

2018 21st Saudi Computer Society National Computer Conference (NCC 2018)

**Riyadh, Saudi Arabia
25-26 April 2018**



**IEEE Catalog Number: CFP18NCG-POD
ISBN: 978-1-5386-4111-8**

**Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18NCG-POD
ISBN (Print-On-Demand):	978-1-5386-4111-8
ISBN (Online):	978-1-5386-4110-1

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

NOVEL TECHNIQUE OF CONTRAST ENHANCEMENT FOR UNCOOLED INFRARED SYSTEMS WITH DUAL FIELDS OF VIEW OPTICS.....	1
<i>Abdulaziz Mohammed Algandi ; Ahmad Abbas Ahmad Adas</i>	
ADVANCED APPROACH ON XSSDS TECHNIQUE.....	7
<i>Sara Tuza ; Shatha Alarabi ; Sara Al-Amri ; Nisreen Innab</i>	
AFFECT DETECTION FOR HUMAN-HORSE INTERACTION	12
<i>Turke Althobaiti ; Stamos Katsigianis ; Daune West ; Malcolm Bronte-Stewart ; Naeem Ramzan</i>	
ACTIVE DIRECTORY AND RELATED ASPECTS OF SECURITY	18
<i>Afnan Binduf ; Hanan Othman Alamoudi ; Hanan Balahmar ; Shatha Alshamrani ; Haifa Al-Omar ; Naya Nagy</i>	
IS THE AGILE DEVELOPMENT METHOD THE WAY TO GO FOR SMALL TO MEDIUM ENTERPRISES (SMES) IN SAUDI ARABIA?.....	26
<i>Reem Bin-Hezam ; Amal Bin-Essa ; Nirase Fathima Abubacker</i>	
WAKEUP: DESIGNING MULTIMODAL ALERTS FOR DROWSY DRIVERS WITH SMARTPHONES	32
<i>Ahad Shabib Alotaibi ; Amna Asif</i>	
STEGANALYSIS SYSTEM FOR COLOUR IMAGES BASED ON MERGING THE COLOUR GRADIENT COOCURRENCE MATRIX AND HISTOGRAM OF DIFFERENCE IMAGE.....	39
<i>Ahd Aljarf ; Saad Amin</i>	
THE INFLUENCE OF TECHNOLOGICAL FACTORS ON STUDENTS' ACADEMIC PERFORMANCE.....	46
<i>Ahmed Omer Ahmed Ismail ; Ahmad Kamil Mahmood</i>	
DEVELOPMENT OF SCALES TO MEASURE THE LEVEL OF AGGRESSION IN SAUDI CYBER SPHERE	52
<i>Ali A. Albar</i>	
CHALLENGES OF IOT BASED SMART-GOVERNMENT DEVELOPMENT	60
<i>Ali Alenezi ; Zainab Almeraj ; Paul Manuel</i>	
THE CURRENT SITUATION OF INSIDER THREATS DETECTION: AN INVESTIGATIVE REVIEW	66
<i>Gaseb Alofti ; Nathan Clarke ; Fudong Li ; Steven Furnell</i>	
A HOLISTIC FRAMEWORK FOR ENHANCING PRIVACY AWARENESS	73
<i>A. Alshehri ; N.L. Clarke ; F. Li</i>	
ADAPTIVE MODEL OVER A MULTI-LABEL STREAMING DATA.....	79
<i>Amani M. Alattas</i>	
A REVIEW ON RECOMMENDING SOLUTIONS FOR BUGS USING CROWDSOURCING.....	84
<i>Amany Al-Batlaa ; M. Abdullah-Al-Wadud ; M. Anwar Hossain</i>	
IMPORTANCE OF MOBILE LEARNING IN IMPROVING THE QUALITY OF EDUCATIONAL-INFORMATION SYSTEMS IN THE SAUDI ARABIAN HIGH SCHOOLS	88
<i>Amira Modafar Turki ; Mithileysh Sathiyanarayanan</i>	
THE IMPACT OF CULTURE & GENDER ON THE PERCEPTION OF E-COMMERCE PORTALS FOR BRANDED PRODUCTS.....	93
<i>Amira Modafar Turki ; Mithileysh Sathiyanarayanan</i>	
A WEB-BASED PROGRAM OUTCOME ASSESSMENT TOOL	102
