DeSE

www.dese.org.uk

PROGRAMME

10TH INTERNATIONAL CONFERENCE
ON
DEVELOPMENTS in eSYSTEMS ENGINEERING

14TH JUNE - 16TH JUNE

2017

PARIS

e-Learning (Technology Enhanced Learning)
e-Systems and AI
e-Business and Management
e-Government systems and Autonomic Computing
e-Heath and e-Medicine
e-Science and Technology
e-Entertainment and Creative Technologies
e-Security and e-Forensics
e-Networking and Wireless Environments
e-Ubiquitous Computing and Intelligent Living
Green and Sustainable Technologies +
e-Systems Engineering (Man Stream)
e-Culture and Digital Society
Advanced Interaction Technology
Intelligent Techniques in Cancer Research
Environmental Health
Clinical and Healthcare Knowledge Management

PARIS, 2017

IEEE

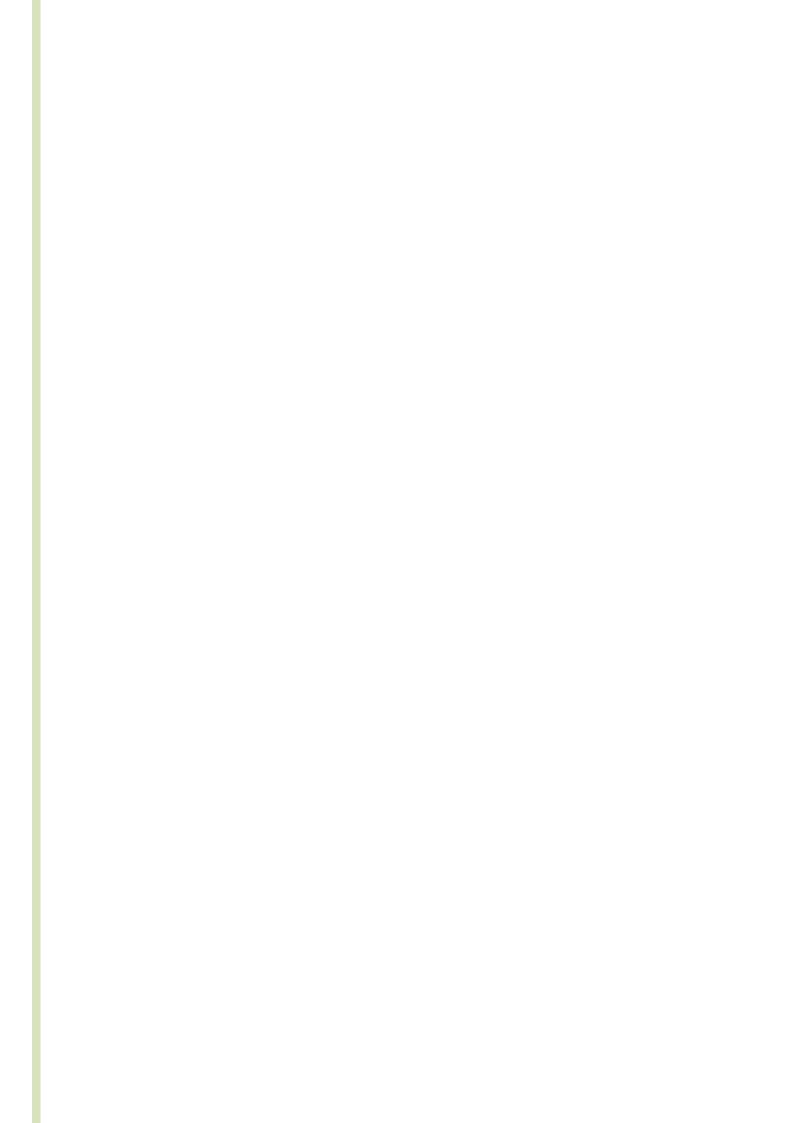IEEE computer society

Foreword

Now in its tenth year, the Developments in e-Systems Engineering (DeSE) series of conferences has firmly established an exciting, stimulating, and essential forum for the exchange and advancement of ideas in e-Systems. The establishment of this conference series has brought about an ever widening scope of cross-disciplinary participation, bringing e-Systems developers, from all fields, into a common research area. DeSE 2017 is sponsored by the Institute of Electrical and Electronics Engineers (IEEE) and organised jointly by CentraleSupélec, Université Paris-Saclay, and Liverpool John Moores University in collaboration with a number of national and international partners. The conference series was established by a consortium of UK universities in 2008 as a forum for the development, analysis, and future guidance on the burgeoning number of e-system projects and applications.

DeSE 2017 returns to Paris, building upon the success and dissemination of research of previous conference iterations (Liverpool and Leeds 2016, Dubai 2015, Paphos 2014, Abu Dhabi 2013, Bucharest 2012, Dubai 2011, London 2010, Abu Dhabi 2009 and Liverpool 2008), furthering the ideas of e-Systems development. Currently, there is a vast quantity of interest in the field of e-Systems, resulting in a wide array of research being conducted in order to transfer services and facilities into state-of-the-art electronic technologies. This year's conference presents a multitude of topics aimed at addressing current research issues and trends in the design, engineering, and adoption of e-Systems. This year's conference outlines 12 research tracks, which are: e-System Engineering, e-Learning (Technology Enhanced Learning), e-Government systems, Autonomic Computing and AI, e-Business and Management, e-Health and e-Medicine, e-Science and Technology, e-Security and e-Forensics, e-Entertainment and Creative Technologies, e-Networking and Wireless Environments, e-Ubiquitous Computing and Intelligent Living, Green and Sustainable Technologies , e-Culture and Digital Society. In addition, unique workshops have been organised and will run in conjunction with the conference: Special Session on Internet of Everythings (IoE), Advanced Robotics and Machine learning and neuroscience applied to real world learning and self-development.

We also welcome three keynote speakers, covering a range of relevant, innovative topics that promise to be exciting and thoroughly engaging.

The standard and breadth of this year's accepted papers is exceptional, validating the importance of the continual availability of DeSE as a major event and forum for the promotion and discussion of e-Systems development. Presentations will be delivered by delegates from a vast number of countries including: USA, UAE, Saudi Arabia, Jordan, Iraq, India, France, United Kingdom, Algeria, Ukraine, South Africa, Taiwan, Russia, Italy, Malaysia, Japan, Morocco, Senegal, Afghanistan, Greece, China and New Zealand. We would like to thank the speakers and session chairs for their time and effort, and the authors for their contribution to an excellent programme. We hope that you enjoy DeSE 2017 and have a great time in Paris, France. The series will move to Edinburgh, UK for DeSE 2018.

Finally, we would like to thank the Local Organising Committee and the Technical Programme Committee for all their hard work in helping to make this event a success.

DeSE2017 Committees

General Chair

Prof. Hani HAMDAN
CentraleSupélec, Université Paris-Saclay
Laboratoire des Signaux et Systèmes
L2S UMR CNRS 8506
3 rue Joliot Curie
91190 Gif-sur-Yvette
FRANCE

Conference Series Chairs

Dr. Dhiya Al-Jumeily, UK
Dr. Abir Hussain, UK
Prof. Hissam Tawfik, UK

TPC Chairs

Dr. Tom Dawson, UK
Prof. Panos liatsis, UAE
Dr. Naeem Radi, UAE

Publicity Chair

Mr Faouzi Hidoussi, Qatar

International Steering Committee Chair

Dr. Saad Ali Amin, UK

International Steering Committee

Prof. Isa Qamber, Bahrain
Prof. Ilshat Gafurov, Russia
Prof. Mohamed Alhamadany, Iraq
Prof. Jamila Mustafina, Russia
Prof. Paulo Lisboa, UK
Dr. Husam Al-Ulama, UAE

Dr. Khalid Battal Najim, Iraq
Prof. Madjid Merabti, UAE
Prof. Abdulla Al Ani, Oman
Prof. Rozaida Ghazali, Malaysia
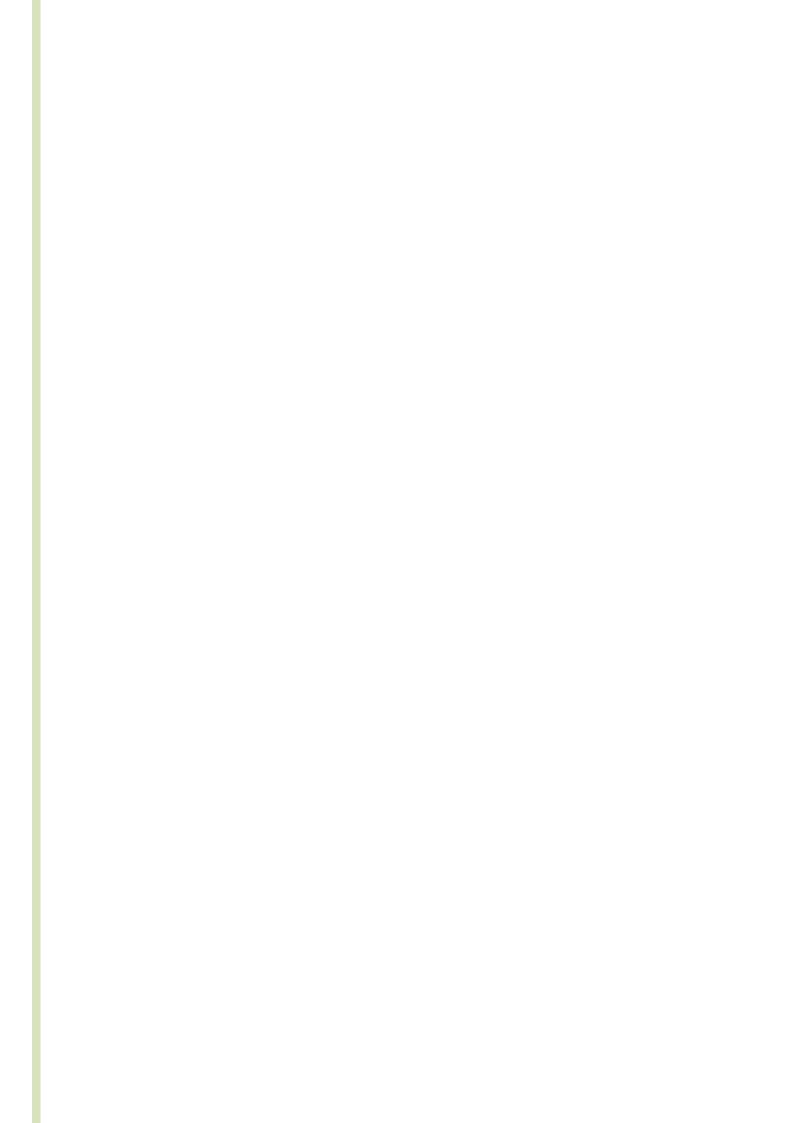Prof. Atulya Nagar, UK
Prof. Ivan Evgeniev Ivanov, Bulgaria

