

Conference Abstract

2017 International Conference on Circuits, System and Simulation
(ICCSS 2017)

2017 International Conference on Consumer Electronics and Devices
(ICCED 2017)

July 14-17, 2017

University of Greenwich, London, UK

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Table of Contents

Welcome Remarks	2
Keynote Speakers & Plenary Speakers	5-11
Conference Schedule	12-14
Session 1- System model and computer application technology	15-18
Session 2- Electronic information technology	19-21
Session 3- Communication theory and development technology	22-25
Session 4 - Power electronics and equipment development	26-29
Presentation Quick Review-Oral	31-32
Conference Venue	33
Upcoming Conferences	34-35
Notes	36-37

Do you want to find your own paper information very quickly?
Please turn to Page 31-32 to locate your own session!!

Welcome Remarks

Dear Colleagues,

Welcome to London, UK to attend 2017 International Conference on Circuits, System and Simulation (ICCSS 2017) and 2017 International Conference on Consumer Electronics and Devices (ICCED 2017) during July 14-17, 2017, which are published by IEEE, sponsored by University of Greenwich, UK; University of Portsmouth, UK; National Autonomous University of Mexico, Mexico. We're confident that over the days you'll get theoretical grounding, practical knowledge, and personal contacts that will help you build long-term, profitable and sustainable communication among researchers and practitioners working in a wide variety of scientific areas with a common interest in Circuits, System and Simulation, and Consumer Electronics and Devices.

We wish to express our sincere appreciation to all the individuals who have contributed to ICCSS 2017 and ICCED 2017 in various ways. Special thanks to IEEE, University of Greenwich, UK; University of Portsmouth, UK; National Autonomous University of Mexico, colleagues of conference chair, program committee, technical committees, authors and so on. Their high competence, their enthusiasm, their time and expertise knowledge, enabled us to prepare the high-quality final program and helped to contribute to a successful event.

Once again, thanks for coming to this conference, we are delegate to higher and better international conference experiences. We will sincerely listen to any suggestion and comment; we are looking forward to meeting you next time.

Instructions for Oral Workshop

Note: The following time arrangement is for reference only. In case any absence or some presentations are less than 15 minutes, please come before your session starts.

*A best presentation will be selected from each session which will be announced and awarded an excellent oral presentation certificate at the end of this session.

Devices Provided by the Conference Organizer:

- ✧ **Laptops (with MS-Office & Adobe Reader)**
- ✧ **Projectors & Screen**
- ✧ **Laser Sticks**

Materials Provided by the Presenters:

- ✧ **PowerPoint or PDF files**
- ✧ **Poster Presentation: A1 Size, Portrait Direction**

Please copy your slide file to the desktop before session starts

During your poster session, the author should stay by your poster paper to explain and discuss your paper within visiting

Duration of Each Presentation:

- ✧ **Regular Oral Session: about 15 Minutes of Presentation including Q&A.**
- ✧ **Keynote Speech: 40 Minutes of Presentation including Q&A.**

About Dress Code

- ✧ **All participants are required to dress formally. Casual wear is unacceptable.**
- ✧ **National formal dress is acceptable.**

Tutorial 15:00pm - 16:00pm, 14th July



Prof. Ezendu Ariwa,
University of Bedfordshire, UK

Speech Title: Consumer Electronics and Corporate Social Responsibility: Green Technology Sustainability - How to Publish in Top Academic and Professional Journals

Goal and Scope

The Workshop on Consumer Electronics and Corporate Social Responsibility: Green Technology Sustainability aims to bring together research contributions from academia, research scholars, business entrepreneurs, practitioners, managers and policy makers and those responsible in delivering Consumer Electronics, Corporate Social Responsibility (CSR), Green Technology (IT and IS) and Engineering Sustainability in achieving competitive advantage and cost savings in modern organizations both industrial and business sectors.

The workshop will present topical issues, problem based learning, new research related to the theory and practice of recent trends in technology and computing applications, innovation and engineering sustainability, digital communication, social network assistive applications, information technologies, green technology, digital enterprise, engineering and corporate sustainability, systematic risk management, e-waste disposal and globalization.

Keynote Speakers



Prof. Ezendu Ariwa,
University of Bedfordshire, UK

Professor Ezendu Ariwa is Professor of Practice in Computing at the University of Bedfordshire, United Kingdom, Faculty of Computer Science and Technology. He also holds the position of Visiting Professor, Gulf University, Bahrain, Visiting Professor, University of Lagos, Nigeria and Visiting Professor, Kano State Polytechnics, Nigeria as well as Visiting Affiliate of the Green IT Observatory, RIMT University, Australia and Visiting Affiliate of ICT University, USA. He also holds the position of Director - Technical and Non-Executive Director and Research Professor for Enterprise Projects at Sun Bio IT Solutions Pvt. Ltd, India. He is also a member of the Elite Group of The British Computer Society (BCS), member of British Institute of Facilities Management and Fellow of Global Strategic Management, Inc., Michigan, USA and Member of the UK Council for Health Informatics. He is the Co-ordinator of the Digital Enterprise Research Group (DERG), African Research in Business Group (ARBG) and working with the team to achieve African Business and Enterprise Research Observatory (ABERO) at the London Metropolitan Business School. The ABERO achieved good collaboration with multicultural SMEs in the United Kingdom, with respect to mentoring and working on joint professional development enterprise programmes. He has experience of doctoral research supervision as well as doctoral external examiner for various Universities both in the UK and internationally. He has a good research profile and the Founding Editor-in-Chief of the International Journal of Green Computing (IJGC), Editor-in-Chief of the International Journal of Computing and Digital Systems (IJCDS), Journal of E-Technology, and the Associate Editor of the International Journal of E-Politics and the Associate Editor of International Journal of Distributed Systems and Technologies (IJ DST). He is a member of Policy Co-ordination Committee of the International Research Foundation for Development (A Corporation of NGO in special Consultative status with the Economic and Social Council of the United Nations). His research interest includes: Green Technology and Corporate Sustainability, Strategic Information Systems, E-Learning and Knowledge Management, Consumer Electronics and Broadcast Technology, ICT for Development and Facilities Management, Knowledge Transfer in Developing Economy, Open Learning and Social Enterprise, Green Communications and Corporate Social Responsibility, Renewable Energy and Climate Change, Social Media and Energy Management Systems.

Speech Title: Consumer Electronics and Green Technology Sustainability for Facilities Management in Electronics Retail Sectors

Abstract: This research concerns Consumer Electronics and Green Technology Sustainability for Facilities Management in Electronics Retail Sectors. The research demonstrates the benefits of Consumer Electronics driven Facilities Management (CEdFM) and emphasised that it may be realized in a number of ways. The approach in this research work, given the immaturity of the Consumer Electronics driven Facilities Management field, is exploratory and descriptive.

This research treats the claims of the benefits made by proponents of various Consumer Electronics driven Facilities

Management (CEdFM) approaches, and the application of such approaches to the electronics retail sectors.

The research gives a means of addressing the questions “What Consumer Electronics driven Facilities Management practices are used by certain Electronic retailers, what benefits do they identify, and how do these benefits compare to the stances taken in the Consumer Electronics driven Facilities Management and Electronic retailing literatures?” One feature of the CEdFM literature that receives particular attention here is the contrast some see between traditional Facilities Management practices and the emerging set of Consumer Electronics driven Facilities Management possibilities. Retailing, and in particular, electronic retailing is chosen as the sector for study, in order to provide a Consumer Electronics - literate background where these two contrasting sets of claims might be investigated.

Green Technology Sustainability remains an essential aspect of providing pedagogical portfolio for delivering Consumer Electronics driven Facilities Management that will enable the achievement of energy savings and environmental sustainability in the business and industrial sectors. The issue of virtual usability and awareness management strategy may result in achieving excellence in energy efficiency and usage, environmental considerations and energy re-use strategic models. The return on investment (ROI) as strategic outcome of the model may restore organizations with huge energy wastage without thinking of cost, environmental impact and carbon emissions.

