning ability which makes it suitable for the usage of hydrophobic food packaging material.

ID 67 - Dynamic modelling and simulation of clean coal power generation

Norhuda Abdul Manaf and Ali Abbas

ABSTRACT

Retrofitting coal-fired power plant (PP) with carbon capture technology can be used as an effective transition solution towards clean coal-based energy production. Thus, this study analyses the operational/behavioural performance of retrofitting carbon capture to a coal-fired power plant (PP-PCC plant). A real-time data-driven model representing PP-PCC plant is developed in Matlab/Simulink software facility. The model simulates the dynamic response of integrated plant subjected to operational uncertainty and unprecedented perturbation. A positive variation (increment of flowrate) of air, coal and lean solvent flowrates exhibit significant dynamic responses toward the power plant load, carbon capture efficiency (CC) and energy performance (EP). Where, variation of these variables contribute to the elevation of capture percentage and improvement of energy performance. This study is beneficial for preliminary understanding of the transient variable behaviours of clean coal power generation as one of the mitigation measure to ensure proposed integration is feasible in term of environmental and economic performances.

ID 68 - Low Complexity Viterbi Decoder for RSCC Concatenated Codes

Ramy Samy and Ashraf Mahran

ABSTRACT

One of the primary obstacles to achieving reliable communication transmission for aerospace applications is the power constraints. Therefore, it is appealing to use powerful channel coding techniques with small complexity of decoding. The robust forward error correction scheme using Reed-Solomon as outer code concatenated with convolutional as inner code is an appealing scheme whose apps are commonly used in wireless and space transmissions. In this work we aim to reduce the complexity of the convolutional code decoding process as the number of computations and memory need increases exponentially with the code's constraint length. We use the Adaptive Viterbi Algorithm to bring Viterbi decoder with small complexity. The proposed work yields approximately the same error performance as the conventional concatenated Reed-Solomon convolutional, while requiring a substantially smaller average number of computations for the convolutional code decoding process.

ID 70 - Smart Packing Simulator for 3D Packing Problem Using Genetic Algorithm

Uswah Khairuddin, Nur Amalin Zahra Mohd Razi, Mohd Shahril Zainol Abidin and Rubiyah Yusof

ABSTRACT

Every year, at least 100 million tons of solid waste globally comes from packaging waste, in which partly created by inefficient packaging. Multiple box arrangement or bin packing solution directly addresses this problem which also affects storing space in production, manufacturing and logistics sector. Smart packing algorithm is designed for solving three-dimensional bin/container packing problem (3DBPP) which has numerous practical applications in various fields including container ship loading, pallet loading, plane cargo, warehouse management and parcel packing. This project investigates the implementation of genetic algorithm (GA) for a smart packing simulator in solving the 3DBPP applications. The smart packing system has an adaptable chromosome length GA for more robust implementation, where chromosome length will be changing with number of boxes. It can optimize multiple box arrangements and the boxes movements and positions are simulated through each GA generations, for realistic adaptation. The system is able to make optimum arrangement for the boxes so they can fit into a smallest container possible. The time taken for GA to converge is dependent on the number of boxes.

ID 71 - Characteristics of Electromagnetic Scattering from Vegetation Models using Random Wire Structures with Applications to Land Imaging SAR Systems

Shimaa Soliman, Khalid Fawzy and Abd-El-Hadi Ammar

ABSTRACT

Clouds of both random curly wires and randomly-oriented straight wires with good conductivity are used to construct random volume models to simulate structures found in vegetation areas on the ground surface like naturally cultivated plants involving grass, trees, primary crops and chaff clouds. A variety of such random volumes are then subjected to incident electromagnetic plane wave of specific polarization to study the properties of electromagnetic scattering from such natural objects existing on the earth surface. It is shown that the frequency dependence of the RCS of such random structures has maxima around the frequencies corresponding to the natural modes of the wire structures constituting the volumetric model. On the other hand, the frequency behaviour of the RCS of these random clouds exhibits sharp peaks or anti-peaks over very narrow intervals of the frequency due to the generation internal resonant modes between the finite-length pairs of wires constituting the random clouds. It is shown that such maxima, sharp peaks and anti-peaks of frequency behaviour of the backscattered field are very important to extract useful information for construction of microwave images and, also, for the classification of the vegetation areas that appear in earth remote sensing Synthetic Aperture Radar (SAR) images taken for the ground surface. The polarization properties of the fully polarimetric backscattering coefficients collected by a land imaging SAR system are studied through electromagnetic simulation.