Asmaa Mahdi

Jamila Mustafina

Mona Nandwani

Mamadou Lamine Ndiaye

Muthu Ramachandran

Sattar Sadkhan

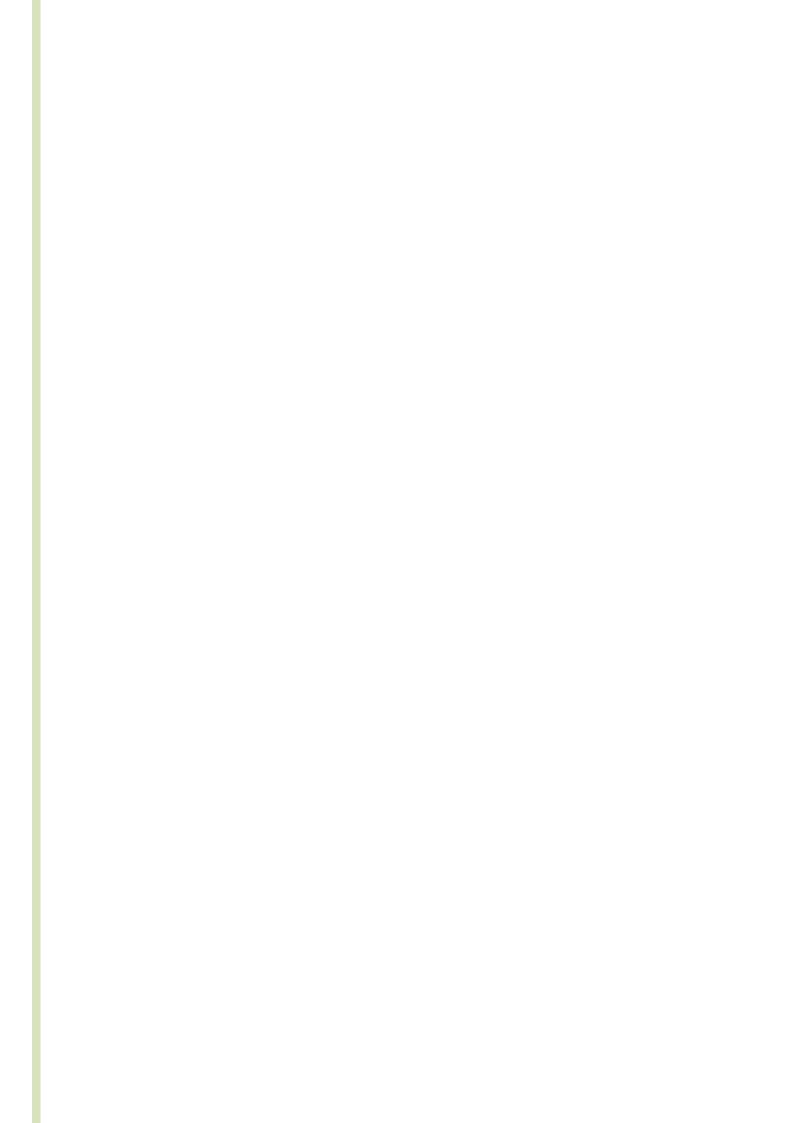El Yahyaoui El Idrissi Selma

Thar Shamsa

Andy Symons

Stephen Tang

Hissam Tawfik

Mark Taylor

Akeel Thulnoon

Christopher Wren

Megha Yaligar

Aufar Zakiev

SCHEDULE-AT-A-GLANCE

WEDNESDAY	THURSDAY	FRIDAY
8.00 - 10.00 Registration & Coffee	**8.00 - 9.00** Registration & Coffee	**8.00 - 9.00** Registration & Coffee
	9.00 - 10.30 Session 3: e-Security and e-Forensics	**9.00 - 9.45** Session 6: Special Session Internet of Everythings (IoE)
10.00 - 10.30 **Welcome Speeches**		**09.45 - 10.30** Session 7: e-Networking and Wireless Environments
10.30 - 11.00 Coffee Break	**10.30 - 11.00** Coffee Break	**10.30 - 11.00** Coffee Break
11.00 - 12.00 Keynote Speaker **Dr. Majeed Soufian**	**11.00 - 12.00** Keynote Speaker **Dr. Fanny Klett**	**11.00 - 12.00** Session 8: e-Health and e-Medicine
12.00 - 13.30 Lunch	**12.00 - 13.30** Lunch	**12.30 - 13.30** Lunch
13.30 - 14.30 Session 1: eSystems Engineering I	**13.30 PM - 14.30 PM** Session 4: e-Learning I	**13.30 - 14.30** Session 9: e-Government systems, Autonomic Computing and AI
14.30 - 15.00 Coffee Break	**14.30 - 15.00** Coffee Break	**14.30 - 15.00** Coffee Break
15.00 - 16.00 Keynote Speaker **Dr. Latif Ladid**	**15.00 - 16.00** Keynote Speaker **Dr. Victor Chang**	**15.00 - 16.00** Session 10: e-Learning II
16.00 PM - 17.00 Session 2: Special Session Machine learning and neuroscience applied to real world learning and self-development	**16.00 - 17.15** Session 5: Special Session Advanced Robotics	**16.00 - 17.30** Session 11: eSystems Engineering II
		17.30 - 18.00 **Conference Close**

Schedule | Papers

Session 1: e-Systems Engineering I

14/06/17 | 13.30 – 14.30   **Session Chair:** Hani Hamdan

1570348240
Linear Relational Model Between P-Value and Co Relation Value

Neelakantagouda Patil

1570355688
Applying System Science and System Thinking Techniques to BIM Management

Alan Martin Redmond

1570363885
Detecting the Disc Herniation in Segmented Lumbar Spine MR Image Using Centroid Distance Function

Mohammed Khalaf

1570355478
Wearable Devices and IoT as Enablers of Assistive Technologies

Davide Mulfari

1570372159
Adaptive Clustering Based Inclusion and Computational Intelligence for a Fed-Batch Fermentation Process Control

Majeed Soufian

Session 2: Special Session: Machine learning and neuroscience applied to real world learning and self-development

14/06/17 | 16.00 – 17.00   **Session Chair:** Jamila Mustafina
                                             Aydar Kalimullin
                                             Nick Rushby

1570334401
Uncovering Terrorist Attacks Using Machine Learning Approaches

Mustansar Ghazanfar

1570356543
A Fatigue Prediction Cognitive Model for Naturalistic Typing Environment

Ali Al-Ataby

1570356594
Recurrent Neural Network Architectures for Analysing Biomedical Data Sets

Mohammed Khalaf

1570364881
Towards A Hybrid Approach of Self-Organizing Map and Density-Based Spatial Clustering of Applications with Noise for Image Segmentation

Kevin Kam Fung Yuen

1570369777
Visual Editor of Scenarios for Virtual Laboratories

Vlada Kugurakova

Session 3: e-Security and e-Forensics

15/06/17 | 09.00 – 10.30   **Session Chair:** Kevin Kam Fung Yuen

1570362212

Towards a Framework for the Extension and Visualisation of Cyber Security
Requirements in Modelling Languages

Phillip Kendrick

1570336258

A New Approach to Securing Speech Signals

Belmeguenai Aissa

1570356098

Hybrid Classification Approach Using Self-Organizing Map and Back Propagation
Artificial Neural Networks for Intrusion Detection

Sadeq AlHamouz

1570356237

Selecting Scalable Network Features for Infiltration Detection

Phillip Kendrick

1570356238

A Robust Spatially Invariant Model for Latent Fingerprint Authentication Approach

Dhiya Al-Jumeily

1570356500

Enforcing Access Control Models in System Applications by Using Aspect-Oriented
Programming: A Literature Review

Mohammed Khalaf

Session 4: e-Learning I (Technology Enhanced Learning)

15/06/17 | 13.30 – 14.30   **Session Chair:** Liliya Slavina

1570356179

An Adapted Community of Inquiry (COI) Framework with the Inclusion of Instructor
Presence

Elin Eliana Abdul Rahim

1570356180

A Guideline for the Development of Blended Learning Platform Based on the
Observation of Students' Reaction in a Virtual World

Elin Eliana Abdul Rahim

1570355593

Overview on Modern Serious Games for Regional and Minority Languages
Promotion

Jamila Mustafina

1570355629

Distance Learning of Regional Languages: Comparative Analysis (Case Study:
Tatarstan, Bashkortostan, Chuvashia, Udmurtia - Russian National Regions)

Nailya Nurutdinova

1570356476

Towards a Multidimensional Model to Study a Critical Success Factors Affecting
Continuity and Success in E-Learning Systems

Yassine Safsouf

Session 5: Special Session: Advanced Robotics

15/06/17 | 16.00 – 17.15   **Session Chair:** Dhiya Al-Jumeily

1570356138
Spiking Reasoning System

Alexander Toschev

1570365799
Tool for 3D Gazebo Map Construction from Arbitrary Images and Laser Scans

Evgeni Magid

1570365805
Towards DJI Phantom 4 Realistic Simulation with Gimbal and RC Controller in ROS/Gazebo Environment

Evgeni Magid

1570366189
Towards Effective Interactive Teaching and Learning Strategies in Robotics Education

Evgeni Magid

1570366199
Comparing Fiducial Marker Systems Occlusion Resilience Through a Robot Eye

Evgeni Magid

1570372163
Genetic Sensor Placement in Active Control of a Robotic Arm

Majeed Soufian

Session 6: Special Session: Internet of Everythings (IoE)

16/06/17 | 09.00 – 09.45   **Session Chairs:** Salvatore Distefano
                                               Airat Khasianov

1570339090
Smart Orientation for Blind People in e-City

Ivan Seleznov

1570356542
Monitoring the Performance of Solar Street Lights in Sahelian Environment: Case Study of Senegal

Moussa Diallo

1570357691
Mobile Cloud Computing: Challenges and Future Research Directions

Samaher Al-Janabi

Session 7: e-Networking and Wireless Environments

16/06/17 | 09.45 – 10.30   **Session Chair:** Evgeni Magid

1570355396

Supervised Machine Learning Techniques for Social Aware Cognitive Radio Handovers

Anandakumar H

1570346713

Effect of GSM Frequency Band on Received Signal Strength and Distance Estimation from Cell Tower

Viranjay Mohan Srivastava

1570344038

Polarization Insensitive 3D Cylindrical Shaped Frequency Selective Surface

Viranjay Mohan Srivastava

1570356350

In-body Routing Protocols for Wireless Body Sensor Networks

Romaissa Bendjehich

Session 8: e-Health and e-Medicine

16/06/17 | 11.00 – 12.00   **Session Chair:** Jade Hind

1570366766

Privacy Preservation for eSports: A Case Study Towards Augmented Video Golf Coaching System

Boris Ba i ; Qi Meng; Kam Yuk Chan

1570362708

MRI Breast Cancer Automatic Segmentation Using Watershed Algorithm

Hanan Alshanbari

1570364512

Aggregating Heterogeneous Health Data Through an Ontological Common Health Language

Dimosthenis Kyriazis

1570355883

A Novel Choroid Segmentation Method for Retinal Diagnosis Using Deep Learning

Baidaa Al-Bander

1570356071

Computer Stereovision System for 3D Tracking of Free-Swimming Zebrafish

Qussay Al-Jubouri

Session 9: e-Government systems, Autonomic Computing and AI

16/06/17 | 13.30 – 14.30   **Session Chair:** Majeed Soufian

1570355451
A Study on Road Accidents in Abu Dhabi

Omar Kassem Khalil

1570352057
Development of an Interactive System to Enhance Strategic Planning Process and Quality of Aviation Operations Using Balanced Scorecard: A UAE Case Study

Mohamed Alloghani; Nasser AL Shamsi

1570356158
Identifying Actionable Information from Social Media for Better Government-Public Relationship

Himani Garg; Charu Bansal

1570356354
A New Mapping Approach Between XML Schemas in a P2P Environment

El yahyaoui El idrissi Selma

1570370971
BROGO: A New Low Energy Consumption Algorithm for Leader Election in WSNs

Ahcene Bounceur

Session 10: e-Learning II (Technology Enhanced Learning)

16/06/17 | 15.00 – 16.00   **Session Chair:** Fanny Klett

1570337468
The Attitude of Using Mobile Learning Technology Enhanced Teaching

Suparawadee Trongtortam

1570339144
Enhancing Photovoltaic Systems Independent Learning Using e-Learning Tools

Amal Kabalan

1570355276
Regional Languages in Cyberspace (Case Study: Tatarstan, Russia)

Liliya Slavina

Learning analytics in higher education - The path toward educational management intelligent systems

Fanny Klett

1570356160
Electronic Educational Resource "Post-graduate Foreign Language" and the Obtained Learning Curve

Natalya Chernova

Session 11: e-Systems Engineering II

16/06/17 | 16.00 – 17.30   **Session Chair:** Viranjay Mohan Srivastava

1570365745
A Two-Lane Traffic Model Based on Cellular Automata

Shuai Wang

1570356435
Recognition of Individual Zebrafish Using Speed-Up Robust Feature Matching

Qussay Al-Jubouri

1570356465
The FL-SMIA Network: A Novel Architecture for Time Series Prediction

Dhiya Al-Jumeily

1570356324
The Conditions for Database of Social Advertising in Russia

Aigul Khanova

1570354889
Integrated Routing Scheme and Inverter Switch to Develop the Mobile Controlled Energy Saving System

Joy long-Zong Chen

1570354918
Soft Mathematical System to Solve Black Box Problem Through Development the FARB Based on Hyperbolic and Polynomial Functions

Samaher Al-Janabi

1570367333
Impacts and Benefits of Health Informatics in Saudi Arabia: A Weblink Pilot Project

Jade Hind

1570369778
Dynamic Area of Interest Management for Massively Multiplayer Online Games Using OPNET

Sarmad Abdulazeez

New approach toward cybersecurity threads to industrial control systems: Self-Defending Control Systems as Generalisation of Adaptive Controllers

Dr. Majeed Soufian

Senior Lecturer at Leeds Beckett University

Dr Majeed Soufian has a history of successful research collaboration alongside a commitment to teaching, development of young researchers and PhD students. He graduated with a degree in applied physics with major in solid state (NUI), a MSc (UMIST) and PhD (MMU) in Intelligent Control Systems Engineering (Hard & Soft Computing Techniques for nonlinear modelling and control with industrial applications) and he has a MSc in Software Engineering (University of Oxford).