This research aims to identify the problems, and investigate the technological gap and management set back in terms of resource utilization within the UK Consumer Electronics driven Facilities Management companies.

As the key research intentions stated that this research investigation is based on an assumption that:

‘there is a significant gap between the Consumer Electronics driven Facilities Management based approach and the traditional facilities management practices due to low level of investment in Research and Development (R&D) and the short-term views of company management on capital investment and the returns that Consumer Electronic retailers see as immediately required’.

The British economy grows at a European rate. To bring Britain to the level of technology enjoyed by competitors in Consumer Electronics driven Facilities Management companies will require high investment in Consumer Electronics industries.



Prof. Tayeb Mohammed-Brahim Université de Rennes, France

Tayeb Mohammed-Brahim is currently professor in Rennes 1 University (France), Head of Microelectronics & Microsensors Department of the Institute of Electronics and Telecommunications of Rennes and Director of the Common Center on Microelectronics in the west of France. He got his PhD (Doctorat d'Etat) in Paris-XI University (France) and he founded the thin-film Laboratory in Algiers University (Algeria). Then he moved to Caen University (France) where he created the reliability Laboratory. After that and since 2000, he moved to Rennes 1 University where he became on 2007 the head of Microelectronics Group becoming the Microelectronics and Microsensors Department after 2012. He is mainly involved in the field of thin film and nanowire devices based on amorphous, micro-poly crystalline silicon films or organic films: Photovoltaic cells, Thin Film Transistors for flat panel displays and OLEDs, chemical and mechanical sensors. Presently, his main activities focus on flexible electronics. He is author of more than 300 papers on these different fields.

Speech Title: Silicon Based Flexible Electronics

Abstract: Flexible electronics is the new paradigm, enlarging the applications of electronics to new fields as health, transport, robotics,... Huge works are devoted now to this electronics involving great number of ways. Different materials from known silicon to multiple organic materials and renewed metal oxides are used. Different techniques from known photolithography to new deposition in solution ones are used also. The main drawback of a lot of ways is the lack of reproducibility in the process and/or of reliability of the devices.

During its long history, silicon showed its ability to overcome many issues, working at high frequency, producing reliable electronics at low temperature on glass,

The talk shows that directly crystallized deposited silicon at low temperature is the right material when bendable system including treatment electronics and sensing functions is needed. This is true particularly when process reproducibility, electrical and mechanical reliability are the most important parameters implying the success of the technology. Indeed, these parameters are the main issues when we need to go beyond the publication of a paper, towards actual commercial application.

Electrical and mechanical performances of microcrystalline silicon thin film transistors and deformation sensors on 25 μm thick flexible plastics under high bending, still 0.75 mm curvature radius, are presented. These devices are fabricated directly on this substrate at a maximum temperature of 180°C

Examples of the most important success in this story are given. Applications of the devices in different fields, health particularly, are briefly described.



Dr. BRANISLAV VUKSANOVIC, University of Portsmouth, UK

Branislav Vuksanovic was born in Osijek, Croatia in 1962. He graduated from the University of Belgrade, Serbia with degree in Electrical and Power Engineering. He holds MSc degree in Measurement and Instrumentation from South Bank University, London and a PhD in Active Noise Control from the University of Huddersfield, UK. Previously, he worked as a Project Engineer for Croatian Electricity Board in Osijek, Croatia. During his academic career he worked as a Research Fellow at Sheffield and Birmingham Universities on Optical Brain Imaging and Medical Video Compression projects. He also worked as a Lecturer at the University of Derby where he was a member of Sensors and Controls Research Group. Currently he works as a Senior Lecturer at the University of Portsmouth, School of Engineering. He has published papers in the field of active noise control, biomedical signal processing and pattern recognition for intrusion detection and knowledge based authentication. He also published one book in Digital Electronics and Microcontrollers field. Dr Branislav Vuksanovic is a member of IET, ILT and IACSIT. His current research interests are in the application of pattern recognition techniques for power systems and analysis of ground penetrating radar and ECG data..

Speech Title: Adaptive Digital Filters - Theory and Applications

Abstract: This talk will cover basic theory and some applications of a special group of algorithms and techniques used for digital signal processing known as adaptive digital filters. Those filters are different from the ordinary, fixed digital filters in a sense that they can change their behaviour and properties during the operation by changing its coefficients. This leads to interesting properties of those algorithms and wide range of applications. Main theory and rules behind the adaptive coefficients change will be described in this talk and the main equations used to implement some basic adaptive algorithms given. Four main configurations in which those filters can be employed will be described and some of the applications such are active noise control and system identification explained and demonstrated at the end of the talk. Finally, some interesting industrial and commercial applications of adaptive filters including noise cancellation headphones, electrocardiography and medical imaging and similar will be discussed and demonstrated.

Plenary Speakers



Prof. Frank Werner,
Otto-von-Guericke-Universität Magdeburg, Germany

Frank Werner was born in Magdeburg, Germany, in 1955. He received a Diploma degree (with honors) from the Otto-von-Guericke University of Magdeburg, Magdeburg, Germany, in 1980. He received his Ph.D. degree (with summa cum laude) from the same university in 1984. In 1987, he had a 5-month research stay in Minsk, Belarus, and a 1-month stay at the Banach center in Warsaw, Poland. In 1989, he defended his Habilitation thesis. In 1992, Werner received a grant from the Alexander-von-Humboldt Foundation for a research stay at the University of Osnabrück, Germany. In 1994, he had a teaching stay at the Uppsala University, Sweden. Currently, he serves as an Extraordinary Professor at the Faculty of Mathematics of the Otto-von-Guericke University of Magdeburg, Germany. Werner is mainly interested in scheduling problems, operations research, graph theory, modeling and simulation. He has about 240 papers in international journals and book contributions, and he was a referee for more than 40 international journals. Werner is also one of the authors of two textbooks and two monographs. He is an Associate Editor of International Journal of Production Research, Journal of Scheduling and Operations Research and Decisions as well as a member of the Editorial Board of 10 further journals. He was also a Guest Editor of 6 special issues in different journals.

Speech Title: Material Handling Tools for a Discrete Manufacturing System: A Comparison of Optimization and Simulation

Abstract: The improvement of the performance of material handling tools (MHT) and the work in process (WIP) in a discrete manufacturing system have a great importance for increasing the efficiency of the production. To this end, the static and dynamic status of MHTs is analyzed in this paper. A Markov decision process (MDP) is used to model the MHT problems. The quantified relationships between MHTs and WIP will be discussed within the CONWIP (constant WIP) and Little's law methodologies. A dynamic programming (DP) based algorithm is developed to determine a solution for the MDP model. To reduce the computational complexity of the DP algorithm, the states are grouped to iterate appropriately with different priorities of the states. Computational experiments are conducted in a discrete semiconductor factory and the proposed MDP+DP method is compared with simulation. The computational results show that the developed method produces rather good feasible solutions.



Prof. Guennadi Kouzaev, Norwegian University of Science and Technology, Norway

Guennadi A. Kouzaev is a Professor at the Department of Electronic Systems of the Norwegian University of Science and Technology - NTNU. He has a PhD Degree in Physics and Mathematics from the Kotelnikov's Institute of Radio Engineering and Electronics, USSR Academy of Science, Moscow. Professor Kouzaev also has a Doctor of Sciences Degree in Electrical Engineering from the Moscow State Institute of Electronics and Mathematics - a branch of Higher School of Economics.

His research interests are in Computational Electromagnetics and Microwave Techniques, Microwave-assisted Heating and Chemistry, Quantum Physics and Quantum Electronics, High-speed Electronics, and Computers.

In 2012, he was with the European Laboratory for Nonlinear Sciences - LENS as a Sabbatical Professor in Cold Atom Physics Theory and Modelling. Earlier, he spent several years at the McMaster University, Hamilton, Canada working in Electromagnetics.

Professor Kouzaev has published more than 160 papers, abstracts, inventions, and a Springer book on advanced electromagnetics.

He is an International Expert at the Russian Science Fund and German Aerospace Centre (DLR-PT) and a Member of the IEEE Society and Faculty Row (USA). He served many international conferences and reviewed journal papers and book manuscripts.