ID 73 - Energy Efficiency Improvement in Mobile Communication System by Reducing the PAPR

Sara Mahmoud Farid Ahmed, Khaled Shehata and Hesham Elbadawy

ABSTRACT

Peak to average power ratio (PAPR) is a great issue in multicarrier systems especially in the LTE/LTEA communication system, so there is still a wide range that handles the PAPR problem. Orthogonal frequency division multiple access (OFDMA) technique is used in the downlink LTE system as it has many advantages over multipath propagation system. On the other side it suffers from a high PAPR that will affect the energy efficiency. In this paper, a new hybrid scheme is proposed in the downlink mobile communication system to overcome this issue. Besides reducing the PAPR, the proposed scheme did not have a significant increase in the system complexity but also it had nearly the same bit error rate (BER) system performance as OFDM system. Also we introduce a combination of different pre-coding techniques in OFDM system that improve the BER such as (Discrete Hartley Transform, Discrete Cosine Transform and Discrete Sine Transform) with the companding techniques that have a good ability in reducing the PAPR with a little increase in system complexity such as (Absolute exponential, Tangent rooting and Logarithmic) companding techniques. We tested the system performance for different techniques combination, and according to the analysis and the simulations done, it was found that the hybrid technique that is composed from the Discrete Hartley transform pre-coding technique and the Logarithmic companding technique in the downlink system outperforms all other hybrid techniques combinations.

ID 74 - Detecting spam campaign in twitter with semantic similarity

Mohamed Mostafa Elsaied, Amira Abdelwahab and Hatem Mohammed Sayed

ABSTRACT

Twitter is a widespread supply for real-time news distribution between individuals. Furthermore, spammers could post any kinds of spam content to users, and a variant of incidents are committed on Twitter against users. These threats aren't restricted to the social media platforms however they threaten the safety of Twitter users. Most of the researches use deep learning techniques to detect Twitter spammer activities. The traditional solutions check the behavior of each account or campaign of similar purpose accounts. The number of solutions concentrates on detecting spam campaign based on URL only and ignoring text in a tweet. In this paper, the lightweight framework is proposed to take tweet text into consideration for optimizing spam campaign detection methods based on deep learning techniques. The main contribution of this work summarized in two key points. First one is to summarize the text of the tweets to cluster them. The second one is to find similar tweets based on Siamese Recurrent Network. Experimental results show the ability of the proposed technique to extract the right candidate campaign and classify them as spam or not with high recall and precision.

ID 76 - Towards Multi Robot Task Allocation and Navigation using Deep Reinforcement Learning

Ahmed Elfakharany, Rubiyah Yusof and Zool Ismail

ABSTRACT

Developing algorithms for multi robot systems to reach target positions and navigate safely in the environment is an open field of research. Most systems treat Multi Robot Task Allocation (MRTA) and Multi Robot Path Planning (MRPP) as two separate steps each with its own set of algorithms in which the MRTA algorithm assigns each robot to a task and the MRPP algorithm guides each robot through the environment towards the assigned goal position while avoiding both static and dynamic obstacles. In this paper, we present a method that combines both steps by using a deep reinforcement learning model. The model consists of a decentralized sensor level policy which outputs the robot's velocity to guide it through the environment towards the selected goal position and avoiding collisions. The model was trained in a simulation environment and all the robots are homogeneous differential drive robots. The objective is to ensure that each robot reaches a unique goal position with the number of goal positions is equal to the number of robots. The results of training the policy in an environment is presented with both static and dynamic obstacles with four robots and four goal positions