<i>Amir A. Khwaja</i>	
ANALYSIS OF ARABIC BOT BEHAVIORS	108
<i>Bayan Boreggah ; Arwa Alrazaq ; Muna Al-Razgan ; Hana Alshabib</i>	
ANALYSIS OF THE ATTACKS ON SAUDI WEB COMPANIES.....	114
<i>Deema Almarri ; Munaira Alhazza ; Moudhi Aljamea ; Maqsood Mahmud</i>	
AN INCREMENTAL CLUSTERED GRADIENT METHOD FOR WIRELESS SENSOR NETWORKS.....	119
<i>Anil Mahmud ; Md. Akhtaruzzaman Adnan ; Md Shopon</i>	
ARABIC TWITTER PROFILING FOR ARABIC-SPEAKING USERS.....	125
<i>Amani Alhozaimi ; Mishari Almishari</i>	
AREA-EFFICIENT ARCHITECTURES OF KASUMI BLOCK CIPHER	131
<i>Yasir ; Ning Wu ; Muhammad Rehan Yahya ; Qiangjia Bi</i>	
AN EVENT DRIVEN WIRELESS SENSORS NETWORK FOR MONITORING OF PLANTS HEALTH AND LARVA ACTIVITIES	137
<i>Areej Sabo ; S. M. Qaisar ; A. Subasi ; K. A. Rambo</i>	

A SAUDI DIALECT TWITTER CORPUS FOR SENTIMENT AND EMOTION ANALYSIS	144
<i>Abdulmohsen Al-Thubaity ; Mohammed Alharbi ; Saif Alqahtani ; Abdulrahman Aljandal</i>	
MAJOR IMPACTS OF KEY REINSTALLATION ATTACK ON INTERNET OF THINGS SYSTEM	150
<i>Asma Terkawi ; Nisreen Innab</i>	
INTERNET OF THINGS (IOT) INCREASING THE NECESSITY TO ADOPT SPECIFIC TYPE OF ACCESS CONTROL TECHNIQUE	156
<i>Asma Terkawi ; Nisreen Innab ; Sara Al-Amri ; Aziza Al-Amri</i>	
ASSEMBLING THE COMPLEXITY OF EMERGING KNOWLEDGE THE PHD PARALLEL PROGRESS PYRAMID (P4)	161
<i>Muhammad Awais ; Marie Manidis</i>	
AN EVENT DRIVEN ATTENDANCE TRACKER	167
<i>Rana Johar ; Saeed Mian Qaisar ; Abdulhamit Subasi ; R. F. Kurdi</i>	
AN ANALYSIS OF AUTISM DISORDER FACTORS USING DIFFERENT CLASSIFICATION TECHNIQUES	173
<i>Maryam Aloumi ; Lilac Alsafadi ; Laila Alayadhi</i>	
LINEAR PROPAGATOR ALGORITHM FOR DIRECTIONS OF ARRIVAL ESTIMATION IN THE PRESENCE OF MUTUAL COUPLING	187
<i>Salem Akkar ; Ferid Harabi ; Ali Gharsallah</i>	
THE IMPACT OF DDOS ON E-COMMERCE	192
<i>Nisreen Innab ; Aziza Al-Amri</i>	
BIG DATA FRAMEWORK FOR HEALTH INFORMATICS : A SOLUTION FOR INFLUENZA SURVEILLANCE IN SAUDI ARABIA	196
<i>Mariam Elhussein ; Hina Gull ; Aeshah Albaid ; Aseel Ajez ; Reem Aldulaijan ; Maryam Alasfoor ; Noura AlGaraawi</i>	
CANCER BIOMARKER RULE DISCOVERY	202
<i>Hala Alshamlan ; Lamia Almoajil ; Khawlah Alabbatn ; Manal Binshalaan ; Rand Almahmoud ; Sara Altuwaijri</i>	
CLASSIFICATION OF LIVE SCANNED FINGERPRINTS USING HISTOGRAM OF GRADIENT DESCRIPTOR	207
<i>Fahman Saeed ; Muhammad Hussain ; Hatim A Aboalsamh</i>	
CLUSTER BASED AND ADAPTIVE POWER CONTROLLED ROUTING PROTOCOL FOR UNDERWATER WIRELESS SENSOR NETWORKS	212
<i>Aasma Khan ; Nadeem Javaid ; Ghazanfar Latif ; Landing Jatta ; Aisha Fatima ; Wahab Khan</i>	
COLLABORATIVE BUILDINGS-TO-CLOUD COMMUNICATION AND COMPARISON OF SERVICE BROKER POLICIES IN SMART GRID	218