Professor Kouzaev is a Russia Government Prize Winner (1997) and a Young USSR Science Award Winner (1990).

Speech Title: Kron's Circuit Models in Quantum Electronics Simulations by Available Circuit Simulators

Abstract: The evolution of electronic circuits, according to the Moor's law, tends to the high-dense integrations with the components of the size comparable to the de' Broglie wavelength. It is supposed that the electronics of future will integrate the classical micro-, nano-, and quantum elements, and the overall number of these integrated components may reach several hundreds of millions per chip. The development of new software tools for these integrations is a very difficult task, and it is supposed that the best way is the enhancement of the traditional computer aided design (CAD) tools by some means allowing the treatment of quantum-mechanical equations by fast circuit simulators. In this Lecture, the Author intends to give a review on the circuit modeling of quantum equations since the first works of G. Kron to the recent results of his team on the integration techniques of these equivalent circuits into the electronic simulators. Particularly, there are many applications are considered on modelling of Schrödinger and Pauli-Schrödinger equations describing the electron transport in conventional and magnetized quasi-2D waveguides showing topological properties towards the confining potential perturbations. Applications of cold matter trapping are modeled with 2-D non-linear Schrödinger equations solved by commercially-available circuit simulators and compared with known numerical and experimental results. An analysis of accuracy of some circuit simulators on the solution of Schrödinger equations is given in this Lecture. It is noticed on the necessity to use the order-reduction techniques to quantum-mechanical equations applied earlier to classical circuits to reduce the simulation time for simulation realistic quantum-mechanical integrations



Prof. Massimo Poncino Politecnico Di Torino, Italy

Massimo Poncino received the Ph.D. degree in Computer Engineering and the Dr.Eng. degree in Electrical Engineering from the Politecnico di Torino, Torino, Italy. He is currently a Full Professor of Computer Engineering at Politecnico di Torino. His research interests include several aspects of design automation of digital systems, with particular emphasis on the modeling and optimization of low-power systems. He is the author or coauthor of more than 300 journal and conference papers. He is an Associate Editor of the ACM Transactions on Design Automation of Electronic Systems and of IEEE Design & Test. Prior to that, he was an Associate Editor of IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (2006-2012). He was the Technical Program Co-Chair (in 2011) and the General Chair (in 2012) of the ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED). He serves on the Technical Program Committee of several IEEE and ACM technical conferences, including DAC, ICCAD, ISLPED, DATE, ASP-DAC, GLSVLSI, and CODES-ISSS. Prof. Poncino is a Senior Member of IEEE..



Speech Title: WHAT YOUR MOBILE DEVICE SHOULD (BUT DOES NOT) DO TO SAVE ENERGY





Abstract: The main constraint of most personal consumer electronic devices is not computational power, but rather their energy consumption. These devices rely in fact on fast multi-core platforms with powerful accelerators and could be even exploited better, if it were not to the stringent constraints imposed by batteries.

The research community has widely addressed the issue of the energy-efficiency in electronic devices since at least 20 years, by introducing various solutions from the device to the system level; however, for a number of reasons in most cases these ideas did not find their way into commercial products in spite of theirs.

In this talk we will overview the approaches that are more promising for their deployment in consumer electronic devices, by quantifying their expected benefit and their economic sustainability

Day 1, Friday, July 14, 2017 Arrival Registration & Tutorial	
10:00am - 12:00pm	Arrival Registration
14:00pm - 16:30pm	
15:00pm - 16:00pm	Tutorial guided by Prof. Ezendu Ariwa < QA110 >

Day 2, Saturday, July 15, 2017 Keynote Speeches & Authors' Presentation		
08:30am-08:35am < QA175 >	Opening Remarks	Prof. Ezendu Ariwa, University of Bedfordshire, UK
08:35am - 09:15am < QA175 >		Keynote Speech 1 Prof. Ezendu Ariwa, University of Bedfordshire, UK Speech Title: <i>Consumer Electronics and Green Technology Sustainability for Facilities Management in Electronics Retail Sectors</i>
09:15am – 09:55am < QA175 >		Keynote Speech 2 Prof. Tayeb Mohammed-Brahim Université de Rennes, France Speech Title: <i>Silicon Based Flexible Electronics</i>
09:55am-10:10am	Group Photo & Coffee Break	

<p>10:10am-10:50am < QA175 ></p>		<p>Keynote Speech 3 Dr. BRANISLAV VUKSANOVIC, University of Portsmouth, UK</p> <p>Speech Title: <i>Adaptive Digital Filters - Theory and Applications</i></p>
<p>10:50am-11:20am < QA175 ></p>		<p>Plenary Speech 1 Prof. Frank Werner, Otto-von-Guericke-Universität Magdeburg, Germany</p> <p>Speech Title: <i>Material Handling Tools for a Discrete Manufacturing System: A Comparison of Optimization and Simulation</i></p>
<p>11:20am-11:50am < QA175 ></p>		<p>Plenary Speech 2 Prof. Guennadi Kouzaev, Norwegian University of Science and Technology, Norway</p> <p>Speech Title: <i>Kron's Circuit Models in Quantum Electronics Simulations by Available Circuit Simulators</i></p>
<p>11:50am-12:20pm < QA175 ></p>		<p>Plenary Speech 3 Prof. Massimo Poncino, Politecnico Di Torino, Italy</p> <p>Speech Title: <i>WHAT YOUR MOBILE DEVICE SHOULD (BUT DOES NOT) DO TO SAVE ENERGY</i></p>
<p>12:20pm-13:15pm</p>	<p>Lunch Time</p>	
<p style="text-align: center;">Afternoon Sessions</p>		
<p>< QA110 ></p>	<p>Session 1 (13:15pm-15:45pm)</p> <p>Topics: <i>System model and computer application technology</i></p>	<p>Session 3 (15:45pm-18:45pm)</p> <p>Topics: <i>Communication theory and development technology</i></p>

16:00pm-16:15pm	Coffee Break	
<i>< QA120 ></i>	Session 2 (13:15pm-15:45pm)	Session 4 (15:45pm-19:00pm)
	<i>Topics: Electronic information technology</i>	<i>Topics: Power electronics and equipment development</i>
Start from 19:00pm		
Dinner Time		

Note: The following time arrangement is for reference only. In case any absence or some presentations are less than 15 minutes, please arrive before your session starts.

SESSION 1 < System model and computer application technology > 13:15pm-15:45pm <QA110>	
Session Chair: <i>Prof. Frank Werner,</i> <i>Otto-von-Guericke-Universität Magdeburg, Germany</i>	
<p style="text-align: center;">Opening Speech</p> <p style="text-align: center;">A307-A 13:15pm-13:30pm</p>	<p>Architecture and Technology of the Simulation System for Intelligent Unmanned Air Vehicles <i>Wenxing Fu</i>, Kang Chen, Xiaofei Chang, Supeng Zhu Northwestern Polytechnical University, China</p> <p>Abstract—Unmanned Air Vehicles (UAVs) will play more and more important role for both civilian and military applications. In order to realize their full potential, UAVs need to be both intelligent and autonomous. It is anticipated that future applications will require that UAVs could realize multiple sensors data fusion and situational awareness, so much that deliberative thinking and self-conscious reflection. Meanwhile with the complexity of the applications, it needed that multiple UAVs could perform in a cooperative mode, share information and coordinate with other air or ground assets. So testing the robustness and validity of these intelligent systems in a realistic synthetic environment is an important process. It is logical therefore, to develop a suitable simulation architecture and environment in which the intelligent UAVs can be assessed.</p>
<p style="text-align: center;">A215-A 13:30pm-13:45pm</p>	<p>A Study of the Emerging Role of Information Technology in Autonomous Car <i>Yi An Tsai</i> National ChengChi University, Taiwan</p> <p>Abstract—Information technology (IT) has brought such a great change to people and business, and even decision-making. In various application of IT, IT plays diverse roles which could automate business processes, support decision-making, integrate resources, and enable transformation and innovation. However, with the emerging technology of artificial intelligence (AI), there is a new IT role than roles mentioned above. In order to understand the possible new IT roles affected by AI, we chose the autonomous car, which was one of the typical cases of AI, as the study case. The objective of the research is to understand the new roles played by IT with autonomous car. We focused on two questions: (1) how IT impacts decision-making in autonomous car; and (2) what the role that IT and human plays during decision-making process is.</p>
<p style="text-align: center;">A220-A 13:45pm-14:00pm</p>	<p>Evacuation dynamics considering the impact of communication and memory of pedestrian via an extended cellular automaton model <i>Yanhong Fan, Xingli Li, Fang Guo</i> Taiyuan University of science and technology, China</p> <p>Abstract—An extended cellular automaton model is proposed to simulate pedestrian evacuation in view and hearing limited condition. Two types of pedestrian are assumed: informed individuals know the exit location and uninformed individuals. The uninformed individuals can communicate with the informed ones within their perceptual fields, thus learn to know and memorize the exit location. The numerical simulations show that communication and memory can enhance the evacuation efficiency. The impact of communication and memory on the evacuation efficiency including an emergency exit is also be explored.</p>
<p style="text-align: center;">A223</p>	<p>Thermal Dynamic Modeling and Simulation of a Heating System for a Multi-Zone Office Building Equipped with Demand Controlled Ventilation Using MATLAB/Simulink</p>