ID 77 - Parallel implementation for ECCP based on Montgomery ladder algorithm

Shaimaa Abu Khadra, Salah Eldin Abdulrahman and Nabil A. Ismail

ABSTRACT

An Elliptic Curve Crypto-Processor (ECCP) is a favourite public-key cryptosystem. It is used for embedded systems due to its small key size and its high security arithmetic unit. It is applied in constrained devices which often run on batteries and have limited processing, storage capabilities and low power. A finite field polynomial multiplier takes the most implementation effort of an ECCP because it is the most consuming operation for time and area. So, it is preferable to optimize this operation especially for light devices where the small area is needed. This research introduces a hardware design for parallel ECCP binaryimplementation that is based on Montgomery ladder algorithm. This implementation is targeted for GF(2163) and GF(2409) where the executed time are 2.9 □s and 29 □s respectively. The implementation is performed on Xilinx ISE Virtex6.

ID 79 - Enhanced Parallel Outlier Detection Technique for Time Series Data

Ahmed Farag, Rashed Salem and Hatem Abdelkader

ABSTRACT

In data mining, outlier detection is applied in different domains. It has a very large application such as energy consumption analysis, forecasting hurricanes in meteorological data, fraud and intrusion detection, event detection and system monitoring in sensor networks, etc. Most of existing outlier detection techniques depend on the properties of a particular type of data and cannot deal with a large volume of data well, which mean that there is a necessity for improved methodologies and techniques to be applied to a large amount of data with different types in other application areas. In this paper, a parallel outlier detection technique is developed to detect the outliers in the Time-series data. Although there are many types of outliers, this paper concentrates on the contextual anomalies. The proposed technique uses a graph approach to detect the outliers. The proposed technique is very flexible, fast, and no labeled data is needed comparing to many previous approaches. The experimental results show the detected contextual outliers in the Time-series data, as well as the efficient scaling up to handle the massive data by increasing the number of processors. The results prove that the parallelism of the proposed technique is very valuable.

ID 80 - MANET's Energy Consumption using modified Integer Linear Programming and modified Ant-Colony Optimization Algorithms

Mohamed Ashraf, Ben Bella Tawfik, Sherif El-Diasty and Mohamed Hassan

ABSTRACT

Mobile Ad-hoc Network (MANET) is a self-organizing wireless network that communicates without infrastructure and suffering from low power-battery. The challenges of under-optimization have received a great amount of attention from researchers, and Energy Consumption (EC) is the most important of those challenges for them in this field. Therefore, the main objective in finding a route from source to destination is to minimize the node energy consumption. Integer Linear Programming (ILP) and Ant Colony Optimization (ACO) are two algorithms that enhance energy consumption and processing time, which are Quality of Service (QoS) requirements. In our paper, we proposed a modified version for two algorithms, which are evaluated regarding two criteria: energy consumption and processing time using an experimental study. In the modified ILP, the shortest route is selected from all possible routes using the minimum EC as an objective function and a group of constraints. The second algorithm is a modified version of ACO, based on ants ' behaviour seeking a route between their colony and food source. The two algorithms are compared using three different criteria (route selection, EC and processing time). The proposed algorithms have been implemented.

ID 81 - Design and Implementation of 32 element Microstrip Array Antenna for Ku–Band Satellite application

Mohamed Hassouna, Wael Swelam and Mohamed Abdel Azeem

ABSTRACT

This paper present 32 Element microstrip rectangular patch array antenna for KU- Band. The aim of the design is to achieve low cost, low weight and high gain antenna for the transmissions frequency range of KU – Band satellite system. The paper also presents 5 designs for array antenna 2, 4,8,16 and 32 elements and the results comparison between them. The substrate material is FR-4 with 1.58 mm thickens. The simulation made by CST Microwave studio 2017. The size of final design is 85×98.81 mm and the bandwidth is 1.489 GHz. The frequency range of design starting from 13.318 GHz to 14.842 GHz with maximum Gain 13.7 dB. The final design of 32 elements array antenna has been fabricated and compared with the simulation results, a good agreement were obtained and the difference between fabrication and measurements results was due to fabrication and measurements tools tolerance. The fabricated design has been measured using Vector network analyzer ROHDE & SCHWARZ ZVB20.