<i>Rahim Ullah ; Ayesha Amjid ; Nadeem Javaid ; Muhammad Bilal ; Aziz Ur Rehman ; Mahnoor Khan</i>	
COUNTERING TERRORISM INCITEMENT OF TWITTER PROFILES IN ARABIC-CONTEXT	224
<i>Haya Alghofaili ; Mishari Almishari</i>	
CRITICAL SUCCESS FACTORS FOR LEARNING MANAGEMENT SYSTEM IMPLEMENTATION: NON-SCIENTIFIC COLLEGES CASE A CONCEPTUAL MODEL	229
<i>Weam Alkarney ; Majed Albraithen</i>	
DESIGNING A FLEXIBLE ARCHITECTURE BASED ON MOBILE AGENTS FOR EXECUTING QUERY IN CLOUD DATABASES	235
<i>Salah Telaihan Alshammari ; Fathy Eassa</i>	
SECURITY RELATED ISSUES IN SAUDI ARABIA SMALL ORGANIZATIONS: A SAUDI CASE STUDY	241
<i>Dhoha Almubayedh ; Mashael Al Khalis ; Ghadeer Alazman ; Manal Alabdali ; Rouqaiyah Al-Refai ; Naya Nagy</i>	
A SERVICE ORIENTED ARCHITECTURE BASED COMPREHENSIVE SMART CALENDAR FOR SCHEDULING AND MANAGING REAL-TIME EVENTS	247
<i>Ahmad Raza Khan ; Omar Hamad Alatiyyah ; Khalid Abdulaziz Aljadaan</i>	
CLASSIFICATION OF PARKINSON'S DISEASE USING NNGE CLASSIFICATION ALGORITHM.	251
<i>Ebtiesam J. Alqahtani ; Fatimah H. Alshamrani ; Hajra F. Syed ; Sunday O. Olatunji</i>	
SURVEY ON ALGORITHMS AND TECHNIQUES FOR INDOOR NAVIGATION SYSTEMS.	258
<i>Ebtiesam J. Alqahtani ; Fatimah H. Alshamrani ; Hajra F. Syed ; Fahd A. Alhaidari</i>	
EDGE DETECTION FOR A CHILDREN'S COLORING APPLICATION	267
<i>Hessah Alsaaran ; Ahad Almohanna ; Reem Al-Otaibi ; Leena Al-Hosan</i>	
AN EFFICIENT ABNORMALITY CLASSIFICATION FOR MAMMOGRAM IMAGES	273
<i>Tarek Abudawood ; Fares Al-Qunaieer ; Saud Alrshoud</i>	
HYBRID SYSTEM BETWEEN ANOMALY BASED DETECTION SYSTEM AND HONEYPOD TO DETECT ZERO DAY ATTACK	279
<i>Nisreen Innab ; Eman Alomairy ; Lamya Alsheddi</i>	

PERCEIVED BARRIERS AND DRIVERS OF HEALTH INFORMATION SYSTEMS ADOPTION BY PUBLIC HOSPITALS IN ALHASA	284
<i>Eman Ahmed Al Taisan ; Mohamed E. Seliaman</i>	
EMOJI-BASED SENTIMENT ANALYSIS OF ARABIC MICROBLOGS USING MACHINE LEARNING.....	289
<i>Sadam Al-Azani ; El-Sayed M. El-Alfy</i>	
ENERGY AWARE APPROACH FOR UNDERWATER WIRELESS SENSOR NETWORKS SCHEDULING: UMOD LEACH	295
<i>Abrar S. Alhazmi ; Abdellatif I. Moustafa ; Fahd M. Aldosari</i>	
ENHANCING AN AVAILABILITY OF CLOUD BASED ON FAULT TOLERANCE TECHNIQUES.....	300
<i>Yousef S Alraddadi Safaa ; Saleem S Alraddadi Faisal</i>	
EVENT-DRIVEN SMART LIGHTING AND SURVEILLANCE SYSTEM: A KSA PERSPECTIVE.....	305
<i>S. Al-Subaie ; L. Jambi ; R. A. Reda ; S. M. Qaisar</i>	
EXPLOITATION OF THE PROMISING TECHNOLOGY: USING BLOCKCHAIN TO ENHANCE THE SECURITY OF IOT.	310
<i>Bayan Hazaa Aldoaies ; Haya Almagwashi</i>	
A NOVEL ROUTING ALGORITHM FOR INTER-GROUP LOAD BALANCING IN WIRELESS MESH NETWORKS	316