<p>14:00pm-14:15pm</p>	<p><i>Ali Behravan</i>, Roman Obermaisser, Amirbahador Nasari Beijing University of Posts and Telecommunications, Beijing China</p> <p>Abstract—Energy consumption of the office buildings demonstrates potential energy savings. One of the major parts of the energy consumption in these building is related to the heating, ventilation and air conditioning systems which keep thermal conditions in a comfort zone and indoor air quality in an acceptable range. Nowadays, building management systems are developed to reduce the energy consumption of these systems besides supplying occupants with comfort conditions. Furthermore, these complex systems can be faced by different operation faults. To diagnose and detect these faults, getting the knowledge about the system behavior through modeling is substantial. This paper introduces a scalable multi-zone office building model that was established in Matlab/Simulink using Simscape toolbox. The model contains the thermal dynamics of the building elements and the heating control system which is equipped with demand-controlled ventilation. The results show that the model can correctly describe and predict the dynamics of the system. The proposed approach is intended to be used for HVAC systems in building automation with a specific focus on faults diagnosis and detection.</p>
<p>A310 14:15pm-14:30pm</p>	<p>A Robust Detection Algorithm for Image Copy-Move Forgery in Smooth Regions <i>Mahmoud Emam, Qi Han</i>, Qiong Li, Hongli Zhang Harbin Institute of Technology, China</p> <p>Abstract—Region duplication or simply Copy-Move forgery is one of the most common forgery types in digital images where a region of the image is copied and then pasted into another location in the same image. Many forgery detection algorithms have been proposed to detect such type of forgery. However, most of the existing algorithms fail when the smooth regions are used to cover up the forgery. In this paper, we propose a robust region duplication forgery detection method based on extracting local extrema points from Difference of Gaussians (DoG) operator. DoG is used because it is a good approximation for the Laplacian of Gaussian (LoG) and much faster to calculate. To extract the descriptive features and hence improve the matching performance, Multi-support Region Order-based Gradient Histogram (MROGH) descriptor is adopted. Experimental results show the robustness of the proposed method compared with the state-of-the-art methods.</p>
<p>A408 14:30pm-14:45pm</p>	<p>Real-Time Benchmark Set Synthesis Based on pWCET Estimation and Bounded Hyper-Periods <i>Ashraf Suyyagh</i>, Zeljko Zilic McGill University, Canada</p> <p>Abstract—In evaluating performance, schedulability, and energy efficiency metrics for real-time systems, numerous algorithms have been proposed to construct synthetic tasksets for simulation. The resulting taskset characteristics should ideally reflect real workloads while the algorithms generating these tasksets should be efficient. Any experimentation using these tasksets will highly depend on their properties. Current approaches construct the sets by choosing taskset periods and utilisation from statistical distributions and compute the task worst case execution times accordingly. Tasks are generated through timed loops or matrix operations up to the specified task WCET. At times, the taskset hyper-period is bounded to minimise simulation interval through selected assignment of task periods. However, tasks which burn processor cycles through loops and matrix operations do not always reflect realistic task loads. In this paper, we propose a methodology for generating realistic tasksets based on available embedded benchmarks. We extend on previous work and propose new algorithms: CPA-AU/DU (Compute-Propagate-Adjust Ascending/Descending Utilisation) which efficiently pair taskset WCETs with selected discrete periods. Our tasksets have bounded and feasible simulation interval and meet desired total utilisation with minimum digression errors. We also show that our algorithms run in polynomial time.</p>
<p>D01-A</p>	<p>Electrochemical properties of ZnO coated LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ cathode for lithium secondary battery</p>

<p>14:45pm-15:00pm</p>	<p>Su-Jin Jin, Sang Mun Jeong, <i>Byung-Ki Na</i> Chungbuk National University, Korea</p> <p>Abstract—LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ is one of promising cathode materials for lithium ion batteries due to its lower cost and higher specific capacity than commercial cathode material such as LiCoO₂. The effects of Al doping were attributed to the suppression of phase transition or lattice changes during cycling, as well as to the suppression of the decomposition reaction between the electrode and electrolytes. However, LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ has some problems such as poor thermal stability, unstable cyclic performance, and insufficient rate capability for commercialization. Surface coating of LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ with ZnO was attempted to improve the electrochemical and thermal properties. Starting materials was LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ powder supplied from Ecopro Co. Ltd., Korea. Zinc acetate dihydrate (Zn(CH₃COO)₂•2H₂O, 98+%, Sigma-Aldrich) and methanol(CH₃OH, 99.8+%, Alfa Aesar) were used as precursors. Zn(CH₃COO)₂•2H₂O and methanol were mixed for 10 minutes. The mixture was added to LiNi_{0.8}Co_{0.15}Al_{0.05}O₂. The slurry was heated up to 80°C until the powder was totally dried. Pristine LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ was coated by using ZnO. The XRD patterns of the sample were indexed as a layered α-NaFeO₂ type structure. The XRD patterns of ZnO coated LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ had an identical structural group to pristine LiNi_{0.8}Co_{0.15}Al_{0.05}O₂, with no c-site disordering. An initial capacity of pristine LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ was higher than 0.5, 1wt% ZnO coated LiNi_{0.8}Co_{0.15}Al_{0.05}O₂. 0.5wt% ZnO coated LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ showed greater cyclic performance at 0.5C-rate for 50 cycles. More experiments should be done to improve electrochemical performance of LiNi_{0.8}Co_{0.15}Al_{0.05}O₂.</p>
<p>D08 15:00pm-15:15pm</p>	<p>Consumer Electronics May Deliver More Than Consumer Applications: Being as Social Problem Solver and CRM Promotor <i>Yu-Tso Chen</i> National United University, Taiwan</p> <p>Abstract—The modern consumer electronics (CE) integrating the features of computer, communications equipment, and mobile handheld device is able to carry out a great amount of consumer applications for entertainment, online business, virtual-community activities, and so on. The modern CE successfully delivering consumer applications advances the operation of personal living affairs; on such basis, whether a powerful CE like a smartphone can contribute to other fields not just consumer applications is an interesting issue worthy of investigation. This paper presents a study focus on leveraging smartphone-supported functions to deal with social problems and to enhance governmental administration works. In order to practically invite stakeholder needs into designing a reasonable service model, a novel service innovation process, SIPSEV, is proposed for guiding the system implementations. Through the SIPSEV process, two prototypes ICT-enabled school bullying treatment (I-SBT) and intelligent National Park (I-NP) are built. The purpose of I-SBT is to provide an alternative SBT approach instead of the traditional ones that are getting invalid; the I-NP is an ICT-based service potential to improve the relationship between the visitors and the national park headquarters. The introduced conceptual approach with the shown prototypes indicates a reasonable ICT-mediated practice of shifting the paradigm of modern CE applications; furthermore, it also addresses a valuable research direction of inviting smartphone applications in conjunction with necessary ICT technologies to solve social problems and improve the performance of citizen relationship management.</p>
<p>D10 15:15pm-15:30pm</p>	<p>User Experience on XD Theatre: Body Gestures and Postures of Deaf and Normal Children <i>Nur Fadhlina Ab Rahman</i>, Zan Azma Nasruddin, Nor Aziah Daud, Fauziah Redzuan, Rogayah Abdul Majid, Jamaliah Taslim UNIVERSITI TEKNOLOGI MARA (UiTM), MALAYSIA</p> <p>Abstract—This study observes on the significant user experience focusing on body gestures and body postures towards XD Theatre between deaf and normal children. Less extensively studied field of bodily expression of emotion that models how people communicate emotion through body gestures and postures and how people make inferences about them. Two</p>