ID 84 - LNA Design Optimization Using DNA Computing

Roshdy Abdelrassoul, Abd El-Menem Abd El-Bary and Aya El-Ebshihy

ABSTRACT

A noise model for heterojunction transistors using a new technique for prediction was introduced using a neural network model, and was applied to get higher accuracy for transistor noise parameters. The new model is employed in designing of a wideband Low-Noise Amplifier (LNA), which resulted higher accuracy for the four noise parameters required, using only one neural network for simulation of noise figure parameters. The accuracy of this model has been demonstrated by coordinating anticipated and estimated values of heterojunction transistors for a specific data set of noise parameters at various frequencies, temperatures and bias points. DNA computing was used to design a Low-Noise Amplifier (LNA). The DNA computing method demonstrates good and very accurate results and also shows a very high accurate results in prediction of the noise parameters by using it as FFNN to determine a threshold level value, which consequently increased the gain leading to higher bandwidth. Comparison of the new method (DNANN) to other classical optimization techniques shows that the DNA computing method results in optimized noise parameters, which consequently leads to higher LNA gain which consequently leads to improved bandwidth.

ID 85 - Broadband Printed-Dipole Antenna for 4G/5G Smartphones

Manar Khalifa, Lamia Khashan, Hesham Elbadawy and Fawzy Ibrahim

ABSTRACT

Nowadays, mobile communication systems are required to provide larger bandwidth and higher data rates to accommodate the increasing number of subscribers, and the vast amount of data handling. The fifth generation (5G) requires higher frequency bands as the sub-six and the millimeter bands. New designs for antennas are expected to fulfil these requirements in addition to covering the current mobile systems. Thus, there is an increasing demand to design antennas that cover both 4G and 5G mobile communication systems. In this paper, a novel design based on monopole antenna of various shapes and dimensions is introduced. The single-element antenna yields an |S11| <−6-dB, frequency bands (from 1.4 to 2.64 GHz) and (from 3.32 to 4.64 GHz) with gain of 5 dBi and efficiency of 80%. So, this antenna covers 23 bands of the total (32) 5G NR bands in addition to 30 bands of the total (76) LTE bands.

ID 86 - Waste Tire Carbon Adsorbent for Active Removal of Paracetamol in Aqueous Solution

Nurfatehah Wahyuny Che Jusoh, Choo Tzy Yeng, Ahmad Masudi and Roshafima Rasit Ali

ABSTRACT

Waste tyre carbon adsorbent was prepared via three different calcination temperatures (500ºC, 700ºC and 900ºC) and activated by sodium hydroxide solution. The phase and crystallinity analysis of each adsorbent is determined using X-ray diffraction analysis. The study revealed that different crystallinity of prepared adsorbent were obtained when calcination temperature is varied. Next, the effect of calcination temperature was investigated on the removal of paracetamol in aqueous solution. The highest percentage removal (99.37%) was obtained when the waste tire carbon adsorbent is calcined at 900ºC for paracetamol initial concentration of 10 mg/L at pH 3. In this case, the result obtained can be contributed to the production of adsorbent using waste tire with suitable calcination temperature for the paracetamol removal in aqueous solution.

ID 87 - Feedback Recommendation System Based on Structured Feedback Acquisition

Ehsan Hassan, Nada Sherief, Walid Abdelmoez and Amani Saad

ABSTRACT

Users' feedback are increasingly becoming a vital factor during the software evolution process. Users' feedback are widely considered to be an indication of how satisfied are the system's users. It was found that large percentage of feedback represents problems reported by users who face problems in using the system. It usually happens that similar problems are reported by different users. Users' feedback are usually communicated in an ad-hoc manner with no defined structure. The ad-hoc nature of the feedback makes it difficult to study and analyse feedback. We based our work on a structured feedback system to ensure we get better results. In this paper we propose a recommendation system which recommends to the user reported problems that are similar to his. Initial evaluation was conducted and the results are promising.