His research collaborations include both academic, industrial and government agency partners. As a lecturer in Industrial Automation at Edinburgh Napier University, he is currently developing a collaboration on Industrial Control System Security (ICS2) and has secured funding for a PhD student to work in this field. He has published over 60 research articles in international conferences and journals with a research interest in industrial automation and its security, modelling, control engineering, robotics, vision, autonomous vehicle navigation, artificial intelligence, data mining and so on with applications ranging from industrial plastic extrusion to fermentation processes and from API (Active Pharmaceutical Ingredients) morphology to medical microbiology.

His reputation and network of international collaboration has led to his chairing of many special sessions at international conferences. His current commitments include a successful bid for a special session on "Industrial Automation and Process Systems Security" in the 26th IEEE international Symposium on Industrial Electronics ISIE'17, and he is now principle organiser and chairman for this special session. He is also a co-chairman for another two special sessions and three tracks at the IEEE-ISIE17 conference. He is in collaboration with iniLabs GmbH (a Swiss spin-off of the Institute of Neuroinformatics at the University of Zurich and the ETH Zurich), KAUST and Vienna University of Technology in developing and secured a new focused session for IEEE SENSORS 2017 conference, i.e.; "Sensors for Smart Living". This includes topics such as sensor development for autonomous vehicle and assisted driving.

He is also invited as Track Co-chair on "Application-Specific CE for Smart Cities" for 36th IEEE International Conference on Consumer Electronics (ICCE 2018) IEEE - ICCE 2018. He has reviewed articles for many scientific publications and sits on the International Editorial Review Board of Artificial Intelligence Research

(AIR).Additionally, he has a long collaboration with the control section of Candu Energy Inc (part of SNC-Lavalin).He holds a number of international patents which he exploited in the design and development of BiocypherÔ system software architecture for rapid typing and identification of pathogens. Furthermore in collaboration with Health Protection Agency (HPA), Clinical lab in MRI hospital, Manchester Medical Microbiology Partnership, a CV and MALDI-ToF-MS instrument manufacturers, he founded and was technical director of Claydon Bioinformatics Ltd. a spin-out company/SME for which he successfully secured a DTI SMART award for the same day identification of MRSA project with an estimated budget of over £1.1M.

His industrial experience also includes establishing and managing an industrial R&D group for design and development of an electro optic sensor for semi-automatic navigation system of an autonomous mobile object and over four years in Numerical Algorithms Group where his expertise were utilised in the development and porting of numerical algorithms with some HPC (High Performance Computing) practices. Additionally he supervised an industrial project for the design and implementation of a multidimensional multivariable control system for an industrial web process after a thorough structural analysis to obtain its analytical model; was involved in the design of an intelligent system for navigation of a mobile robot and synthesised an intelligent controller for a MR Imaging field gradient system (hospital scanners). He also worked as a visiting scientist in STFC (Science and Technology Facility Council), Daresbury Laboratories toward a feasibility study of multi-scale (ranging from Angstrom to meter) modelling and developing a distributed system software for it.

Abstract: Cybersecurity and vulnerability of industrial control systems has a direct link to instability of civilian critical infrastructures such as energy and water. Despite recent threads have highlighted existing associated risks, yet no general countermeasure has developed.

The control system design has dramatically evolved in the last half-century and numerous design strategies have emerged to deal with specific difficulties such nonlinearities, constraints, disturbances in both theory and application domain. For example, anti-windup PID controller was developed in response to input constraint, as gain scheduling was developed to deal with system nonlinearities. Furthermore, information about the process under control, its environments and their associated changes were used to tune the controller parameters accordingly and form adaptive control strategies. The undeniable success of these control design strategies owe to the knowledge provided to the controller in order to cope with undesired changes or disturbances. However, we are now face new challenges and threats due to connecting industrial control systems to the internet and leaving the vulnerable against any cyberattacks. It has widely been shown that firewall and network security cannot keep control system safe against cyber-threats even if they are responsible to control vital public infrastructures, nor any control design has yet developed to survive under such threats.

The aim of this talk is to propose an alternative but practical solution to basic key and common cyber-threats such as overloading (Flooding Attacks) and their associated risks to a typical industrial automation system. For this purpose, countermeasures that can directly be implemented in end-points regardless of any specific hardware or deployment platform are considered here. These proposed solutions include developing new control strategies that can defend associated industrial automation processes and themselves against such attacks, i.e., identifying and building a defence mechanism in control algorithm so they can adapt themselves and hence named self-defending control strategies. For demonstration an example of such control algorithms was developed and simulation results are presented.

The New IPv6-based Internet and its Impact on eSystems and Machine Learning

Dr. Latif Ladid

Founder & President of IPv6 Forum, *www.ipv6forum.org*
Founding Chair of 5G World Alliance, *www.5gworldalliance.org*
Chair, ETSI IPv6 Industry Specification Group, *portal.etsi.org/tb.aspx*
Chair, IEEE ComSoC IoT subcommittee,
cms.comsoc.org/eprise/main/SiteGen/TC_IOT/Content/Home.html
Chair, IEEE ComSoC 5G subcommittee,
cms.comsoc.org/eprise/main/SiteGen/TC_5GMWI/Content/Home.html
Vice Chair, IEEE ComSoC SDN-NFV subcommittee,
cms.comsoc.org/eprise/main/SiteGen/TC_SDN_NFV/Content/Home.html
Emertius Trustee, Internet Society . ISOC, *www.isoc.org*
IPv6 Ready & Enabled Logos Program Board, *www.ipv6ready.org*
World Summit Award Board Member, *www.wsis-award.com*
Research Fellow @ University of Luxembourg on multiple European Commission Next Generation Technologies IST Projects
. Member of 3GPP PCG (Board), *www.3gpp.org*
. Member of 3GPP2 PCG, *www.3gpp2.org*
. Member of UN Strategy Council
. Member of Future Internet Forum EU Member States (representing Luxembourg)

Abstract: The public IPv4 address space managed by IANA(http://www.iana.org) has been completely depleted back in Feb 1st 2011. This creates by itself a critical challenge when adding new systems and enabling machine learning services on the Internet. Without publicly routable IP addressing, the Internet of Systems, and anything that's part of Machine Learning services on the Internet, would be greatly reduced in its capabilities and then limited in its potential success. Most discussions of IP over everything have been based on the illusionary assumption that the IP address space is an unlimited resource or it's even taken for granted that IP is like oxygen produced for free by nature. The introduction of IPv6 provides enhanced features that were not tightly designed or scalable in IPv4 like IP mobility, end to end (e2e) connectivity, ad hoc services, etc. IPv6 will be addressing the extreme scenarios where IP becomes a commodity service. This new address platform will enable lower cost network deployment of large scale sensor networks, RFID, IP in the car, to any imaginable scenario where networking adds value to commodity.

IPv6 deployment is now in full swing with some countries achieving over 50% penetration such as Belgium. The US has some 80 Million users using IPv6 without even the users knowing it. Recently, Apple has required its apps developers to use IPv6 only for their apps starting from June 1st 2016, which is a great shot in the arm of IPv6. There are many inflections happening this decade to influence the design of the first tangible IoT, 5G and Smart Cities. It will be a combination of IoT, SDN-NFV, Cloud Computing, Edge Computing, Big IoT Data, and 5G, to sift through to realizing the paradigm shift from current research-based work to advanced IoT, 5G, and Smart Cities. This talk will be devoted to analyze the transformative societal impact of IPv6 on the potential mix of IPv6-based eSystems, Machine Learning, IoT, SDN-NFV, Cloud Computing, Big Data, and 5G and its advanced features, highlighting the challenges and the solutions moving forward.

Big Data and Intelligent Technologies -
Does Industry 4.0 Call for Higher Education 4.0?

Dr. Fanny Klett, IEEE Fellow, Director

German Workforce ADL Partnership Laboratory, Germany
Email: fanny.klett.de@adlnet.gov

Dr. Fanny Klett assumed the Directorship of the German Workforce Advanced Distributed Learning Partnership Laboratory, which is run in cooperation with the US Government, in 2009. Prior to this position, she has been with leading research institutions in principal positions. Fanny Klett is regularly invited as Visiting Professor and Distinguished Lecturer at universities worldwide. Her research addresses advanced solutions in the areas of information, data and content management, business intelligence, data mining, competency and performance management, and interoperability. Dr. Klett actively works in standardization bodies, such as IEEE Learning Technology Standards Committee, US Advanced Distributed Learning Initiative, and is CEN WS-LT LTSO expert. She chaired and served on more than 30 conference planning and program committees of UNESCO, IEEE, APSCE, among others. Fanny Klett is associated editor of IEEE publications, Member of the Advisory Board of the Knowledge Management and E-Learning International Journal as well as the Editorial Board of the Global Chinese Society for Computers in Education. In addition, she assists various industrial and governmental research sponsoring organizations worldwide, as an expert. Dr. Klett is IEEE Fellow.

Abstract: Wireless and network technologies, the Internet of Things, the Internet of Everything, cloud computing, decision support systems and artificial intelligence are only few of the solutions toward products and services that are foreseen to become increasingly integrated into the industrial value chain addressing a recent trend toward Smart Factories of the future. This trend led to coining the term Industry 4.0, and despite many controversial views, it has initiated a broad discussion about a next industrial revolution. Also governments are more and more looking at intelligent technologies as enabler to solve the rising urbanization issues, make the cities smarter, and comfortable in the context of transport, climate, food, energy, health, and education, and contribute to a sustainable development. In view of this expansion of intelligent technologies, a need for a qualified and retaining competitive workforce has been established, and Higher Education organizations started to experience the force of the global economy, too, indicating recently an essential demand for strategic deployment of intelligent technologies in complex administrative, decision making, and quality control processes, to ensure the retention of students, among other goals.

Against this background, this talk addresses the questions increasingly raised in our Knowledge Economy: Are graduates prepared for industrial and market needs? Is Higher Education prepared to meet the demands of rapid technological transformations, such as Smart Cities, and Industry 4.0?

Taking into account the continuously growing amount of accessible data as well as the opportunity to combine data from various sources, manage and intelligently analyze the data, the talk is dedicated to an emerging area of research covering models and systems based on big data, business intelligence and analytics toward the establishment of a strong and smart linkage between academia, industry and government. It deals with ICT-enabled strategies to better align academia, industry and government by adhering to high market dynamics and social infrastructure, and to resolve many issues attributable to the fast changing conditions of the global employment market as well as the achievement of successful career development and beneficial workforce performance.