	<p>groups were involved in this study: an experimental group which included three deaf and three normal children. Their gestures and postures for both groups were video recorded. An interview using sign language was conducted on the deaf children after the movie in order to understand their feelings. The analysis was done through video observation at six different scenes on fear and surprise emotion. The findings discovered different gestures and postures between the groups. Also even though the deaf children are fascinated and immersed into the movie through other senses including eyes, nose and hands, they felt less fear and surprise watching the movie. In addition, based on the interview, due to their limitation of not be able to hear sound effect in the movie, at certain scene, they felt sudden shock on fear and surprise. Therefore, recommendation for the future on valuable features for them in the interface design in XD theatre should be considered to stable their emotion while watching it.</p>
<p>D17 15:30pm-15:45pm</p>	<p>SENSOR CONFIGURATION IN UBIQUITOUS COMPUTING: CAMERAS VS ONTOLOGIES <i>Hector F Gomez A, Susana A Arias T, Edwin Fabricio Lozada Torres, Victor Molina-Dueñas, Carlos Eduardo Martínez Campaña</i> Universidad Tecnica de Ambato, Ecuador</p> <p>Abstract—The video sequence analysis is a very important topic at the time of using this strategy for surveillance in security places. Semantic representation of the success of the video: person recognition, tracking objects, vehicles, dangerous places, generation of alarms is the principal goal of this work from the storage of the collection of the data obtained by means of IP cameras. We use ontologies t] represent the events-success from IP cameras to identify people in one place, vehicles in the security zone from rules to know what does this event do and trigger the rules at the right time.</p>

SESSION 2

< *Electronic information technology* >

13:15pm-15:45pm | < QA120 >

Session Chair: *Prof. Jung-Min Yang*
Kyungpook National University, Korea

Opening Speech A303

13:15pm-13:30pm

Fault Diagnosis for Composite Asynchronous Sequential Machines with Cascade Composition

Jung-Min Yang

Kyungpook National University, Korea

Abstract—In this paper, we investigate fault diagnosis of composite asynchronous sequential machines with cascade composition. An adversarial input can infiltrate one of two submachines comprising the composite asynchronous machine, causing an unauthorized state transition. The main objective is to specify the condition under which the controller can diagnose any fault occurrence. Two control configurations, state feedback and output feedback, are considered in this paper. In the case of output feedback, the exact estimation of the state of the front machine is impossible since the current state is inaccessible. Due to feature of cascade composition, we must consider the case where the rear submachine undergoes a faulty transition caused by the adversarial input occurring to the front submachine. Fault detectability is also addressed in the case of output feedback.

D15

13:30pm-13:45pm

The Future of CE – from Connected and Smart to... Organized and AI?

Rina Zviel-Girshin and Nathan Rosenberg

Ruppin Academic Center, Israel

Abstract—Consumer electronics industry is a century old, but never in its history was it undergoing such a fundamental change as now. The devices use Information and Communication Technology (ICT) to become connected and smart. The next stage is to use the astonishing advances in Artificial Intelligence (AI) to make the devices intelligent. This digital fourth industrial revolution creates tremendous opportunities but also pitfalls. There is a need for a clear model of the intelligent consumer electronics technology, market and industry. We present here a paradigm of the digital home as organic ecosystem – a hierarchical organization of digital servants modeled after the Victorian manor. Using this paradigm we predict some major developments and new business models and opportunities.

A403-A

13:45pm-14:00pm

Dynamic Modeling and Electromagnetic Simulation of 2-DOF Mechanism

Buhyun Shin, Youngshik Kim

Hanbat National University, Korea

Abstract—The proposed two degree-of-freedom electromagnetic oscillatory actuator has a novel structure to combine two electromagnetic actuators of the moving-coil type. In order to rotate the actuator, the coil is attached to the moving frame, acting as the moving-coil type. There is three magnets, in the middle and inside each moving frame. The direction of the magnetism is perpendicular to the coil in order to change the direction of current induced to the coil and oscillate the moving frame. There are two types of forces applied to the 2-DoF electromagnetic oscillatory actuator. The magnetic force between the magnets holds the moving frame on the left or right side. That magnetic force is called as a holding force. The electromagnetic force generates the oscillatory motion when the current is applied to the coil. The overall size is 15 mm (W) x 15 mm (D) x 50 mm (H). The dynamic modeling and electromagnetic simulations and experiments are conducted. The laser beam profile shows 2-D motion for swing motion for various applications.

A404

A scheme of synchronization calibration between high-speed acquisition boards

Longhui Wang, Guoman Liu, Qian Liu

Beijing Institute of Technology, China

<p>14:00pm-14:15pm</p>	<p>Abstract—In high-speed acquisition system, timing sequence of sampling gate signal and SYNC reset signal may affect synchronization between high-speed acquisition boards (called board synchronization). The problem of board synchronization can be solved by delaying these two signals. In order to ensure board synchronization, a scheme was proposed to estimate reasons for abnormal synchronization according to the difference between boards and calibrated delay parameters of sampling gate signal and SYNC reset signal. When the difference between boards was m sampling points (m is sampling frequency dividing ratio), the abnormal synchronization was caused by sampling gate signal. When the difference between boards was 1 sampling point, the abnormal synchronization was caused by SYNC reset signal. It was effective to adjust the delay parameter of sampling gate signal and the delay parameter of SYNC reset signal to ensure board synchronization. Through test, board synchronization deviation was not more than 20ps. This scheme does not need ergodic calibration of all delay parameters, largely increases efficiency.</p>
<p>D04 14:15pm-14:30pm</p>	<p>Simplified Impedance Design and Control for Low-Cost High-Speed Channels <i>Nansen Chen</i> MediaTek Inc., Taiwan</p> <p>Abstract—Impedance design is the fundamentals of signal integrity at the very beginning, but controlled impedance is always costly or time-consuming for the high-speed channels. In this paper, many simulations of channel parasitics were taken and calculated that met with the specified impedances and correlated to the measurements very well. Selection of the different substrate stack-up without any layout modification in the BGA package reversed from the failed verification to pass the differential return loss. Adjustment of lead widths and spaces in the limited room of leadframe package improved 6Ω of differential-mode impedance compared to the conventional leadframe packages. The differential pairs with wider traces routed on the 2-layer PCB are more robust for over-etching effects whose impedance errors are less than 5% without special impedance control. Moreover, those pairs inserted with a thin ground trace achieved 90Ω differential-mode impedance and 28.2Ω common-mode impedance simultaneously with 35% less routing area for MHL application and reserved a 10Ω series resistor for ESD protection. With those diligent designs, the leadframe package and the 2-layer PCB can be still adopting in the consumer electronics for high-speed applications.</p>
<p>A202 14:30pm-14:45pm</p>	<p>A Novel Substitution Box for Encryption Based on Lorenz Equations Fadia Ali Khan, Jameel Ahmed, <i>Jan Sher Khan</i>, Jawad Ahmad and Muazzam A. Khan Gaziantep University, Turkey</p> <p>Abstract—Complexity of an encryption algorithm is highly dependent on nonlinear components that drive actual security. Only nonlinear component in all traditional encryption algorithms is mainly Substitution Box (S-Box). In block ciphers, the relationship between plaintext and ciphertext is abstruse via confusion operation. Due to the high sensitivity of initial conditions, utilization of chaotic equations in S-Box designing can extensively improve the security and strength of confusion operation. This paper present a novel 8×8 S-Box based on the chaotic properties of Lorenz equation. In order to overcome the transient effects, initial values obtained via Lorenz equation is discarded in the proposed solution. To check the appropriateness of the proposed S-Box in image encryption scenarios, resultant encrypted image pixels from a traditional scheme are further substituted via the proposed S-Box. Standard performances indexes such as correlation coefficient, homogeneity, energy and contrast analyses have been carried out. All experimental results prove that the proposed S-Box essentially improved the security of a traditional image encryption scheme.</p>
<p>A224 14:45pm-15:00pm</p>	<p>Performance Measurements for Full Wave (FWI) Based Multistatic Handheld Ground Penetrating Radar (GPR) for Landmine Detection <i>Suki Dauda Sule</i> and Kevin S. Paulson University of Hull, UK</p>