ID 88 - An efficient hybrid visible light communication/radio frequency system for vehicular applications

Marwa M. Abdel Momen, Heba A. Fayed, Moustafa H. Aly, Nour Eldin H. Ismail and M.A. Mokhtar

ABSTRACT

This paper focuses on improving the traffic system for Intelligent Transportation System (ITS) by using an imaging receiver instead of photodiode as a single receiver. Here, two simple traffic models have been proposed and analyzed in order to optimize various important design characteristics such as signal to noise ratio (SNR), required power, received information, bit error rate (BER), and modulation technique. First, a standalone visible light communication (VLC) with different modulation techniques is considered. The On-OFF Keying (OOK), L-Pulse Position Modulation (L-PPM), and Inverse L-Pulse Position Modulation (I-L-PPM) are investigated. Then, a hybrid communication system utilizing VLC and radio frequency (RF) is proposed for position-based services. The VLC/RF system takes the benefits of both systems and offers transmission for long distances which is a significant concern in ITS and to improve the link reliability in infrastructure to vehicle communications. This means that the probability of having a communication link between the transmitter and receiver is maintained without interruption. The performance is evaluated. The simulation results show a considerable increase of the received information using the proposed hybrid VLC/RF system compared with a standalone VLC system.

ID 94 - Simplified Hybrid Secure Algorithm for Mobile Banking Application

Roayat Ismail Abdelfattah, Sherif Awad and Mohamed Nasr

ABSTRACT

M-banking is one of the main divisions of m-commerce. It provides daily banking operations to the customer using his mobile with the supported application. But the current applications are facing security challenges due to the limitations of mobile resources. There are two major schemes. First, the public key infrastructure (PKI) but, suffers the scalability and certificate management problems. Second, the identity-based public key cryptography (IB-PKC) but has key escrow problem. In this paper a modified algorithm to solve these problems by combining elliptic curve Signcryption with certificate less cryptography and enhance the security with lower computational time. From the results, the proposed algorithm has superior performance compared with earlier schemes. Also, it supports multiple types of messages (such as document and multimedia).

ID 97 - Secure Image Encryption Scheme Based on DNA and New Multi Chaotic Map

Roayat Ismail Abdelfattah, Hager Mohamed and Mohamed E Nasr

ABSTRACT

Encryption of medical image is very important subject especially in wireless body area networks (WBAN) applications where the devices have many limitations in memory size, energy and computation capabilities. In this paper an image encryption scheme which has simple computation, small memory size and more secure performance is introduced. So, it is suitable for WBAN devices limitations. The scheme consists of two phases. In the first phase, the patient information (such as name, age, state, ... etc) is hidden in the patient medical image (such as x-ray, MRI, …. etc) using Least Signification Bit (LSB) technique to reduce the capacity of data encrypted and patient information will not be visually available to unauthorized personnel. further, the medical image is encrypted using DNA coding rules and a new multi chaotic map system. DNA coding improves computational speed and provides Large capacity for data transmission while the multi chaotic map consists by merging Henon, Sin and Ten map (HST) and produces pseudo random sequences with more chaotic characteristics (more random behavior) and different from the sequence produced in single henon, ten and sin map. Results show that this scheme has a good peak signal to noise ratio (PSNR), low correlation, huge key space, key-dependent pixel value replacement and can resist statistical and differential attacks.

ID 98 - Open Challenges in Internet of Things Security

Ali Selamat and Zeinab Iqal

ABSTRACT

The uses of internet of things (IoT) is increasing exponentially, number of connected devices became (according to reports) larger than human population, the uses of IoT applications involved of all aspects of our lives, and the data itself that is collected and transmitted by IoT devices and networks is very sensitive and need to be secured. All those reasons create and increase the need for improving IoT security solutions. In this paper, IoT security challenges was explored collected and categorized, for the purpose of having big picture for the situation. Number of researches during the last three years were studied to find out the still open challenges in IoT security, we also determined the different types of challenges categorization that was used by the researchers, and finally, we select a bigger sample of researches to discover the trend in IoT security challenges, and the changes happened during the last five years. The result of the analysis gives a clear idea about the importance of IoT security, it provides us of motivation for more researches in this area.