Recent development, challenges and recommendations from Internet of Things and Data Science

Dr. Victor Chang

Dr. Victor Chang is an Associate Professor in Information Management and Information Systems and also a Director of PhD Programme at International Business School Suzhou (IBSS), Xi an Jiaotong Liverpool, China. Dr. Victor Chang was a Senior Lecturer in Computing at Leeds Beckett University, UK and a Visiting Researcher at the University of Southampton, UK. He has been a technical lead in web applications, web services, database, grid, cloud, storage/backup, bioinformatics, financial computing which subsequently have become his research interests. Victor has also successfully delivered many IT projects in Taiwan (place of birth), Singapore, Australia, and the UK since 1998. Victor is experienced in a number of different IT subjects and has 27 certifications with 97% on average. He completed PGCert (Higher Education, University Greenwich, 2012) and PhD (C.S, University of Southampton, 2013) within four years while working full-time, whereby the distance between his work and research is about hundreds of miles away. He has over 100 published peer-reviewed papers, including several high-quality journals up-to-date. Victor won £20,000 funding in 2001 (Singapore-Cambridge Trust) and £81,000 funding in 2009 (Department of Health). He was involved in part of the £6.5 million project in 2004, part of the £5.6 million project in 2006 and part of a £300,000 project in 2013. He also won another £200,000 to support his scholarly activities. He is a PI and Co-PI in some projects. Victor is a winner in 2011 European Identity Award in On Premise to Cloud Migration. He has won a prestigious European award, Best Project in Research, at the European Cloud and Identity Award in 2016. He was selected to present his research at the United Nations in 2003 and at the House of Commons, UK, in 2011. He won the best papers in 2012 and 2015. Dr Victor Chang has taught numerous undergraduate and postgraduate modules since Year 2011. In some modules he taught, students like his teaching and enjoy his labs and lectures.

Dr Victor Chang is leading expert on Cloud Computing, Big Data, Internet of Things and Security. He has demonstrated Storage as a Service, Health Informatics as a Service, Financial Software as a Service, Education as a Service, Big Data Processing as a Service, Integration as a Service, Security as a Service, Social Network as a Service, Data Visualization as a Service (Weather Science) and Consulting as a Service in Cloud Computing and Big Data services in both of his practitioner and academic experience. The contributions that he has offered will be published in high-quality journals. Additionally, his proposed frameworks have been adopted by several organisations. In April 2014 he received 5 certificates in a single international conference to set a record. Dr Victor Chang received 1 award and 4 certificates in one single international conference in May 2015 to set another record. He is the Founding Chair of international workshops in Emerging Software as a Service and Enterprise Security. His workshops have been described as the most successful workshops by conference organizers and have attracted audiences with positive response. As a result, he received an IEEE Outstanding Service Award in 2015.

One of his workshops has stepped up as an international conference on Internet of Things, Big Data and Security (IoTBDS) that has attracted high-profiled submissions and high-quality journalsqbacking. He is also the founding chair for the international conference on Complexity, Future Information Systems and Risk (COMPLEXIS). He is an editor of the Cloud Computing adoption book with IGI Global. He is a reviewer of International Journal of Information Management (IJIM), Expert Systems with Applications, IEEE Transactions on Cloud Computing, IEEE Transactions on Services Computing, Journal of Internet Services and Applications and Journal of Computing and Information Technology. Dr Victor Chang is a joint Editor-in-Chief ofInternational Journal of Organizational and Collective Intelligence (IJOCI), and Open Journal of Big Data (OJBD). He has a leading journal, Business Intelligence as a Service in the Cloud+ published in July 2014 by a highly prestigious journal, Future Generation Computer Systems (FGCS). He has been promoted as an Editor of FGCS since October 2014. He has the most popular article in a transaction world leading journal, called %Towards Achieving Data Security with the Cloud Computing Adoption Framework+. He is a guest editor for FGCS, IJIM, JNCA (J of Network and Computer Application) and ASOC (Applied Soft Computing) special issues. He welcomes submission of any high-quality papers to his journals. Some of his publications are available here.

Abstract: This keynote will focus on the recent development, challenges, and recommendations from Internet of Things (IoT) and Data Science. IoT provides the platform to connect to different devices and collect data. Data Science provides techniques and methods to process, analyze, visualize and understand data. This talk includes research contributions from different services, such as health informatics, business intelligence, weather visualization, social networks, geo-economics, and integration as a service. Results of such services have real life contributions apart from research and development. Real-life examples such as temperature distributions in France and geo-economic situations in France will be discussed and presented.

Paper Abstracts

Session 1: eSystems Engineering I

Linear Relational Model Between P-Value and Co Relation Value

In many research areas where the hypothetical based study is performed p-value is most commonly used statistical measure for null hypothesis testing. This p-value is deciding factor in considering the hypothesis validity for given population. Such a critical value can sometimes mislead the entire research. So there is always scope in understanding such factors in all possible directions. One of such is a study on the parameters which influence the p-value. In this paper one such effort is made on understanding the influence of correlation, which is very familiar statistic measure. Two of these measures can be game changer in any statistical analysis. Also p-value is misinterpreted by many researchers and this could lead to huge financial loss or sometimes lead social disaster. More we understand these crucial parameters and how they depend on each other, helps in avoiding such mistakes. This also make any researcher more confident on his work. Linear regression is one such modelling technique used for predictive analysis. This linear modelling technique is used in this paper to build a relational linear model. With such mathematical results and observations, main objective of this study is full filled by interpreting how the p-value and co relational value are related.

Neelakantagouda S Patil (Freelance Researcher and Software Engineer, India)
Megha Yaligar (VTU, India)

Applying System Science and System Thinking Techniques to BIM Management

Requirements are recognized as the NUMBER ONE cause of failed projects! Over budget, over schedule, reduced scope, poor quality, unhappy customers and cancelled projects are the results of bad requirements. The solution to bad requirements is to introduce a %Business or Mission analysis+ as it initiates the life cycle of the system of interest by defining the problem domain that are bound to the solution domain while developing the business requirements and validation criteria. The market requirements for intelligent devices (district energy management, performance analysis and simulations) for SMART Cities has pushed the construction industry into experiencing product and service developments requiring concepts similar to the system life cycle processes per ISO/IEC/IEEE 15288. The use of Building Information Modelling (BIM) in the industry has closed the gap analysis between designed applications used in architectural design and those used in fabrication. This papers disruption innovation theory requires the need to change traditional construction management techniques into System Processes. The designated BIM manager cannot use a virtual model to develop infrastructure based on 2D managing concepts. This paper will demonstrate how system science and system thinking methodology can be used to enhance the management principles of construction projects using virtual designs. The authors apply a problem analysis technique to a desktop case-study ±construction project based in UAE.qThe results of the analysis provide additional subjective thoughts targeting the problem space associated with the initial solution space domain.

Alan Martin Redmond (Numérique Consulting)
Mustafa Alshawi (University of Salford, United Kingdom (Great Britain))

1570363885

Detecting the Disc Herniation in Segmented Lumbar Spine MR Image Using Centroid Distance Function

Disc herniation is considered as the main cause for lower back pain (LBP), a health issue that affects a very high proportion of the UK population and is costing the UK government over £1.3 million per day in health care cost. Currently, the process to diagnose the cause of LBP involves a visual examination of a large number of Magnetic Resonance Images (MRI) but this process is both expensive in terms time and effort. Automatic detection of the lumbar disc herniation will reduce the time to diagnose and detect the cause of LBP by the orthopedist. There has been very limited progress towards automatic detection of disc herniation and all of the proposed techniques still require substantial manual intervention in many of the stages. Our analysis of the problem suggests that using the axial view of the MRI could potentially improve the outcome as opposed to the sagittal view used by these techniques. In this paper, we propose using the Centroid Distance Function as a shape feature of a segmented disc MRI taken from the axial view. Visual observation of the feature indicates that the feature could be used as a suitable indicator of the presence of herniation in the lumbar disc.

Ala Al Kafri, Sudirman Sudirman, Abir J Hussain, Paul Fergus, Dhiya Al-Jumeily and Mohammed Khalaf
(Liverpool John Moores University, United Kingdom (Great Britain))
Hiba Al Smadi (Liverpool John Moores University, Afghanistan)

1570355478

Wearable Devices and IoT as Enablers of Assistive Technologies

In assistive technology scenarios, this paper investigates how wearable devices may be used as smart solutions for accessing computers. We focus our attention on a smartwatch available on the consumer market; by using an open source middleware, based on low cost embedded systems, we propose to develop custom apps to process data from smartwatch's resources (e.g., sensors) and send them to a Linux single board computer. The latter component plays a critical role because it converts received data into raw input signals for a connected computer by emulating a standard mouse or a keyboard. Since the process requires no software installation on the target device, the user with a disability benefits from a single personalized equipment to control a wide range of computer devices, including traditional personal computers, tablets and smartphones. Additionally, the embedded system accesses the Internet and it takes advantage of the container-based virtualization technology to customize on demand its behaviour according to user's needs and preferences.

Davide Mulfari (University of Messina)
Antonino Longo Minnolo, Antonio Puliafito
(University of Messina, Italy)

1570372159

Adaptive Clustering Based Inclusion and Computational Intelligence for a Fed-Batch Fermentation Process Control

In this paper various techniques from Computational Intelligence (CI) have been considered for real-time state estimation and prediction of biomass concentrations. The main focus is a fuzzy clustering based on inclusion concept which simplifies the CI generated rule-base before real-time implementation of the constructed computational engine. As a software sensor, the constructed computational engine 'infer' the production of biomass from variables easily measured on-line. The construction and the application of each CI paradigm including a genetically optimized fuzzy logic system is presented and the performance of fuzzy clustering based on inclusion concept is addressed by considering integral-square-error (ISE) as the ultimate design requirement.

M Soufian (Edinburgh Napier University, United Kingdom (Great Britain))
Samia Nefti (University of Salford, United Kingdom (Great Britain))

Session 2: Special Session

Machine learning and neuroscience applied to real world learning and self-development

1570334401

Uncovering Terrorist Attacks Using Machine Learning Approaches

Terrorism is an important and challenging concern. The entire world is threatened by only few sophisticated terrorist groups and especially in Gulf Region and Pakistan, it has become extremely destructive phenomena in recent years. Predicting the pattern of attack type, attack group and target type is an intricate task. This study offers new insight on terrorist group's attack type and its chosen target. This research paper proposes a framework for prediction of terrorist attacks using the historical data and making an association between terrorist group, their attack type and target. Analysis shows that the number of attacks per year will keep on increasing, and Al-Harmayan in Saudi Arabia, Al-Qaida in Gulf Region and Tehreek-e-Taliban in Pakistan will remain responsible for many future terrorist attacks. Top main targets of each group will be private citizen and property, police, government and military sector under constant circumstances.

Mustansar Ghazanfar (University of Southampton, United Kingdom (Great Britain))

1570356543

A Fatigue Prediction Cognitive Model for Naturalistic Typing Environment

Workplace safety has been gaining a growing attention in industry and insurance companies. Mental fatigue represents the main factor of work-safety degradation and can therefore lead to fatal errors and catastrophic accidents. This paper presents a fatigue prediction model for naturalistic typing environment, which is based on an existing adaptive control of though-rational (ACT-R) frame. The naturalistic keyboard typing that is one of the daily tasks required in many work environments is used in this study to instantiate a new model in the ACT-R through capturing changes in fatigue- related parameters. Validity of the developed model is assessed experimentally through comparing the generated results with existing experimental findings. The correlation between the experimental and simulated results shows a partial agreement between the instantiated ACT-R model and the actual human behavior.

Hilal Al-Libawy, Ali Al-Ataby, Waleed Al-Nuaimy and Majid A. Al-Taee
(University of Liverpool, United Kingdom (Great Britain))
Ahmad Al-Taee (Saint Louis University, USA)

1570369777

Visual Editor of Scenarios for Virtual Laboratories

The paper presents the implementation of a visual node-based script (scenario) editor that allows to design a series of experiments for virtual education laboratories. Having compared our approach with analogs, we identified a number of advantages that were described. It is shown that the concept of visual programming is important for organizing the good methodical work on education. The connection between the proposed approach and opportunity to increase and measure students involvement is described.

Vlada Kugurakova (Kazan Federal University, Russia)

1570356594

Recurrent Neural Network Architectures for Analysing Biomedical Data sets

This paper presents the utilisation of dynamical recurrent neural network architectures in the purpose of classifying the Sickle Cell disorder data. It is indicted that recurrent neural networks such as the Jordan network produce a great improvement with clinical data sets and have helped in acquiring high accuracy. The main aim of this study is to provide a sophisticated model to differentiate applications of dynamical neural networks for medically related problems. We attempt to classify the amount of medications for each patient with Sickle Cell disorder. We use different recurrent neural network architectures in terms of examining performance for each model within this study. The motivation for the classification approach used in this study is to support medical sectors to offer proper therapy advice depending on the former data set. The outcomes yield from different classifiers during our experiments indicated that Elman and hybrid recurrent neural networks produced inferior results when compared to Jordan neural networks. Results have indicated that for the recurrent network models tested, the Jordan architecture was found to yield considerably better results over the range of performance measures that been selected for this research.