<i>Fakir Mashuque Alamgir ; Faisal Ahmed ; Mamun Miah ; Hossain Mohammad ; Shourov Barua</i>	
MAXIMIZING RELIABILITY OF HETEROGENEOUS DISTRIBUTED SYSTEM USING AN ADAPTED DISCRETE FLOWER POLLINATION ALGORITHM FOR TASK ALLOCATION PROBLEM.....	320
<i>Farid Abbache ; Hamoudi Kalla</i>	
A FRAMEWORK FOR E-LEARNING SYSTEM UTILIZATION ANALYSIS	326
<i>Abdulsalam Murtala ; Maryam Ahmed ; Sanni Shamsudeen Ademola</i>	
NOVEL SYBIL DEFENSE SCHEME FOR PEER-TO-PEER APPLICATIONS	333
<i>Fuad Shamieh ; Roa Alharbi</i>	
ON COMPARATIVE STUDY FOR QUANTIFIED LEARNING CREATIVITY VERSUS BEHAVIORAL SWARM INTELLIGENCE (NEURAL NETWORKS' APPROACH).....	341
<i>Mustafa M. H. Hassan ; Fadhel Ben Tourkia</i>	
DESIGN OF X-BAND CYLINDRICAL CONFORMAL SUBSTRATE INTEGRATED WAVEGUIDE SLOT ANTENNA ARRAY	350
<i>Hisham Khalil ; M. Mansoor Ahmed ; Umair Rafique ; Saeed-Ur-Rehman ; Muhammad Latif ; Waseem Nazar</i>	
A COMPARISON STUDY BETWEEN TETRAHEDRAL MESH AND HEXAHEDRAL MESH.....	354
<i>Huda S. Basloom</i>	
INTELLIGENT REAL-TIME INTERVENTION SYSTEM APPLIED IN SMART CITY	360
<i>Loai Kayed B. Melhim ; Mahdi Jemmali ; Mafawez Alharbi</i>	
INTRUSION DETECTION IN SMART GRID USING DATA MINING TECHNIQUES	365
<i>Abdulhamit Subasi ; Khloud Al-Marwani ; Reem Alghamdi ; Aisha Kwairanga ; Saeed M. Qaisar ; Malak Al-Nory ; Khulood A. Rambo</i>	
ISMSS IN OUTSOURCING CONTEXT	371
<i>Moneef Almutairi ; Stephen Riddle</i>	
WEBSITE SECURITY ANALYSIS: VARIATION OF DETECTION METHODS AND DECISIONS	377
<i>Izzat Alsmadi ; Fahad Mira</i>	
CLASSIFYING DIGITAL ARABIC FONTS BASED ON DESIGN CHARACTERISTICS	382
<i>Jehan Janbi</i>	
CHALLENGES FACED BY EDUCATIONAL INSTITUTION IN MIDDLE EAST TO ACCEPT AND IMPLEMENT CLOUD-BASED DATA STORAGE	388
<i>Kusum Yadav ; Afraa Sayah Alshammari ; Sultanah Abdullah Albakri ; Alanoud Mohammad Aljedaeie</i>	
POLICY, LEGAL, LEGISLATION AND COMPLIANCE SAUDI PERSONNEL COMPLIANCE AND ADAPTION TO RECENT SECURITY MEASURES	395
<i>Lamyaa Sami Alsaleem ; Malak Fahad Aldakheel ; Deema Abdullah Alotaibi ; Sarah Ali Alqahtani ; Sara Fawaz Alharbi ; Naya Nagy</i>	
MANFAA FREELANCER APPLICATION	400
<i>Moodhi Abdulrahman Almuhrif ; Ahmad A. Alhamed</i>	
A TRIVIAL APPROACH FOR ACHIEVING SMART CITY: A WAY FORWARD TOWARDS A SUSTAINABLE SOCIETY	406
<i>Bokolo Anthony ; Mazlina Abdul Majid ; Awannis Romli</i>	

AN INSTRUMENT TO MEASURE HUMAN BEHAVIOR TOWARD CYBER SECURITY POLICIES.....	412
<i>Khalid Adnan Alissa ; Hanan Abdullah Alshehri ; Shahad Abdulaziz Dahdouh ; Basstaa Mohammad Alsubaite ; Afnan Mohammed Alghamdi ; Abdulrahman Alharby ; Norah Ahmed Almubairik</i>	