ID 99 - Transmission of 128 Gb/s Optical QPSK Signal over FSO Channel under Different Weather Conditions and Pointing Errors

Mai Adel, Hussein Seleem, Mohamed Nasr and Heba Khotby

ABSTRACT

Free space optics (FSO) is a promising technology for high data rate transmission in which optical data is transmitted wirelessly from one place to another. It has a variety of applications nowadays including indoor, outdoor, underwater, and deep space communications. However, the availability of link under various atmospheric conditions is a major concern. In this study, we evaluate the transmission of 128 Gb/s optical Quadrature phase shift keying (QPSK) signal under different weather conditions and pointing error. Simulation parameters such as FSO link range, atmospheric attenuation, pointing loss, and wavelength are taken into consideration. The system performance in terms of eye diagram, constellation, and received signal to noise ratio (SNR) are compared to find the best performance under different weather conditions.

ID 100 - Discovering Hate Sentiment within Twitter Data through Aspect-Based Sentiment Analysis

Nurulhuda Zainuddin, Ali Selamat and Roliana Ibrahim

ABSTRACT

Aspect-based sentiment analysis is a vital issue in fine-grained sentiment evaluation, which intends to provide an automatic prediction of the sentiment polarity, given a particular aspect in its context. This paper presents an aspect-based sentiment analysis to find hate sentiment inside twitter data. Word embeddings have had prevalent utilisation in Natural Language Processing (NLP) applications because their vector representations have the ability to capture useful linguistic relationships and semantic properties between words with the help of deep neural networks. Word embeddings have often been used in machine learning models as feature input, which allows for the contextualisation of raw text data in machine learning techniques. The model has the ability to represent the relationship between the word embedding features and the aspects as feature representation within the suggested model. To assess the efficacy of the proposed method, extensive experiments were performed on the dataset of the researcher, as well as on widely utilised datasets. It was demonstrated by the experimental results that the proposed method was able to obtain impressive results among the three datasets.

ID 103 - Solar cell performance enhancement with optimized CIGS absorber bandgap and buffer layer

Yasmina Osman, Mostafa Fedawy, Mohamed Abaza and Moustafa H. Aly

ABSTRACT

In the past years, copper-indium-gallium-diselenide (CIGS) based solar cells have improved the efficiency records reaching to 22.6%. This result shows that CIGS absorbent is idealistic for thin-film solar cells. The most attractive feature in CIGS is the tunable bandgap of the absorber layer that varies from 1.06 eV to 1.7 eV according to the gallium fraction in the absorber layer. As a result of this feature, the solar spectrum can be best matched. In the presented work, the influence of the bandgap of the absorber is investigated using solar cell capacitance simulator (SCAPS). An optimum bandgap of 1.39 eV results in a maximum efficiency of 24.288%. In order to get a Cd-free CIGS thin film solar cell, In2S3 has been used as a buffer layer instead of CdS. The results show that In2S3 is a proper alternative that does not degrade the cell performance.

ID 107 - Enhancing the Design of Arthroscopic Shaver to Reduce Stresses Experienced

Nader Hafez, Mi El-Anwar and Mostafa R. A. Atia

ABSTRACT

In light of the scarcity of design data for arthroscopic surgery equipment due to manufacturers' non-disclosure of research and patents, the aim of the presented work is to study the mechanical stresses experienced by the arthroscopic shaver during soft tissue resection, thus reaching a new design that enhances performance and tool life. The finite element analysis method was used to determine the effect of changing either the tooth angle or rotational speed on stresses experienced by the shaver by creating a model on ANSYS Explicit Dynamics Module. Results were analysed to find that a tooth angle in the range of 55° to 62° would achieve less stresses on the blades, as well as verifying that cutting at 1500 rpm is the most suitable speed for a longer tool life. This research is a part of a project implemented by the NRC and is planned to be verified by experimental work.