Mohammed Khalaf, Abir Hussain, Robert Keight, Dhiya Al-Jumeily,
Ibrahim Idowu, Paul Fergus, Ala Al Kafri, Carl Chalmers
(Liverpool John Moores University, United Kingdom (Great Britain))
Russell Keenan (Alder Hey Children's Hospital, United Kingdom (Great Britain))
Dhafar Hamed Abd (Al-Maaref University College, Iraq)
Wafaa Salih (University of Technology, Iraq)

1570364881

Towards A Hybrid Approach of Self-Organizing Map and Density-Based Spatial Clustering of Applications with Noise for Image Segmentation

Image segmentation is the process to divide a digital image into a number of regions for further usage. Color images can be segmented by applying density-based clustering methods, e.g. Density-Based Spatial Clustering of Applications with Noise (DBSCAN), which is used to identify the arbitrary shaped clusters. The drawback of DBSCAN is the high computational complexity whilst the size of image input is normally very large. Self-Organizing Map (SOM) is a dimensionality reduction method which can be applied to reduce the dimensions of image processing tasks. This paper proposes a hybrid method of SOM and DBSCAN (SOM-DBSCAN) for image segmentation. To evaluating the usability of the proposed SOM-DBSCAN method, four images are used to benchmark image segmentation.

Qi Chen, Kevin Kam Fung Yuen (Xi'an Jiaotong-Liverpool University, P.R. China)
Chun Guan (University of Liverpool, United Kingdom (Great Britain))

Session 3: e-Security and e-Forensics

Towards a Framework for the Extension and Visualisation of Cyber Security Requirements in Modelling Languages

Every so often papers are published presenting a new extension for modelling cyber security requirements in Business Process Model and Notation (BPMN). The frequent production of new extensions by experts belies the need for a richer and more usable representation of security requirements in BPMN processes. In this paper, we present our work considering an analysis of existing extensions and identify the notational issues present within each of them. We discuss how there is yet no single extension which represents a comprehensive range of cyber security concepts. Consequently, there is no adequate solution for accurately specifying cyber security requirements within BPMN. In order to address this, we propose a new framework that can be used to extend, visualise and verify cyber security requirements in not only BPMN, but any other existing modelling language. The framework comprises of the three core roles necessary for the successful development of a security extension. With each of these being further subdivided into the respective components each role must complete.

Curtis Maines, Bo Zhou, Stephen Tang and Qi Shi
(Liverpool John Moores University, United Kingdom (Great Britain))

A New Approach to Securing Speech Signals

This paper proposes a new approach to the encryption of speech intended to be transferred on an insecure channel. The proposed technique is based on stream encryption where the original recorded speech signal is, first, processed to select the relevant data for encryption. In addition to reducing the size of the speech signal, the selection process also reduces the encryption and decryption times. The selected data is encrypted using a pseudo-random generator to make the information unable to understand by an intruder. The used pseudo-random generator is based on two 256-bits shift registers, one is linear and the other non-linear. This generator allows encryption in higher dimensional space which expands the key space and, therefore, improves security against brute force attack. Security analysis has been performed. The analysis shows that the proposed scheme is computationally simple, efficient with superior performance compared to other systems presented in the literature.

Belmeguenai Aissa, Zahir Ahmida, Rafik Djemili
(Université 20 Août 1955, Algeria)

Selecting Scalable Network Features for Infiltration Detection

The objective of this study is to explore feature selection for the detection of internal intruders within a local network during the early stages of an attack. As the sophistication of attackers increase, current security systems have proven incapable of detecting advanced stealthy attackers whose aim is to compromise internal networks and remain undetected. We study the available features that are commonly used during network-layer attacker detection and propose two new features to model the extent to which a given networked endpoint conforms with network traffic norms. The proposed features are analysed using several attribute evaluation methods to compare the predictiveness of commonly used features. The results of the analysis show that the proposed features are highly predictive and work towards overcoming the identified deployability issues of previous systems.

Phillip Kendrick, Abir J Hussain, Martin Randles
(Liverpool John Moores University, United Kingdom (Great Britain))
Natalia Criado (Kings College London, United Kingdom (Great Britain))

1570356098

Hybrid Classification Approach Using Self-Organizing Map and Back Propagation Artificial Neural Networks for Intrusion Detection

The study is intended to enhance the accuracy of intrusion detection systems by combining supervised and unsupervised machine learning techniques. In this work a combination of hybrid approach is implemented, in which a supervised and unsupervised machine learning techniques are used. The unsupervised Self-Organization Map (SOM) is used to identify normal/up-normal activities. In this case a Back Propagation Neural Network (BPNN) is used for the classification of attack traffic into various types. This approach resulted in a NSL_KDD dataset of various normal/up-normal records, represented by 41 features. The obtained results show that the proposed approach has improved the performance and accuracy of the intrusion detection system. From the results it can be seen that the implemented approach achieved up to 98% detection rate, compared to previous methods that at best achieved 96% detection rate. From the study and the result obtained it can be concluded that the combination of multi-tire classification approach has improved the detection rate of the IDS. The choice of combining SOM and BPNN has proven to be an efficient approach. It is intended to extend this work by implementing different combination strategies that involve methods that would results in further detection rate enhancement.

Sadeq AlHamouz (The World Islamic Sciences and Education University, France)
Ahmad Adel Abu-Shareha (Middle East University, Jordan)

1570356238

A Robust Spatially Invariant Model for Latent Fingerprint Authentication Approach

Biometric fingerprints are one of the most broadly used form of biometric identification. Everyone is known to have unique, immutable fingerprints. In this area, the most challenging task is fingerprint recognition and identification system. This filed of the biometric data is significantly depends on the major quality data (input and tested images). A latent intelligent model is proposed in this paper. Our approach relies on develop an alternative approach to solve the localization problem based on Swarm Intelligence (SI) methodology for a robustness rotational and spatially invariant fingerprint recognition and verification model. In our latent model, a group of partial local features is extracted from fingerprint based on swarm-intelligence methodology such as Particle Swarm Optimization Algorithm (PSO) as a first one, and Firefly Optimized Algorithm (FOA) Algorithms as a second algorithm. The search strategy in swarmintelligence methodology is an iteratively process which is guided by a fitness function that is been defined to maximize the class distribution separation. This methodology allows the latent model to detect and extract new features instead of using the typical model (Minutiae based feature extraction). Two main contributions have assumed in this paper to achieve the efficacity and solve the spatially invariant of the fingerprint recognition problems. The first contribution of this paper is proposing a new formulation method for finding a new feature selection approach fashion, which is based on Discrete Wavelet Transform. This formulation feature selection solves the locality problem of the fingerprint feature selection by applying swarms separately to four sub-bands fingerprint image, that to diversify the feature selection, and to improve the recognition/identification rate in additional to speed up the feat an invariant moment matching algorithm to address the potentially misclassified features to improve the matching accuracy, and to solve the miss-sequentially features tracking for the swarm-intelligent approach. The proposed approach (PSO) and (FOA) are found to generate significant improvement for recognition results by admitted about 99.1-100% accuracy. The proposed system has been applied on large scale dataset. However, it admits accuracy that ranged (96.35-99.00%), when it has been applied for fingerprints with a significant rotation issues of 0º-360º.

Dhiya Al-Jumeily (Liverpool John Moores University, United Kingdom (Great Britain))
Adil Al-Azzawi (University of Missouri-Columbia, USA)
Asmaa Mahdi (City, University of London, United Kingdom (Great Britain))

1570356500

Enforcing Access Control Models in System Applications by using Aspect-Oriented Programming: A Literature Review

Although software developers look to the security concept as a non-functional side of application systems deny that this side represents one of the main pillars used to support the functional side of the applications, thus, increasing the recommendations of the application systems after achievement of user satisfaction. Unauthorized access to information represents one of the most important challenges faced by application systems developers. The privacy-preserving and security concepts have arisen from the usage of data resources, which sometimes leads to the sharing of personal identifying information (PII). Access control is one widely accepted security solution, by restricting the accessing of the data only to authorized users. Adding or updating access control concerns in system applications represents a difficult task for system developers because they need to track all program codes to detect where restriction methods should be inserted. At the same time, they have to define which piece of code needs to be applied for different access control policies. All of these concerns are accumulated in the problem of scattering and tangling of system software. A widely suggested but under-used solution to these problems is that of Aspect Oriented Programming (AOP). AOP is an effective technique for modularizing concerns and changing the execution behavior of existing codes with only the minimal need to change existing software implementations. In this paper we present a literature review in access control methods which used AOP to apply security concepts into application systems. Through our narration of the methods, we show the advantage of using AOP to modularize the access control policies and security concerns, and therefore increase the clarity, maintainability and reusability of system software.

Akeel Thulnoon, Kashif Kifayat
(Liverpool John Moores University, United Kingdom (Great Britain))

Session 4: e-Learning I (Technology Enhanced Learning)

1570356179

An Adapted Community of Inquiry (COI) Framework with the Inclusion of Instructor Presence

This study reports the results of an experiment conducted based on a survey used in Community of Inquiry (COI) framework - to find the students perception towards the instructor presence in blended learning. This framework is fully utilised by using all the elements to evaluate the presence of the instructor that can affect the studentsq perceptions. Then, the analysis is continued by finding the categories that can demonstrate the sense of presence of the instructor in blended learning. SecondLife, a virtual world platform has been used to as the platform of evaluation due to the immersive environment it provided. The results indicate that the instructor presence is important in making the learning experience a valuable one to students.

Nani Amalina Zulkanain, Elin Eliana Abdul Rahim
(Universiti Teknologi MARA, Malaysia)

1570356180

A Guideline for the Development of Blended Learning Platform Based on the Observation of Students' Reaction in a Virtual World

This research focuses on the importance of the instructor in a virtual learning environment for the purpose of blended learning. To assess the instructorq involvement, the Community of Inquiry (COI) framework was used. The students were observed throughout the experiments. The results were gathered and analysed. The findings produce a beneficial guideline to conduct a learning session in the virtual world that could be used by other developers who wish to develop similar platform.

Nani Amalina Zulkanain, Elin Eliana Abdul Rahim
(Universiti Teknologi MARA, Malaysia)

1570355593

Overview on Modern Serious Games for Regional and Minority Languages Promotion

The article presents the analysis of gamification software for the minority languages promotion. Gamification is a concept of using videogame aspects that invoke pupilq motivation and interest in the educational software. The aim of the paper is to provide an overview on the current situation with the modern software that can be used to teach regional or minority languages. Gamification software can be considered as a pioneering means ad hoc. The results of this analysis provide information that will allow to conclude, whether development of new type of gamification software for regional and minority languages promotion is necessary.

Egor Petrov, Jamila Mustafina (Kazan Federal University, Russia)

1570355629

Distance Learning of Regional Languages: Comparative Analysis:
(Case Study: Tatarstan, Bashkortostan, Chuvashia, Udmurtia - Russian National Regions)

The article provides a comparative analysis of the resources of distance learning of regional languages. It presents the overview of online learning websites for the Tatar, Bashkir, Udmurt and Chuvash languages . regional co-official languages of the Russian Federation. The main factors determining the level of representation of a particular language in the field of Internet technologies are identified. Results of the analysis allow to improve the set of measures within the regional language policy to improve the functionality of Russian regional languages.

Nailya Nurutdinova; Jamila Mustafina (Kazan Federal University, Russia)
Lilia Mustafina (Naberezhnye Chelny Institute Kazan Federal University, Russia)

1570356476

Towards a multidimensional model to study a critical success factors affecting continuity and success in e-learning systems

E-learning constitutes an alternative to face to face traditional educational system. Unfortunately, many learners stop their online learning at its beginning. This paper aims system at exploring and identifying the critical success factors (CSFs) to predict learnersq satisfaction, continuance and success in on line platform learning. We also proposed a hybrid model that classify success factors of online learning in four dimensions include the learner characteristics, the instructor characteristics, the system specificities and the social influence.