MEASURING PASSIVE ENGAGEMENT WITH HEALTH INFORMATION ON SOCIAL MEDIA.....	418
<i>Fatimah Alhayan ; Diane Rasmussen Pennington ; Sara Ayouni</i>	
A METHODOLOGY FOR ENHANCING SOFTWARE SECURITY DURING DEVELOPMENT PROCESSES.....	423
<i>A. R. Shehab Farhan ; Mostafa G.M. Mostafa</i>	
MINING TWEETS TO INDICATE HIDDEN/POTENTIAL NETWORKS.....	429
<i>Nour Al Oumi ; Lilac Al Safadi ; Henda Chorfi</i>	
ROCK FALL TRAJECTORY PREDICTION SYSTEM FOR ENHANCING TRAFFIC SAFETY.....	436
<i>Mohammed Abaker Hussain ; Magdi Osman Ali ; Abdelzahir Abdelmaboud</i>	
PREDICTING THE SUITABILITY OF IS STUDENTS' SKILLS FOR THE RECRUITMENT IN SAUDI ARABIAN INDUSTRY.....	440
<i>Mona Masad Almutairi ; Mozaherul Hoque Abul Hasanat</i>	
EFFECTIVE UTILISATION OF VLE WITH JOINT MULTINATIONAL POSTGRADUATE PROGRAMME.....	446
<i>Monica Ward ; Nirase Fathima Abubacker</i>	
A REVIEW ON MEDICATION IDENTIFICATION TECHNIQUES FOR VISUALLY IMPAIRED PATIENTS.....	452
<i>Moudhi Ali Almuzaini ; M. Abdullah-Al-Wadud</i>	
MULTI-OBJECTIVE VM PLACEMENT ALGORITHMS FOR GREEN CLOUD DATA CENTERS: AN OVERVIEW.....	458
<i>Hanan Ali A-Shehri ; Khaoula Hamdi</i>	
ON SIMULATING INTERNET OF VEHICLES.....	466
<i>Nagwan M. Abdelsamee ; Shuroog S. Alsaleh ; Abeer Algarni</i>	
IOT BASED SOLUTION FOR TELECONSULTING CARDIAC PATIENTS IN SAUDI ARABIA.....	475
<i>Nagwan M. Abdelsamee ; Abeer Algarni</i>	
EXPERIMENTAL SETUP OF SMART TRAFFIC CONTROL USING WIRELESS SENSOR NETWORKS.....	479
<i>Nagwan M. Abdelsamee ; Hanoof Alsulaimani ; Nouf Albatati</i>	
THE DARK SIDE OF DIGITAL TECHNOLOGIES.....	486
<i>Nahier Aldhafferi</i>	
NAMED ENTITY RECOGNITION USING WORD-EMBEDDING TECHNIQUES FOR ARABICWEB16: AN EMPIRICAL STUDY.....	492
<i>Sharefah Al-Ghamdi ; Mashael Al-Duwais ; Hend Al-Khalifa ; Abdulmalik Al-Salman</i>	
NARMA-L2 NEURO CONTROLLER FOR SPEED REGULATION OF AN INTELLIGENT VEHICLE BASED ON IMAGE PROCESSING TECHNIQUES.....	499
<i>Abdelaziz Sahbani</i>	
EFFICIENT DATA CLASSIFICATION FOR IOT DEVICES USING AWS KINESIS PLATFORM.....	505
<i>Nasreen Sultana Quadri ; Kusum Yadav</i>	
EVALUATION OF THE EFFECTIVE ANTI-PHISHING AWARENESS AND TRAINING IN GOVERNMENTAL AND PRIVATE ORGANIZATIONS IN RIYADH.....	510
<i>Nisreen Innab ; Haifa Al-Rashoud ; Riham Al-Mahawes ; Wauood Al-Shehri</i>	
THE IMPACT OF PRIVACY POLICIES AWARENESS ON SNAPCHAT SAUDI USERS DISCONTINUOUS USAGE INTENTION	515
<i>Noora Sami Al-Sager ; Mohamed E. Seliaman</i>	
INDIVIDUAL DIFFERENCES AND E-LEARNING ACCEPTANCE AMONG SAUDI STUDENTS.....	521
<i>Nyla Khadam ; Ali Farooq ; Sahar Alwadei</i>	
ODD/EVEN DIFFERENTIAL IMAGE STEGANOGRAPHY APPROACH.....	527
<i>Areej Albishi ; Lamia Almoajil ; Najla Alharbi ; Nouf Alkahtani ; Nouf Jaafar ; Roa Alharbi ; Faisal Alawwad</i>	