	<p>Abstract—This paper reports the results of a study to investigate the impact of antenna configuration and rough ground surface on the performance of multistatic handheld ground penetrating radar (GPR) systems for anti-personnel (AP) landmine detection. The work is a follow on to the conclusions presented in [1] which include the fact that enhanced imaging through full wave inversion (FWI) is achieved with multiple receivers in comparison to typical bistatic systems in handheld GPR. This paper seeks to address a couple of aspects of future work outlined in the aforementioned work. Specifically, the study aims to quantitatively characterise the effect of different antenna configurations and rough ground surface on the performance of small multistatic GPR systems used for FWI based sub-surface imaging for demining operations. The 3D electromagnetic (EM) software CST STUDIO SUITE is used to model and simulate the GPR system and singular value decomposition (SVD) analysis is used to estimate parameter sensitivity based on the assumption of prior FWI.</p>
<p>A114 15:00pm-15:15pm</p>	<p>Modeling and Analysis of an Uni-traveling Carrier Hetero-junction Phototransistor HongyunXie, Jiahui Wu, Dan Sun, <i>Xiaoyan Yi</i>, Rui Liu, Shuo Liu, Wanrong Zhang Research and Development Center for Semiconductor Lighting Institute of Semiconductors, China</p> <p>Abstract—In this paper, the equivalent circuit model of UTC-HPT is established to simplify the microwave optical amplifier and mixer design. Based on the equivalent circuit model of HBTs, the photo-generated current in UTC-HPT is introduced reasonably as part of base current. The influence of photo-generated carriers on several equivalent circuit components such as trans-conductance, barrier capacitor, diffusion capacitor and junction resistor are considered carefully in the model. Finally, the collector output current is checked to verify the model validity and the photo-current gain and the photo-characteristic frequency are analyzed with the established model.</p>
<p>A314 15:15pm-15:30pm</p>	<p>A High-performance Branch Predictor Design Considering Memory Capacity Limitations <i>Ha Kyoum Kim</i>, Han Su Kim, Chang Min Eun, Hyun Hak Cho and Ok Hyun Jeong Sogang University, Korea</p> <p>Abstract—Pipeline flush due to the flow change of instruction can be a huge degradation factor in modern processors since the branch instructions consist of more than 20 % of all instructions when running a program. However, with a characteristic called branch locality, the result of branch execution is predictable. By utilizing branch locality, there have been a lot of researches to improve the prediction rate of branch predictor however, most of these did not consider the memory capacity so that they cannot be implemented to the embedded systems. Therefore, we propose a new scheme with high prediction rate while maintaining low memory consumption. The new scheme uses an XOR gate to diversify the Pattern History Table (PHT) index. However, the last 6 bits of the index are replaced with PC addresses to enhance the distinction ability of branch instruction addresses. The simulation was executed using SimpleScalar 3.0 simulator, and benchmarks from SPEC CPU2000. Based on the simulation result, this new structure achieved higher prediction rate while maintaining the low memory consumption. Consequently, the new scheme is the most appropriate branch predictor among comparison group presented in this paper.</p>
<p>A316 15:30pm-15:45pm</p>	<p>Controller and Observer Design for Anti-Angiogenic Tumor Treatment <i>Cagdas Tunceroglu</i>, Ugur HASIRCI Duzce University, Turkey</p> <p>Abstract—This paper concerns design and numerical simulation for anti-angiogenic tumor treatment for the tumors cause women breast cancer. The paper first provides an exact model knowledge controller to drive tumor volume to a desired trajectory, and then explains the design of an observer for the carrying capacity of the vascular network. Lyapunov-like arguments are used to prove the stability of the system. Numerical simulation results are also presented to show the feasibility of the proposed controller and observer.</p> <p>□</p>

SESSION 3

< Communication theory and development technology >

15:45pm-18:45pm | < QA110 >

Session Chair: *Prof. Yanjun Hu,*
Anhui University, China

<p>Opening Speech</p> <p>A208</p> <p>15:45pm-16:00pm</p>	<p>A Whole-Process WiFi Security Perception Software System Heqing Huang, <i>Yanjun Hu</i>, Yan Ja, Shiliang Ao Anhui University, China</p> <p>Abstract—A whole-process WiFi security perception software system is designed in this paper based on the analysis of client’s wireless access process, it consists of three modules to protect user from security threats during the pre-connection, connection and after-connection. The system could detects WiFi environment and shows with 3D effect, marking the Rogue AP, which is found out by multi-factors analysis techniques. During the connection, it inspired by the idea of Fog Computing, sending fake traffic to protect PSK from sniffing. After connection, the system detects Deauth attack in time, and traces the attacker. Finally, The software functionalities is realized, all the suspicious points are displayed on the User Interface (UI). The corresponding experimental testing shows that it could protect the surf in the WiFi environment effectively.</p>
<p>A105</p> <p>16:00pm-16:15pm</p>	<p>Outage Analysis of Two-tier Heterogeneous Cellular Network with Sleep Strategies <i>Amna Shabbir Syed</i>, Hashim Raza Khan, Syed Abbas Ali NED university of Engineering and Technology, Pakistan</p> <p>Abstract—This research paper has analyzed two tier heterogeneous cellular network based infrastructure, when femto cells are introduced in traditional homogeneous network for meeting explosive data rate requirements raised by high speed smart applications driven by smart phones, tablets and PCs. The evolution of small cell opens the possibility to cater with one of the biggest issue in cellular world: Energy Efficiency (EE) of base stations. One way to optimized EE is to introduce sleep mode strategies for small cells. This research work aims to investigate outage probability and active probability of multi-tier heterogeneous network, when sleeping mode strategies are applied for reduction in energy consumption.</p>
<p>A106</p> <p>16:15pm-16:30pm</p>	<p>An Investigation of Energy Efficiency in 5G Wireless Networks <i>Syed Safdar Ali Rizvi</i>, Asif Aziz, Muhammad Taha Jilani, Nasrullah Armi, Ghulam Muhammad, Shujaat H. Butt Bahria University, Karachi, Pakistan</p> <p>Abstract—In next generation wireless networks along with the overwhelming demand of high data rate and network capacity, the user demands ubiquitous connectivity with the network. In order to fulfill the demand of anywhere at any time data services, the network operators have to install more and more base stations that eventually leads towards high power consumption. For this, the potential solution is derived from 5G network that proposes a heterogeneous environment of wireless access networks. More particularly, deployment of Femto and Pico cell under the umbrella of Macro cell base stations (BS). Such networking strategy will result high network capacity and energy efficiency along with better network coverage. In this article, an analysis of energy efficiency has been carried out by using two-tier and three tier network configurations. The simulation results demonstrate that rational deployment of small cells improves the energy efficiency of wireless network.</p>
<p>A206</p> <p>16:30pm-16:45pm</p>	<p>Impact of Connection Type on the Efficiency of Wireless Power Transfer Systems <i>Thabat Thabet</i>, John Woods Essex University, UK</p> <p>Abstract—Analysing a wireless power transfer system is necessary to understand its performance and how different parameters can affect it. The associated analysis can be used</p>