Yassine Safsouf
(University Bretage Sud, Vannes, France & University Hassan II de Casablanca, Morocco)
Khalifa Mansouri (Hassan II University of Casablanca, Morocco)
Franck Poirier (Lab-STICC, University Bretage Sud, France)

Session 5: Special Session
Advanced Robotics

1570356138

Spiking Reasoning System

In this position paper the newel approach for the spiking reasoning system for the real-time processing of a robotic system represented. This is the development of the %Robot dream+ architecture presented earlier, specifically the real-time robotic management system. The main idea of the architecture is inherited from our previous works on machine cognition that have their roots in works of Marvin Minsky, specifically %model of six+ as six levels of the mental activity. The principal approach for the high-level architecture and provide examples of the data structures of the spiking reasoning system and robotic system management architecture was demonstrated.

Alexander Toschev, Max Talanov
(Kazan Federal University, Russia)
Vitaliy Kurnosov (Kazan National Research Technological University)

1570365799

Tool for 3D Gazebo map construction from Arbitrary Images and Laser Scans

Algorithms for mobile robots, such as navigation, mapping, and SLAM, require proper modelling of environment. Our paper presents an automatic tool that allows creating a realistic 3D-landscape in Gazebo simulation, which is based on the real sensor-based experimental results. The tool provides an occupancy grid map automatic filtering and import to Gazebo framework as a heightmap and enables to configure the settings for created simulation environment. In addition, the tool is capable to create a 3D Gazebo map from any arbitrary image.

Roman Lavrenov
(Kazan Federal University & Higher School of Information Technology and Information Systems, Russia)
Aufar Zakiev (Kazan Federal University, Russia)

1570365805

Towards DJI Phantom 4 Realistic Simulation with Gimbal and RC Controller in ROS/Gazebo Environment

Quadrotor UAVs like DJI Phantom 4 have been successfully used in research and commercial applications in recent years. Although there has been significant progress in the design of control algorithms, testing of UAVs involve risk of damage to the expensive aircraft. To manage this issue, systems for the simulation of quadrotor UAVs are available in Gazebo simulator. However existing simulations are simplified and doesn't represent commercially available UAVs completely. As a main option to achieve stability of video feed is the use of a gimbal we improve existing simulation package with DJI Phantom specific gimbal. We also added RC transmitter to provide realistic control to simulated UAV.

Artur Sagitov, Yuri Gerasimov
(Kazan Federal University, Russia)

1570366189

Towards Effective Interactive Teaching and Learning Strategies in Robotics Education

Robotics education is one of the most emerged and demanding fields of modern engineering education. To prepare skilled specialists for industrial needs it is important to create high-quality educational base. Intelligent Robotics Department takes its first steps in developing and implementing a new robotics educational program. This paper reviews Russian robotics education and describes our current work toward program establishing. To evaluate student motivation of connecting their education and further career with robotics we ran a survey among bachelor and master students, which have selected robotics subjects as elective courses. We present results and analysis of the survey, and elaborate on next steps of program development.

Tatyana Tsoy, Leysan Sabirova, Evgeni Magid
(Kazan Federal University, Russia)

1570366199

Comparing Fiducial Marker Systems Occlusion Resilience Through a Robot Eye

A fiducial marker is a system of unique planar markers that are placed in an environment and should be automatically detected with a camera through marker-specific detection procedures. Their application varies greatly, while the most popular are industrial systems, augmented reality, and robot navigation. All these applications imply that a marker system must be robust to such factors as view angles, types of occlusions, distance and light condition variations etc. Our paper compares existing ARTag, AprilTag, and CALTag systems utilizing a high fidelity camera, which is a main vision sensor of a full-size Russian humanoid robot AR-601M. Our experimental comparison verified the three marker systems reliability and detection rate in occlusions of various types and intensities and a preferable for AR-601M robot applications marker system was selected.

Ksenia Shabalina, Evgeni Magid, Artur Sagitov
(Kazan Federal University, Russia)
Hongbing Li (Shanghai Jiao Tong University, P.R. China)

1570372163

Genetic Sensor Placement in Active Control of a Robotic Arm

This paper emphasizes the characterization of the dynamic motions of a robotic arm in terms of poles and zeros. The importance of the transmission zeros of open-loop systems, the role of these zeros in description of such systems, and the dependence of the transmission zeros on the actuators and sensor locations are addressed. The uses of Genetic Algorithms (GAs) for the optimal placement of the collocated actuators and sensors of such plants are presented. It is also demonstrated that GAs provides a synthesis technique that is both direct and uncomplicated for the design of active controllers for relatively flexible structures such as robotic arms. The genetic design of such active controllers is illustrated by regarding integral square-error (ISE) as the ultimate design requirement. The effectiveness of this methodology is illustrated by application to a simple cantilever beam example.

M Soufian (Edinburgh Napier University, United Kingdom (Great Britain))

Session 6: Special Session
Internet of Everythings (IoE)

1570339090

Smart Orientation for Blind People in e-City

Audio feedback Bluetooth-based beacon system for blind people orientation in the city is presented. The system consists of three main components: Bluetooth beacons that are placed on the city objects, mobile application, and website. Current implementation of the system in the underground walkthrough is presented. Future development of the proposed system and possible use cases are discussed in this paper.

Ivan Seleznov
(National Technical University of Ukraine & Children Science Studios, Ukraine);
Andrii Konovalenko (National Technical University of Ukraine, Ukraine)

1570356542

Monitoring the Performance of Solar Street Lights in Sahelian Environment: Case Study of Senegal

This paper presents an innovation in the maintenance of solar street lights in Senegal. On the one hand, there are currently 71000 solar street lights in Senegal and this number will continually increase thanks to the financing of the West African Economic and Monetary Union (also known by its French acronym, UEMOA). On the other hand, Senegal is situated in the Western part of Africa within the Sahelian region which is under dust influence all year long. According to recent studies the degradation of the power of the crystalline silicon photovoltaic modules due to the dust deposits is up to 68% in Senegal. In this context we propose a connected system for monitoring the performance of the solar street lights in Senegal. This paper presents the implemented solar street light at the fitness trail of the western corniche of Dakar which is selected as a pilot zone. The proposed solar street light is equipped with sensors and a transmission system for collecting the data in real time on a remote server. A Web server is deployed and the collected data can be viewed for monitoring purposes by designed users as the municipality staff which is responsible for the maintenance of the solar street lights. The use of these data allows better planning of the cleaning of the street light solar panel. The works presented in this paper are very useful and can be used throughout the sub-region.

Moussa Diallo (UCAD, Senegal)
Abdoulaye Kama (UCAD/ESP, Senegal)
Mamadou Drame (UCAD/FST, Senegal)
Mamadou Lamine Ndiaye (Universite Cheikh Anta DIOP, Senegal)
Ababacar Ndiaye (UASZ, Senegal)
Papa Alioune Ndiaye (ESP/UCAD, Senegal)

1570357691

Mobile Cloud Computing: Challenges and Future Research Directions

In society today, mobile communication and mobile computing have a significant role in every aspect of our lives, both personal and public communication. However, the growth in mobile computing usage can be enhanced by integrating mobile computing into cloud computing. This will result in emerging a new model called Mobile Cloud Computing (MCC) that has recently attracted much attention in academic sector. In this work, the main challenges and issues related to MCC are outlined. We also present the recent work and countermeasure solutions that are proposed by researchers to counter the challenges and lastly, crucial open research and issues that direct future research are highlighted.

Samaher Al-Janabi (Babylon University, Iraq)

Session 7: e-Networking and Wireless Environments

1570355396

Supervised Machine Learning Techniques for Social Aware Cognitive Radio Handovers

Communication technology on the whole has seen unprecedented heights on its entry into the twenty-first century and specifically the wireless communication has grown to unparallel dimensions in the areas of wireless data links, mobile networks and also in the field of wireless technologies; and this demand places a significant burden on the scarce wireless spectrum. A novel dynamic spectrum sharing method has been proposed to deal with this spectrum under-utilization problem and maintain the growing wireless traffic claim to share the spectrum with licensed primary users. Social language is an efficient method for communicating and coordinating information among cognitive radios which is a technique inspired by natural communities. The Social Cognitive Radio Network (SCRN) combines technique of social data network and communication among mobile networks. The SCRN can be measured as an application system which provides a range of data delivery services concerning the social relationship among mobile users. This research focuses on the usage and availability of a broad range of SCRN which caters to the needs and perspectives of a variety of applications, cognitive network architecture and handover issue. A bio-intelligent algorithm called social cognitive handover (SCH) is derived based on a supervised machine intelligence algorithm called Particle Swarm Optimization (PSO) in-order to: a) Evaluate efficient spectrum utilization and b) Increased data transfer at an average SNR for any social application like Facebook, Linkedin, etc.,. Experimental results taken by analyzing the frequency rate of various IEEE802.x protocols show that proposed SCH-SpecPSO outperforms nearly 75% more compared to traditional methods, by optimizing various handoff issues.

Anandakumar H (Akshaya College of Engineering and Technology & Anna University, India)

1570346713

Effect of GSM Frequency Band on Received Signal Strength and Distance Estimation from Cell Tower

This work intends to analyse the relationship of a particular GSM frequency band with the received signal strength (RSS) on a receiving mobile device. This work has shown that there is a significant relationship between frequency and RSS values. Thus no one particular algorithm can be used to co-relate signal strength to distance without factoring in the frequency band. The signal and attenuation channel has been simulated for the various frequency bands and distances. This work is based on the assumption that the propagated signal is on a static frequency and that advanced fading inhibition techniques like frequency hopping are not in use. A path-loss model has been implemented on the different downlink frequency and the respective received RSS values against distance plotted.

Robson T Reza (University of KwaZulu-Natal, South Africa);
Viranjay Mohan Srivastava
(University of KwaZulu-Natal Private BagX54001 Durban & South Africa, South Africa)

1570344038

Polarization Insensitive 3D Cylindrical Shaped Frequency Selective Surface

A novel structure of three dimensional Cylindrical Shaped Frequency Selective Surface (CSFSS) has been structured and its polarization sensitivity has been analyzed. The effect of oblique angle of incident electromagnetic wave on the CSFSS by varying the circumference of the outer ring has been observed. The analysis has been made for oblique incident angles from 0o to 60o. The resultant frequency response reveals that the CSFSS structure has been found highly polarization insensitive and obtained a stable transmission response with respect to incident EM wave. Moreover, an analysis has been made to find out the effect of variation of the circumference on the resonant frequency and result shows a highly sensitive and interesting relation between them.

Dhawan Singh (Howard College, South Africa)
Viranjay Mohan Srivastava
(University of KwaZulu-Natal Private BagX54001 Durban & South Africa, South Africa)

1570356350

In-body Routing Protocols for Wireless Body Sensor Networks

Recent advances in wireless communication have led to the introduction of a novel network of miniaturized, low power, intelligent sensors that can be placed in, on, or around the body. This network is referred to as Wireless Body Area Network (WBAN). The main purpose of WBAN is to physiologically monitor patients vital signs and consequently route the related data towards a base station. Since the environment of such a network is principally the human body, data routing mechanisms used in traditional wireless networks (e.g. WSN, WANET) need to be revised, and more restrictions have to be addressed in order to adapt it to WBAN routing challenges. Compared to those dedicated to on-body WBAN, in-body WBAN routing protocols have more constrains and restrictions and are expected to be efficient and robust. As better as we know, only few routing protocols have been proposed in literature and the research field stills underexplored. Therefore, in this paper we present an overview of the main existing routing protocols proposed for wireless in-body sensor networks (WIBSN).