OPTIMIZED TWITTER CYBERBULLYING DETECTION BASED ON DEEP LEARNING.....	532
<i>Monirah A. Al-Ajlan ; Mourad Ykhlef</i>	
PATC: PARALLEL ARABIC TEXT CLASSIFIER	537
<i>Mona Alshahrani ; Shurug Alkhailifa</i>	
PERFORMANCE EVALUATION OF RSA AND ELLIPTIC CURVE CRYPTOGRAPHY IN WIRELESS SENSOR NETWORKS	544
<i>Amine Kardi ; Rachid Zagrouba ; Mohammed Alqahtani</i>	
PERSONAL LOANS COMPARISON WEBSITES IN SAUDI ARABIA: CHALLENGES AND PROPOSED SOLUTION.....	550
<i>Muath Alfawzan ; Raad Alturki</i>	

POPULARITY PREDICTION IN TWITTER DURING FINANCIAL EVENTS	558
<i>Ghada Amoudi</i>	
PREDICTION OF SENTIMENT ANALYSIS ON EDUCATIONAL DATA BASED ON DEEP LEARNING APPROACH	563
<i>Jabeen Sultana ; Nasreen Sultana ; Kusum Yadav ; Fayed Alfayez</i>	
PREEMPTIVE DIAGNOSIS OF DIABETES MELLITUS USING MACHINE LEARNING	568
<i>Reem A. Alassaf ; Khawla A. Alsulaim ; Noura Y. Alroomi ; Nouf S. Alsharif ; Mishael F. Aljubeir ; Sunday O. Olatunji ; Alaa Y. Alahmadi ; Mohammed Imran ; Rahma A. Alzahrani ; Nora S. Alturayef</i>	
PRIVACY-PRESERVING AUTHENTICATION SCHEME FOR WIRELESS NETWORKS	573
<i>Manal Hazazi ; Yuan Tian ; Mznah Al-Rodhaan</i>	
FACE AND KINSHIP IMAGE BASED ON COMBINATION DESCRIPTORS-DIEDA FOR LARGE SCALE FEATURES.....	579
<i>Rachid Aliradi ; Abdelkader Belkhir ; Abdelmalik Ouamane ; Hassina Aliane ; Abdellah Sellam ; Abdeslam Amrane ; Adel S. Elmaghriby</i>	
A STUDY OF COMPUTER-BASED ICT COMPETENCY IN THE SOCIAL SCIENCE SUB-SECTOR OF THE NIGERIAN HIGHER EDUCATION SYSTEM	585
<i>Rashid S Adisa ; Mulikat Y Adisa ; Tijjani Usman ; Akilu A Barau</i>	
REAL-TIME TWITTER SENTIMENT ANALYSIS USING 3-WAY CLASSIFIER	591
<i>Alaa S. Al Shammari</i>	
REVERSIBLE WATERMARKING FOR THE SECURITY OF MEDICAL IMAGE DATABASES.....	594
<i>Fatima Abbasi ; Nisar Ahmed Memon</i>	
A REVIEW OF CRIME ANALYSIS AND VISUALIZATION. CASE STUDY: MARYLAND STATE, USA	600
<i>Sahar Bayoumi ; Sarah Aldakhil ; Eman Alnakhilan ; Ebtehal Al Taleb ; Hana Alshabib</i>	
REVIEW OF PHOTONIC AND HYBRID ON CHIP INTERCONNECTS FOR MPSOCS IN IOT PARADIGM	606
<i>Muhammad Rehan Yahya ; Ning Wu ; Gaizhen Yan ; Yasir Yasir</i>	
A REVIEW ON SCIENTIFIC VISUALIZATION. CASE STUDY: BREAST CANCER.....	612
<i>Sahar Bayoumi ; Munirah Alghamlas ; Asma Alshehri ; Maitha Alruthae</i>	
RISE OF BIG DATA – ISSUES AND CHALLENGES	617
<i>Bayan Alabdullah ; Natalia Beloff ; Martin White</i>	
POLICY, LEGAL, LEGISLATION & COMPLIANCE RISKS THAT ARE CAUSED BY THE ABSENCE OF POLICIES	623
<i>Asayel Alabdullatif ; Alhanoof Alharbi ; Kholood Alajaji ; Fatima Alamoudi ; Razan Albrahim ; Naya Nagy</i>	
DESCRIPTION OF SECURITY IMPACT OF DRONES CHALLENGES AND OPPORTUNITIES	628