	<p>as a reference to choose the suitable parameters given the constraints in any required design. This paper presents: a theoretical analysis of four topologies of wireless power transfer systems; determines the efficiency and gives the associated experimental measurements. Magnetic resonance coupling theory is used in conjunction with basic circuit analysis in this study. The topologies studied are series-series SS, series-parallel SP, parallel-series PS and parallel-parallel PP connections. Each topology has a different performance for the same combination. This gives a variety from which to choose suitable designs for specific systems with different loads, where the impact of the load on the efficiency also needs to be considered</p>
<p style="text-align: center;">A308 16:45pm-17:00pm</p>	<p>Software-defined Networking-based Cognitive Routing Protocol for Vehicular Ad Hoc Networks <i>Huma Ghaffoor</i> and Insoo Koo University of Ulsan, Korea</p> <p>Abstract—Cognitive routing for software-defined vehicular networks is proposed in this paper to find a stable path between source and destination. The protocol has two phases: registering phase and route prediction phase. The main controller is responsible for global view of the network whereas several local controllers are defined to reduce the burden of main controller by keeping a localized global view of the network. Local controllers are selected in the registering phase. Once all the local controllers are selected, the protocol switches to route prediction phase. With the aid of main controller and local controllers, the proposed algorithm aims to reduce end-to end delay by selecting the best route which maximizes the path duration. A route is established by selecting both channel and relay simultaneously for each link, thereby making a stable path between source and destination. Two vehicles can only form a link if they both have consensus on common idle channel. Therefore, spectrum sensing is the primary task of this algorithm to find a stable route by keeping licensed users safe. We apply belief propagation (BP) algorithm to compute a final belief about existence of primary user (PU). Our simulation results report a significant improvement in end-to-end delay.</p>
<p style="text-align: center;">A402 17:00pm-17:15pm</p>	<p>DC biased input stage with differential photocurrent sensing for VLC front-ends <i>MAJED BASHA, RICHARD BINNS</i> University of Northumbria, UK</p> <p>Abstract—The reverse bias voltage across the PIN photodiode is essential for the photodiode to operate in the photoconductive mode. This paper presents an input bias stage with differential photocurrent sensing for VLC front-ends. The bias voltage is provided from within the transimpedance amplifier's (TIA) circuit eliminating the need of external bias voltage. The amount of bias voltage could be optimised according to the photodiode required sensitivity and capacitance. The differential configuration makes the TIA immune to any common mode noise. The proposed method is applied to a hypothetical TIA and results are compared with single ended structure. Simulation results showed that using this approach it is possible to achieve a transimpedance gain of 120 dBΩ over a maximum bandwidth of 14.5 MHz with a common mode rejection ratio of 61 dB while the circuit provides a controlled bias voltage of up to 6 V across the PIN photodiode eliminating the need for external bias voltage source.</p>
<p style="text-align: center;">A212 17:15pm-17:30pm</p>	<p>Realistic Estimation of Power Penalty through a Probabilistic Framework in a WDM Receiver with Component Crosstalk <i>Santu Sarkar</i>, Pinak Pani Mukherjee and Nikhil R. Das Calcutta University, India</p> <p>Abstract—In this work, the performance degradation in a Wavelength Division Multiplexing (WDM) receiver system is analyzed in terms of power penalty considering the presence of multiple component crosstalk sources. In conventional way, power penalty is calculated considering the presence of all crosstalk sources simultaneously (i.e. worst case) which is not reality in practice and leads to unrealistic estimation. Here a probabilistic approach is adopted which considers all possible probabilistic appearances of the interfering channels and their realistic impact while calculating Bit Error Rate (BER) and penalty. Power penalty</p>

	<p>considering the presence of signal-crosstalk beat noise is formulated and the effect of the variation of number of interfering channels and crosstalk level are studied for a fixed thermal noise and photocurrent setting of the receiver. In addition the obtained results are compared with the existing worst case analysis model.</p>
<p>A306 17:30pm-17:45pm</p>	<p>A Method of Multi-Channel Pulse Acquisition Synchronization <i>Zhanyang Ai</i>, Longhui Wang, Guoman Liu, Chengfa Xu Beijing Institute of Technology, China</p> <p>Abstract—In multi-channel pulse acquisition system, it needs to ensure two kinds of synchronization. One is channel synchronization, the other is pulse synchronization. In order to ensure the two synchronizations, a method was proposed by using ADC reset signal to control ADC start-up simultaneously and sequential logic of internal sampling clock fixed. Through the analysis of multi-channel pulse acquisition system architecture, ADC start-up simultaneously could ensure channel synchronization. By the analysis of sequential logic, fixed phase of internal sampling clock could ensure pulse synchronization. Through experiments, channel synchronization deviation is less than 2ps and pulse synchronization deviation is less than 5ps.</p>
<p>A313 17:45pm-18:00pm</p>	<p>A 28mW 320MHz 3rd-order Continuous-Time Time-Interleaved Delta-Sigma Modulator with 10MHz Bandwidth and 12 Bits of Resolution <i>Jafar Talebzadeh</i> and Izzet Kale University of Westminster London, UK</p> <p>Abstract—This paper presents a 3rd-order two-path Continuous-Time Time-Interleaved (CTTI) delta-sigma modulator which is implemented in standard 90nm CMOS technology. The architecture uses a novel method to solve the delayless feedback path issue arising from the sharing of integrators between paths. The clock frequency of the modulator is 320MHz but integrators, quantizers and DACs operate at 160MHz. The modulator achieves a dynamic range of 12 bits over a bandwidth of 10MHz and dissipates only 28mW of power from a 1.8-V supply.</p>
<p>A315 18:00pm-18:15pm</p>	<p>Two KASUMI Components for an Optimal Implementation of the A5/3 Algorithm <i>Mahdi Madani</i>, Salim Chitroub, and Camel Tanougast LISIC, University of Science and Technology of Houari Boumedienne, Algeria</p> <p>Abstract—The mobile phone is widely used in our daily lives, and thus the need for securing communications and data has become essential. For that purpose, cryptography was used to provide security services for the subscribers of mobile phones. The series of the encryption algorithms of A5/x is used to ensure the confidentiality of conversations on mobile phones in most countries that used the GSM network. In this paper, we propose a new hardware implementation of A5/3 algorithm by using two KASUMI components. The purpose is to provide a better efficiency, in terms of computation time and of safety as well, for the algorithm A5/3.</p>
<p>A104 18:15pm-18:30pm</p>	<p>Early Stopping Criterion for LDPC Codes <i>Janak Sodha</i> University of the West Indies, Barbados</p> <p>Abstract—A log-likelihood ratio (LLR) test on the single check node of an LDPC decoder is utilised to develop an improved low complexity stopping criterion. The average number of iterations required at low SNRs is significantly reduced without sacrificing the BER performance. At high SNRs, unlike typical stopping criteria which suffer a penalty in the BER performance because the decoder inadvertently stops the decoder too early, the proposed algorithm adaptively switches off at high SNRs. Simulation results are presented for the rate (288, 576) WiMAX 802.16e LDPC code digits using binary phase shift keying (BPSK) over an AWGN channel.</p>
<p>A304</p>	<p>Voice Trigger System using Fuzzy Logic <i>Erez Manor</i> and Shlomo Greenberg</p>

18:30pm-18:45pm	Ben-Gurion University, Israel Abstract—In this paper, we propose a voice trigger system using a keyword-dependent speaker recognition technique. The voice trigger system must be able to perform keyword recognition, as well as speaker recognition, without using computationally demanding speech recognizer, to properly trigger a mobile device with low computational power consumption. This paper presents a fuzzy logic system to classify the speaker voice features. Experiments using a Hebrew word bank show that the fuzzy based method performs with low recognition error while highly minimizing the power and area footprint comparing to conventional methods.
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SESSION 4

< Power electronics and equipment development >

15:45pm-19:00pm | < QA120 >

Session Chair: *Dr. Branislav Vuksanovic, University of Portsmouth, UK*
Dr. Jau-Jr Lin, National Changhua University of Education, Taiwan

Opening Speech

A311

15:45pm-16:00pm

Load Forecasting via Detrending and Deseasoning
Branislav Vuksanovic, Pedro Martin
University of Portsmouth, UK

Abstract—Load forecasting is a term usually applied to describe a process of estimation or prediction of future energy demand for a certain distribution grid or part of a grid. Large numbers of different methods and techniques used for load forecasting have been developed in the past and new and improved methods are regularly being reported in research literature. This paper describes one of traditional load forecasting approaches based on autoregressive moving average (ARMA) modelling of load demand time-series (TS). However, it reconsiders each step in this process and proposes some new procedures to improve and clarify the whole method. Effectives of described approach are demonstrated using energy consumption measurements recently recorded at substations in central London area.