Romaissa Bendjehich (Lastic Laboratory, University of Batna 2, Algeria)
Djallel-Eddine Boubiche (University of Batna 2 & LaSTIC Laboratoty, Algeria)

Session 8: e-Health and e-Medicine

Privacy Preservation for eSports:

A Case Study Towards Augmented Video Golf Coaching System (Virtual)

This paper presents a solution for filtering personally identifiable information for developments of augmented video coaching systems and exergames applied on a golf case study. Aligned with eWaste reduction, this study included multiple low-cost video sources including new and obsolete video cameras, mobile devices, and Microsoft Kinect to capture and convert motion data as a silhouette-based video. The algorithm development combined computer vision techniques with design science. The silhouette-based video produced was sufficient for a coach to provide analysis of static and dynamic critical features of golf swings (e.g. stance, tempo and swing plane). In looking beyond eSport systems, the achieved outcomes (robustness to colours, contrast, diverse video resolutions and lightning intensity changes) and insights are universally applicable to enable human- or AI- based motion activity analytics. The next-generation of IoE/IoT and ubiquitous systems will benefit from presented algorithms integrated in smart homes, post-surgery/rehabilitation environments, elderly activity/safety monitoring, sport umpiring and other motion analysis contexts and environments where video privacy is considered paramount.

Boris Ba i , Qi Meng, Kam Yuk Chan
(Auckland University of Technology, New Zealand)

MRI Breast Cancer Automatic Segmentation Using Watershed Algorithm

Carrying out a precise, rapid and reproducible delineation of breast lesions can be difficult, as the lesions may have complex topological structures and heterogeneous intensity distributions. The early detection of malignant breast tumors can be facilitated by the magnetic resonance imaging (MRI) combined with an appropriate automatic segmentation algorithm, which may prove to be a better imaging technique. The main objective of this study is to develop a mechanism for the automatic segmentation and early detection of breast cancer basing on the application of the watershed transform to MRI images. The algorithm was divided into three major segments: pre-processing, watershed and post-processing. The different segments are computed, and the final image was cleared of all noise. The final modified image is generated after the final image is superimposed on the original MRI image. This algorithm successfully resulted in the automatic segmentation of the MRI images, and proved to be a beneficial tool for the early detection of breast cancer. This study showed that the automatic results were in conformance with the manual detection and highly accurate.

Hanan Alshanbari (Coventry University, Afghanistan)

1570364512

Aggregating Heterogeneous Health Data Through an Ontological Common Health Language

Interoperability between healthcare information systems is a challenge for the identification of important health-related events (through correlation of information across systems) and as a result for improving the patient care quality. Most of these systems are far from being interoperable and operate independently, whilst the value emerging from their exploitation is limited. While several techniques to address this challenge are based on medical standards and technologies, these techniques are not applicable to different scenarios, thus a holistic solution is needed. This paper focuses on the semantic interoperability of multiple electronic health recordsq(EHRs) . and their standards, proposing a multi-step generic semantic architecture that can be implemented simultaneously to different medical standards, for efficiently managing heterogeneous EHRsqdata. The proposed architecture combines a mechanism for extracting Domain Specific information from classified EHRsq datasets, transforming them into a Common Health Language (CHL) through Ontologies, whereas unknown datasets are mapped and translated into CHL, using Ontology-Mapping techniques.

Athanasios Kiourtis, Argyro Mavrogiorgou, Dimosthenis Kyriazis
(University of Piraeus, Greece)

1570355883

A Novel Choroid Segmentation Method for Retinal Diagnosis Using Deep Learning

Reliable choroid measurements have become an important diagnostic modality for sight-threatening retinal diseases. However, automatic and accurate segmentation of the choroid remains an unresolved challenge. This paper proposes a novel choroid segmentation method, based on a deep learning algorithm that is capable of quick and accurate image segmentation without user intervention. This is achieved through combining pixel clustering, image enhancement and deep learning. The simple linear iterative clustering (SLIC) algorithm has been applied to extract the super pixels (patches). Next, the extracted patches are then enhanced through increasing contrast of the region of interest. After that, the patches are fed to convolutional neural network for labelling the regions into choroid or non-choroid. Performance of the developed algorithm is assessed using a dataset of 169 enhanced depth imaging optical coherence tomography images. The obtained results demonstrated effectiveness of the proposed segmentation method in terms of accuracy (98.01%).

Baidaa Al-Bander, Bryan Williams, Majid A. Al-Taee, Waleed Al-Nuaimy, Yalin Zheng
(University of Liverpool, United Kingdom (Great Britain))

1570356071

Computer Stereovision System for 3D Tracking of Free-Swimming Zebrafish

Zebrafish (Danio rerio) has been gaining an enormous attention, as a promising model organism, in studies relevant to human diseases, drug tests, and other studies. However, behavior studies of this kind of fish, using computer vision, is still challenging due to its small size, and fast and unpredictable movement. This paper proposes a new stereovision system for 3D tracking of free-swimming zebrafish. The proposed system that comprises two fixed cameras takes two images separated by a baseline. Centroids of the target to be tracked at both images are identified and used to extract the third coordinate of the 3D model using simple triangulation to derive the targets depth. The validity of the derived stereo model is assessed experimentally and compared to an existing orthogonal model. The performance of the developed stereovision system is assessed experimentally using adult zebrafish. The obtained results demonstrated high-performance correlation (82%) between the developed system and an existing orthogonal vision system in terms of depth estimation and overall 3D trajectory tracking. However, the stereovision system offers a significant a significant reduction in the complexity of system setup and requirement of the experimental space as compared to that of the orthogonal system.

Qussay Al-Jubouri, Waleed Al-Nuaimy, Majid A. Al-Taee, Iain Young
(University of Liverpool, United Kingdom (Great Britain))

Session 9: e-Government systems, Autonomic Computing and AI

1570355451

A Study on Road Accidents in Abu Dhabi

Implementing a Vehicle Telematics System to Reduce Cost, Risk and Improve Safety

Road accident study in the Emirate of Abu Dhabi is imperative as it will allow the government to improve its transport system and realize the vision of Abu Dhabi Department of Transport to contribute to quality of life, economic growth and environmental sustainability of the Emirate of Abu Dhabi. Despite sustainable and continuous reduction annually, road accidents still remain a serious phenomenon in the Emirate of Abu Dhabi. Road accidents killed 5,564 people in the UAE over the past 6 years, an average of more than two each day, with Abu Dhabi being the main victim [8]. A further examination of the severity index, Police records have shown that the deaths during the years 2006-2011 were a result of nearly 56,700 accidents, which also injured 63,406 people [8]. Research has shown that over 80% of road accidents are related to human factors [6]. Bad driving habits are dangerous and can lead to loss of life. This study will propose possible method of adopting Telematics System for Abu Dhabi Department of Transport to enhance its road safety programs. Telematics System can help reduce fatalities and injuries, thus improving road safety and efficiency of driving performance. These services range from monitoring driversqdriving habits and reporting on driving errors, to offering analysis of any unfortunate incidents that may have occurred.

Omar Kassem Khalil (Khawarizmi International College, United Arab Emirates (UAE))

1570352057

Development of An Interactive System to Enhance Strategic Planning Process and Quality of Aviation Operations Using Balanced Scorecard:
A UAE case study

Nowadays, the internet is considered as one of the key building blocks of modern communities and a primary function to every aspect of our daily life activities. The internet is widespread and progress in the realm of the information and communication technologies demonstrated great improvements that can be utilized by government entities that strive towards achieving sustainable excellence and utmost performance. In the meantime, government organizations should maintain the delivery of high quality of services and continuously monitor and measure their performance based on appropriate approaches namely, organizing the map of corporate strategy, set of organizational strategic objectives and formulating key performance indicators. The quality levels of organizations operations can be witnessed and improved by identifying an effective planning procedure which indicate areas of enhancements and effective process for decision making to respond to dynamical changes. This paper aims to develop an interactive system to enhance strategic planning processes and quality of aviation operations using balanced scorecard. The proposed system will be integrated with the balanced scorecard approach and shall be evaluated for its effectiveness and usefulness in the aviation operations.

Mohamed Alloghani, Abir J Hussain, Dhiya Al-Jumeily and Ahmed Kaky
(Liverpool John Moores University, United Kingdom (Great Britain))
Nasser AL Shamsi (Ministry of Interior, United Arab Emirates (UAE))

1570356158

Identifying Actionable Information from Social Media for Better Government-Public Relationship

Recent years have witnessed a sudden growth of online social media (OSM). Among the various OSM sites, Twitter, an online micro-blogging website has attracted interest of millions of users who use it to access, publish and spread (share) news at a quick pace much faster than conventional news mediums. Latching on this trend, governments across the world have started using Twitter to communicate, engage with their citizens and increase their visibility and popularity. Social media makes it simpler and convenient for citizens to voice their opinions and reach out to a large section of people, and also for the government to listen to their grievances and concerns. While the data on Twitter is quite informative, it presents a challenge for analysis because it is disorganized and highly voluminous with high velocity. Every day, government accounts receive thousands of messages from the general public in the form of opinions, concerns, and grievances. It becomes an extremely troublesome task for the concerned ministries in the government, to manually filter out the irrelevant messages and respond to the genuine ones. In this paper, we attempt to address this problem by using learning algorithms to automatically classify the user generated messages as either actionable (those which can be acted upon by the government ministries) or non-actionable. We have considered eight supervised learning algorithms to classify the messages into actionable or non-actionable and compared their outcomes to determine the most effective learning algorithm. Our results indicate that random forest classifier gave the best results with an aggregate accuracy of more than 0.94 and an F-score of 0.94.

Himani Garg, Charu Bansal, Rishabh Kaushal, Indra Thannaya
(Indira Gandhi Delhi Technical Unversity Delhi, India)

1570370971

BROGO: A New Low Energy Consumption Algorithm for Leader Election in WSNs

The Leader Election in Wireless Sensor Networks depends on the nature of the application domain, the use case and the energy consumption. In the case of real time applications, the choice will be based on the speed of the election, and in the case where time is not important; the choice will be based on the energy consumption. The classical algorithm allowing toelect such a node is called the Minimum Finding Algorithm. In this algorithm, each node sends its value in a broadcast mode each time a better value is received. This process is very energy consuming and not reliable since it is subject to an important number of collisions and lost messages. In this paper, we propose a new algorithm called BROGO (Branch Optima to Global Optimum) where after finding a spanning tree of a WSN, each leaf will route a message through its branch to the root in order to find the leader in that branch. The root will then elect the global leader from the received branch leaders. This process is more reliable since there is a small number of broadcast messages and a reduced number of nodes that send broadcast messages at the same time. The obtained results show that the proposed algorithm reduces the energy consumption with rates that can exceed 95% when compared with the classical Minimum Finding Algorithm. Its message and time complexity is equal to O(n).

Farid Lalem
Madani Bezoui (University of Boumerdes, Algeria)
Nabil Kadjouh (University of Bejaia, Algeria)
Ahcene Bounceur, Reinhardt Euler (Lab-STICC, UBO, France)

1570356354

A New Mapping Approach Between XML Schemas in a P2P Environment

Algorithms for mobile robots, such as navigation, mapping, and SLAM, require proper modelling of environment. Our paper presents an automatic tool that allows creating a realistic 3D-landscape in Gazebo simulation, which is based on the real sensor-based experimental results. The tool provides an occupancy grid map automatic filtering and import to Gazebo framework as a heightmap and enables to configure the settings for created simulation environment. In addition, the tool is capable to create a 3D Gazebo map from any arbitrary image.

El yahyaoui El idrissi Selma (ENSIAS, Morocco)

Session 10: e-Learning II (Technology Enhanced Learning)

1570337468

The Attitude towards the Use of Mobile Learning Technology Enhanced Teaching

In assistive technology scenarios, this paper investigates how wearable devices may be used as the research reported in this paper examines the use of mobile learning technologies for supporting primary school teaching. Data was collected by questionnaires through an online survey in urban areas and a paper based survey in rural areas of Thailand. 398 educators and school executives participated in the research. The results of the research revealed that whilst most of the educators and school executives preferred using mobile technologies, guidance and training are necessary for teacher training in the use of such technologies. It became apparent that educators need a framework before using mobile learning technologies in order for it to be effectively utilised. The research analysed the current methods for the use of mobile technologies for supporting teaching and making learning activities enjoyable for the pupils.