<i>Mohammed Nour A. Sabra ; Hamza Wridan ; Nasser M. Alkhatahi ; Fahad Al-Harby</i>	
DESIGN OF SUPER-WIDE BAND ANTENNA WITH SINGLE NOTCH CHARACTERISTIC	633
<i>Saeed Ur Rahman ; Quensheng Cao ; Naveed Ullah ; You Li</i>	
DESIGNING A FLEXIBLE ARCHITECTURE BASED ON MOBILE AGENTS FOR EXECUTING QUERY IN CLOUD DATABASES	637
<i>Salah Telaihan Alshammari ; Fathy Eassa</i>	
A NOVEL (K, X)-ISOMORPHISM METHOD FOR PROTECTING PRIVACY IN WEIGHTED SOCIAL NETWORK.....	643
<i>Sarah Al-Kharji ; Yuan Tian ; Mznah Al-Rodhaan</i>	
SAUDI MOOD: A REAL-TIME INFORMATIVE TOOL FOR VISUALIZING EMOTIONS IN SAUDI ARABIA USING TWITTER.....	649
<i>Tahani Almanie ; Alanoud Aldayel ; Ghaida Alkanhal ; Lama Alesmail ; Manal Almutlaq ; Ruba Althunayan</i>	
SCRUM SOFTWARE MAINTENANCE MODEL: EFFICIENT SOFTWARE MAINTENANCE IN AGILE METHODOLOGY	655
<i>Fateh Ur Rehman ; Bilal Maqbool ; Muhammad Qasim Riaz ; Usman Qamar ; Muhammad Abbas</i>	
TOWARDS A FRAMEWORK FOR THE EXPANSION OF MOBILE COMPUTING IN LEARNING IN KUWAITI HIGHER EDUCATION: THE COMPARATIVE AND FIELD STUDY.....	660
<i>Abdullah Alturki ; Peter Blanchfield</i>	
SECURE SIGN: SIGNING DOCUMENT ONLINE	665
<i>Al Anood K. Alzahrani ; Malak K. Alfossail ; Maryam M. Aldossary ; Muneera M. Almuhaidib ; Sarah T. Alqahtani ; Nazar A. Saqib ; Khalid A. Alissa ; Norah A. Almubairik</i>	
SERVICE ORIENTED SOFTWARE ENGINEERING (SOSE):A SURVEY AND GAP ANALYSIS	668
<i>Felwah Al-Hamed ; Sara Al-Dowesh ; Rana Al-Omar ; Wejdan Al-Dowesh ; Abeer Najjar</i>	
ENSURING PRIVACY PROTECTION OF THE USERS OF E-COMMERCE SYSTEMS.....	674
<i>Shahad Almuzairei ; Sara Alarabi ; Nisreen Innab</i>	

TWO LEVEL BASED PRIVACY PROTECTION APPROACH FOR INTERNET OF THINGS USERS IN CLOUD COMPUTING.....	680
<i>Shatha Alarabi ; Shahad Almuzeri ; Sara Alaradi ; Nisreen Innab</i>	
OPINION REASON MINING: IMPLICIT ASPECTS BEYOND IMPLYING ASPECTS	686
<i>Shehzad Khalid ; Muhammad Haseeb Aslam ; Muhammad Taimoor Khan</i>	
AN ENHANCED SOCIOPSYCHOLOGICAL-BASED TRUST MODEL FOR BOOSTING SECURITY IN WIRELESS SENSORS NETWORKS	691
<i>Mohammed Mahdi Alqhatani ; Mostafa G. M. Mostafa</i>	
A MANUAL MOBILE PHONE FORENSIC APPROACH TOWARDS THE ANALYSIS OF WHATSAPP SEVEN-MINUTE DELETE FEATURE	699
<i>Somaya Adwan ; Fahad Salamah</i>	
STOCK MARKET FORECAST USING MULTIVARIATE ANALYSIS WITH BIDIRECTIONAL AND STACKED (LSTM, GRU).....	704
<i>Khaled A. Althelaya ; El-Sayed M. El-Alfy ; Salahadin Mohammed</i>	
A STRONG AND PRACTICAL AUTHENTICATION MECHANISM USING PASSTEXT AND OTP.....	711
<i>Ghadeer M. Al-Sahwan ; Ghena T. Al-Ghussein ; Maram I. Al Qasim ; Nouf M. Alshehri ; Reem Z. Alhawaj ; Abdullah M. Almuhaideb ; Naya M. Nagy ; Nazar A. Saqib ; Norah A. Almubairik</i>	