Suparawadee Trongtortam, Hulya Francis, Mark Taylor, Andy W Symons, Sudirman Sudirman
(Liverpool John Moores University, United Kingdom (Great Britain))

1570339144

Enhancing Photovoltaic Systems Independent Learning Using e-Learning Tools

E-Learning can be enhanced using numerical simulation tools. This paper will present a tutorial on how a solar capacitance simulator (SCAPS) can be used to enhance photovoltaic systems independent learning. SCAPS is a one-dimensional solar cell simulation program that has been developed by many researchers at the Department of Electronics and Information Systems (ELIS) of the University of Gent, Belgium. This user-friendly software can be used in teaching engineering undergraduate students about numerical simulations of photovoltaics. This paper will introduce the SCAPS software and outline a tutorial to use the software which introduces photovoltaic simulations to undergraduate students in an optoelectronics course. The paper will also provide examples on the ways the software can be used to enhance the learning experience for the students on topics related to solar cells design such as generating and interpreting the current - voltage plots and calculating the efficiency of different types of solar cells.

Amal Kabalan, Duoyang Huang
(Bucknell University, USA)

1570355276

Regional Languages in Cyberspace

(Case Study: Tatarstan, Russia)

This article focuses on the functionality of the Tatar language in cyberspace. Tatar is a regional co-official language of the Republic of Tatarstan, second only to Russian in the term of the number of speakers in the Russian Federation. The aim of this work is to identify the strengths and weaknesses of Tatar on the Internet: a key challenge that Tatar is currently facing. Regional languages are becoming increasingly vulnerable in the context of the globalised world, making sociolinguistic analysis of their functional power, potential perspectives and threats extremely important. The paper provides an overview of the readiness of applied tools and software to enable the Tatar language to function in cyberspace. The research results can be useful for improving the language policy and language development processes in Tatarstan and Russia in general. Tatarstan's experience in supporting and developing its title language can benefit other multinational states and regions in managing language functionality.

Liliya Slavina, Jamila Mustafina (Kazan Federal University, Russia)

1570374672

Learning analytics in higher education - The path toward educational management intelligent systems

The rapid expansion of ICT in the area of big data analysis generates the vital demand to gain the maximum benefit of this %big data+. Business intelligence and learning analytics are recently drawing considerable attention in market and society being one of the most competitive and profitable theme areas in businesses and organizations, including higher education institutes. Business intelligence systems have already demonstrated significant impact on strategic decision making and trends forecasting. Learning analytics is going to extend the value of ICT in the field of education and training in proportion to retention, students' success and satisfaction and hence, the overall organization's performance and ranking in a bigger scope, namely toward informed, timelier, high-valued, evidenced and high-quality decisions related to the learners, and accordingly, achieving sustainable organizations improvement in a middle term, and society advancement in a longer term.

This paper focuses on investigating the potential of business intelligence approaches toward an appropriate analysis of the student learning experience by making use of predictive analytics. It deals with a variety of learning analytics initiatives at higher education institutes on a global scale, compares solutions and identifies the challenges, opportunities and barriers for learning analytics. The paper provides valuable insights into the integration and use of business intelligence in the learning analytics application area by highlighting recent research and developments. Furthermore, it suggests paths to resolving current issues in the interrelationship of higher education institutes and learning performance by designing appropriate models that aim at improving the learning outcomes for the students, and the society. The models are derived from the experience at the Sudan University of Science and Technology and serve a novel conceptual framework for educational management intelligent systems.

Fawzia Awad Elhassan Ali (Sudan University of Science and Technology, Sudan)
Fanny Klett (German Workforce ADL Partnership Laboratory, Germany)
Hani Hamdan (Laboratoire des Signaux et Systèmes, CentraleSupélec, CNRS,
Université Paris-Sud, Université Paris-Saclay, Paris, France)

1570356160

Electronic Educational Resource "Post-graduate Foreign Language" and the Obtained Learning Curve

The purpose of the article is to outline the core concept of a social-interactive learning. Electronic educational resource provides the opportunity of permanent on-line contact with a teacher that evidently contributes to the development of legitimate peripheral participationq Attention is drawn to the fact that we would see a highly interactive classroom, where guided participation allows students to obtain the necessary language skills for a shorter period of time. Attempts are made to snoop the studentsqlearning curve.

Natalya Chernova, Jamila Mustafina
(Kazan Federal University, Russia)

Session 11: e-Systems Engineering II

1570365745

A Two-Lane Traffic Model Based on Cellular Automata

Today, in approximately 65% of the countries, motorists are obliged to keep in the right lane except to pass, in which case they move one lane to the left, pass, and return to their former travel lane. If there are more than two lanes, the rule still can be applied. This is called the Keep- Right-Except-To-Pass rule. In this paper, we develop a two- lane traffic model to evaluate the performance of the traffic rule, considering tradeoffs between transportation capacities, safety under different traffic conditions and speed limit. Having discussed and considered the relationships between density and flow, density and car accident rate from the simulation results, we have come to a conclusion that the rule improves the safety to some extent, though its at the cost of the efficiency of traffic flow. Then the speed limit is proved to play both a positive and negative rule in the performance of the transportation system, i.e. it is positive correlation to the traffic flow but negative correlation to the safety. Above all, considering metal philosophy and physiology, we give a good explanation of the balance between safety and efficiency, the advantages and disadvantages of the Keep-Right-Except-To-Pass rule.

Shuai Wang (National University of Defense Technology, P.R. China)

1570356435

Recognition of Individual Zebrafish Using Speed-Up Robust Feature Matching

Animal tagging has been widely used to identify their individuality using physical methods. In small swimming animals (e.g. zebrafish), however, physical tagging is considered a painful, costly and impractical. This paper proposes a new tagging method for zebrafish that is based on Speed-Up Robust Feature (SURF) matching. In this method, a set of local features is extracted from a sequence of image frames collected through a computer vision system. The extracted set of features for each free-swimming fish is then compared with pre-extracted sets of features, stored in a database, using the SURF matching method. The feature vectors are formed by means of local patterns around key points that are detected using a box filter. The performance of the proposed tagging method is assessed experimentally using six free-swimming zebrafish. The obtained results demonstrated an average accuracy of 90% which obtained with a matching-features threshold of 15%. These findings are promising towards developing a painless, cost-effective and practical animal tagging system for zebrafish.

Qussay Al-Jubouri, Waleed Al-Nuaimy, Majid A. Al-Taee, Iain Young
(University of Liverpool, United Kingdom (Great Britain))

1570356465

The FL-SMIA Network: A Novel Architecture for Time Series Prediction

In this paper we propose the FL-SMIA model. This is a novel neural network model that combines the principles of the Functional Link Neural Network (FLNN) with the Self organizing Multilayer Neural Network using the Immune Algorithm (SMIA). We describe the FL-SMIA architecture and operation and evaluate its predictive performance on different financial time series in comparison to other neural network models. The FL-SMIA model combines the higher-order inputs of the tensor-product FLNN, i.e. the products of raw input features, with the self-organizing hidden layer of SMIA that dynamically grows and adapts to the input vectors. The FL-SMIA has two advantages over other models. First that it can dynamically adapt to growing data with model that grows increasingly complex. Second, it keeps an explicit representation of the patterns it recognises in the data. Experimental results show that FL-SMIA improves performance as measured by annualised return in five-days-ahead and one-day-ahead prediction tasks for share prices and exchange rates over the SMIA networks alone and over standard multilayer perceptrons. It performs on the same level as the FLNN, sometimes better but not significantly so. The result that FLNN and FL-SMIA outperform multilayer models indicates that particularly the higher-order features contribute to the improved performance and motivate further research into mixed neural network architectures for financial time series prediction.

Asmaa Mahdi (City, University of London, United Kingdom (Great Britain))
Tillman Weyde (City University, United Kingdom (Great Britain))

1570356324

The Conditions for Database of Social Advertising in Russia

The article considers social advertising database in Russia. It examines linguistic and stylistic properties and peculiarities of social advertising and the impact it has on public consciousness. The authors deem it necessary to create a common database on social advertising in Russia in order to facilitate the analysis of economic impact and evaluate the capacity to exert effect on mainstream audience as well as determine strategies to build advertising campaigns

Aigul Khanova, Tatyana Mazaeva, Filus Gallyamov
(Kazan Federal University, Russia)

1570354889

Integrated Routing Scheme and Inverter Switch to Develop the Mobile Controlled Energy Saving System

A solution of inverter switch and routing scheme are integrated to develop a mobile controlled energy saving system (MCESS) proposed in the article. For the unsaturation state problem of an n-channel metal-oxide-semiconductor field-effect transistor (MOSFET) acting as an inverter switch, and a routing scheme are solved in this paper for the development of an energy saving control system. The developed solution is experimentally verified by deploying the referred as MCESS to automatically switch in order to control the energy output to the loading appropriately. A control system with such a solution can replace the traditional sustainable energy devices, and obtain a much longer lifetime and a steady state of the storage equipment in the MCESS. Moreover, the proposed energy control system integrates a routing solution that employs local area network (LAN) with the WiFi protocol is implemented in this study to transmit packets of the low power multi-purpose regulator circuit and the instant feedback display.

Joy Iong-Zong Chen (Da-Yeh University, Taiwan)

1570354918

Soft Mathematical System to Solve Black Box Problem Through Development the FARB Based on Hyperbolic and Polynomial Functions

This work attempts to design a method for computer based mathematical model of multi-parametric datasets that their features are fully-automatic structural and parametric optimization of models. This method has different inputs and one output as a subset of components for the base function F. In addition, several functions in modelling the classified rules are used including 12 polynomials and 6 hyperbolic functions. This work combines the advantage of data mining algorithms and Fuzzy All-Permutation Rule Base (FARB). In order to evaluate the performance of the proposed method, two classifications based on association rules case studies were used in an attempt to design a dynamic mathematical method. The first case study takes the virtual rules which consist of four rules, while in the second case study actual rules are selected. According to the experimental results, not only enhanced accuracy can be achieved by the proposed method, but also it can be used for intelligent data analysis for huge and small datasets.

Samaher Al-Janabi (Babylon University, Iraq)

1570367333

Impacts and Benefits of Health Informatics in Saudi Arabia: A Weblink Pilot Project

Current efforts move to improve healthcare services in Saudi Arabia (SA). Given the essential roles of these services within the country, ongoing effort to improve health informatics services in SA is required in order to ensure the sector is up-to-date. One area for improvement focuses on the referral system in place in Madinah city. This paper presents a solution to the above problem by proposing a Web-based healthcare information system link that can connect four healthcare centres in Madinah city. This will serve as a pilot project. This link could help healthcare providers to access patient information within their own system. Many healthcare applications have problems with interoperability. Hence, one of the aims of this research is to look at system integration of some of the existing healthcare information systems.

Jade Hind, Abir J Hussain, Naif Almughamisi, Mark Allen
(Liverpool John Moores University, United Kingdom (Great Britain))
Jamila Mustafina (Kazan Federal University, Russia)

1570369778

Dynamic Area of Interest Management for Massively Multiplayer Online Games Using OPNET

Nowadays, Massively Multiplayer Online Games (MMOGs) become one of the significant kind of online games. It can support over millions of concurrent players deployed over the world and participating with each other within a single online game. The rapid increase in the number of players for MMOGs has led to some issues with the demand of adding new servers. Resulting in a considerable increase in costs for the game industry and effect to the quality of service offered to users. In order to provide a scalable MMOGs, area of interest management (AoIM) is considered a fundamental ingredient to decrease unnecessary network traffic. In this paper, we have proposed a novel dynamic area of interest management to minimize the end-to-end delay as well as network traffic of MMOGs Hybrid P2P system. We have used OPNET Modeler 18.0, in particular the custom application to simulate the new technique, which required the execution of new nodes models and behaviors in the simulator to emulate correctly the new architecture. The scenarios comprise both MMOGs hybrid P2P and client-server system in order to evaluate the game communication with (125, 500, and 1000) peers. The simulation results show that AoIM of MMOGs based on hybrid P2P architectures produce low delay and low network traffic received compared to MMOGs based on client-server system without AoIM.

Sarmad Abdulazeez, Abdennour El Rhalibi, Dhiya Al-Jumeily
(Liverpool John Moores University, United Kingdom (Great Britain))

Notes

Notes

Notes