SEMG SIGNAL CLASSIFICATION USING DWT AND BAGGING FOR BASIC HAND MOVEMENTS.....	719
<i>Abdulhamit Subasi ; Arub Alskandarani ; Asma Alsheikh Abubakir ; Saeed M. Qaisar</i>	
SUITABLE LMS CONTENT AND FORMAT FOR TRAINING	725
<i>Saleh Ramadhan Alghamdi ; Anass Bayaga</i>	
A COMPREHENSIVELY SECURE SMART CARD ACCESS CONTROLS.....	732
<i>Sulaiman Alazmi ; Ahmad Raza Khan ; Qian Yu</i>	
DETECTING ZERO-DAY POLYMORPHIC WORM: A REVIEW	736
<i>Sulieman Mohamed Ali Sulieman ; Yahia A. Fadlalla</i>	
SURVEY ON STEPS OF TRUTH DETECTION ON ARABIC TWEETS	743
<i>Rabeaa Mouty ; Achraf Gazdar</i>	
THE DEVELOPMENT OF AN EARTHQUAKE EARLY WARNING SYSTEM USING AN ADXL335 ACCELEROMETER.....	749
<i>Emir Husni ; Folkes Laumal</i>	
THE “STUXNET” VIRUS OF 2010 AS AN EXAMPLE OF A “APT” AND ITS “RECENT” VARIANCES	754
<i>Sumayah Al-Rabiahah</i>	
TOWARD AUTOMATED SOFTWARE REQUIREMENTS CLASSIFICATION.....	759
<i>Hala Alrumanah ; Abdulrahman Mirza ; Hessah Alsalamah</i>	
TOWARDS A PROXIMITY-AWARE, ACCESSIBLE AND PERSONALIZED PUBLIC DIGITAL TERMINAL AN INITIAL STUDY	765
<i>Mohammed Misbhauddin ; Majed Alshamari</i>	
TOWARDS LANGUAGE-INDEPENDENT SENTIMENT ANALYSIS	771
<i>Tarek Abudawood ; Heelah Alraqibah ; Waleed Alsanie</i>	
UNDERSTANDING THE IMPACT OF RANSOMWARE: A SURVEY ON ITS EVOLUTION, MITIGATION AND PREVENTION TECHNIQUES	777
<i>Najla Aldaraani ; Zeenat Begum</i>	
UNPACKING PRIVACY PRACTICES IN SNSS: USERS’ PROTECTION STRATEGIES TO ENFORCE PRIVACY BOUNDARIES	782
<i>Fatima Asiri ; David Millard</i>	
URNEXT : A PROPOSED LOCATION-AWARE PATIENT QUEUING SOLUTION USING BLE TECHNOLOGY	788
<i>Reham Alabduljabbar ; Rawan Bin Madhi ; Hind Medan ; Nada Alqaqeel ; Munira Alsubaie</i>	
USING DESIGN THINKING IN INFORMATION SYSTEM DEVELOPMENT: A SURVEY	791
<i>Fahad Alahmari ; M. Anandhavalli</i>	
VISUALIZATION OF FIRE ACCIDENTS IN SAUDI ARABIA	797
<i>Sahar Bayoumi ; Khulood Alghamdi ; Dalal Alqusair ; Abeer Alfutamani</i>	
VREDU: A FRAMEWORK FOR INTERACTIVE IMMERSIVE LECTURES USING VIRTUAL REALITY	803
<i>Mohammed Misbhauddin</i>	
VULNERABILITIES AND EXPLOITATION OF UNIVERSITIES’ REGISTRATION TOOLS	809
<i>Norah Saad Al-Serhani ; Cady Abdulelah Alnafea ; Fatima Fathallah Al-Yousif ; Maisaa Mohammad Al-Ghuwainim ; Sakinah Rashed Alshaer ; Naya Nagy</i>	

CLUSTERING OF HUMAN INTESTINE MICROBIOMES WITH K-MEANS	814
<i>Wesam Sami Taie ; Yasser Omar ; Amr Badr</i>	
MILLIMETER WAVE SWITCHING IN RADIO OVER FIBER NETWORKS USING SEMICONDUCTOR OPTICAL AMPLIFIER (SOA).....	820
<i>Yazan A. Alkhlefat ; Amr Ragheb ; Maged A. Esmail ; Saleh Alshebeili</i>	
Author Index	