A309

16:00pm-16:15pm

A Monolithic Isolated Gate Driver using an On-chip Transformer and a Voltage Level Shifter
Kai-Chieh Lin and *Jau-Jr Lin*
National Changhua University of Education, Taiwan

Abstract—This paper proposes a monolithic isolated gate driver design with a voltage level shifter. Incorporating voltage level converters can effectively reduce input drive voltage requirements and the overall energy needed to the power gate drivers. The on-chip transformer detailed in this study consists of a pair of on-chip inductors. Two types of the on-chip transformer structures are used: a stacked transformer (featuring higher coupling coefficient) and a tapped transformer (featuring higher voltage isolation). The on-chip transformer, full-bridge rectifier, gate driver, and voltage level converter were all produced using the TSMC 0.25- μm HV (high-voltage) CMOS process. Compared to the findings of the previous study, simulations conducted in this study showed that the proposed monolithic isolated gate driver with a voltage level shifter required a 62% lower power input voltage and 34% less power consumption. Moreover, it could provide 12 V of output voltage and drive a load of 6000 pF with the rise and fall time less than 1 μs .

□

A216

16:15pm-16:30pm

The Design of Optimal Phase Tracking Current Controlled Attenuators
Anneke Stofberg, PW van der Walt, JB de Swardt
Stellenbosch University, South Africa

Abstract—Multi-channel receivers often require good phase tracking between channels. If a PIN diode current controlled attenuator (CCA) is needed in each channel, the individual CCAs should track in phase over the full control range. Variations in PIN diode complex impedance as well as component tolerances will cause phase tracking errors in a family of CCAs. A method to compare CCA topologies in terms of phase tracking performance is developed. By using sensitivity analysis and defining a single root sum square measure for comparing attenuator topologies, an optimum topology is identified for implementing an electronically controlled variable attenuator. The results clearly show that the cascade parallel quarter-wave attenuator topology will have the smallest phase tracking error within a family of CCAs.

<p style="text-align: center;">A222 16:30pm-16:45pm</p>	<p>Efficiency Improvement of Dual Mode DC-DC Buck Converter under Light Load Using PTWS with a Zero Current Detector <i>Young-Ho Shin</i>, Hak-Yun Kim, Jin-Won Kim, Seong-Yeol Choi, Yeong-Seuk Kim and Ho-Yong Choi Chungbuk National University, Korea</p> <p>Abstract—This paper presents a dual-mode DC-DC buck converter using power transistor width scaling (PTWS) with a zero current detector to improve power efficiency under light load. The buck converter is operated in a dual mode, combining the switching frequency modulation (SFM) mode which uses the voltage controlled oscillator (VCO) under light load, with the PWM mode for heavy load. To enhance power efficiency under light load a PTWS scheme is employed, in which the inductor current is detected using a zero current detector (ZCD) and then used to select the gate size of the power switching transistor. The proposed circuit was designed using a Magnachip 0.35 results shows that our proposed converter has 81.3% ~ 93% power efficiency for output load currents of 10mA ~ 250mA, which is a 5.3% improvement compared to a simple SFM-PWM dual mode and an 8.9% improvement compared to a PWM-only mode under a light load of 10mA, respectively.</p>
<p style="text-align: center;">A210 16:45pm-17:00pm</p>	<p>Low Dropout Regulator with Temperature Coefficient Curvature Correction Topology <i>Nardi Utomo</i>, Siek Liter Nanyang Technological University, Singapore</p> <p>Abstract—The LDO Voltage Regulator circuit with temperature coefficient curvature correction topology is proposed in this paper. The LDO consists of a start-up circuit, a bias generator, a three-stage error amplifier, a power MOSFET, and a temperature coefficient curvature correction circuit. The circuit is simulated with 0.18μm CMOS Technology. The supply voltage can be as low as 800mV with the output voltage of 664mV. The proposed circuit obtains the temperature coefficient as low as 23.7ppm/oC for supply voltage ranging from 800mV until 1.5V. The lowest temperature coefficient of 6.1ppm/oC is obtained at 1.1V supply voltage. The temperature coefficient is measured for a wide range of temperature ranging from -50oC to 130oC. The stability is ensured from the simulation with high low-frequency open loop gain of above 105dB and high phase margin of above 100o.</p>
<p style="text-align: center;">D05 17:00pm-17:15pm</p>	<p>Forecasting Hourly Electricity Demand Using a Hybrid Method Hasan Hüseyin Çevik, Hüseyin Harmancı, and <i>Mehmet Çunkas</i> Selçuk University, Turkey</p> <p>Abstract—In the electricity sector, new sides have emerged with the development of technology and the increasing the electric energy need. Today, electricity has become a product that is bought and sold in the market environment. Forecasting which is the first step of plans and planning have become much more important and have been made mandatory for the market participants by energy market regulators. In this study, a short-term electricity load forecast is done for 24 hours of next day. Artificial Neural Network (ANN) and Particle Swarm Optimization (PSO) techniques are used for the forecast method in a hybrid form. The weights of ANN is updated by PSO in learning phase. Historical load consumption data, historical daily mean air temperature data and season are selected as inputs. Load data of 4 years on hourly basis are taken into account. Train and test data are considered as 3 years and 1 year, respectively. The MAPE error is found as 2.15 for one year period on an hourly basis.</p>
<p style="text-align: center;">D07 17:15pm-17:30pm</p>	<p>Harmonic Elimination for PWM Inverter Bo-Han Wang, Ruei-Yu Huang and <i>An-Chen Lee</i> National Chaio Tung University, Taiwan</p> <p>Abstract—For a PWM inverter system, the output ac current is expected to be a sinusoidal waveform after filtering; however, PWM inverters have two drawbacks causing distortion of output waveform. One is the presence of harmonics, and the other is the variations of the system parameters. In this paper, a robust Doubly Coprime Factorization Disturbance Observer (robust DCFDOB) is applied to a dc-to-ac inverter. The proposed robust</p>

	<p>DCFDOB involves the H^∞-loop shaping method to guarantee the robust stability and robust performance. Experiment results are given to illustrate the effectiveness of the robust DCFDOB.</p>
<p>D301 17:30pm-17:45pm</p>	<p>Determination of the temperature in the half-voltage disconnect switches, through polynomial functions obtained from thermographic images, for the development of intelligent maintenance systems <i>Ernesto Abril Chafra</i>, Ernesto Abril Garcés, Armando Álvarez Salazar and José Armingol Moreno UNIVERSIDAD TÉCNICA DE COTOPAXI, ECUADOR</p> <p>Abstract—In the present investigation the images with the minimum pixelation required for the inspections of maintenance inside the electrical substation are indicated. In addition, three polynomial functions are obtained based on the heat radiation of the half-voltage disconnecting switches, since these contain the highest temperature values in the images captured in a range between -3 and 39 degrees Celsius. The functions found establish a mathematical relationship between grayscale pixelation and temperature of the images taken at the electrical substation. Each of the obtained functions are tested, applying the relation on the pixelation of different images in JPEG format and obtaining the average quadratic error. So these functions can be applied in the development of computer vision systems focused on the maintenance area of electrical and mechanical equipment and devices.</p>
<p>D401 17:45pm-18:00pm</p>	<p>An Experimental Study on the Effects of Bioethanolgasoline Blends on Engine Performance in a Spark Ignition Engine <i>Hasan AYDOGAN</i>, A. Engin OZCELIK, and Mustafa ACAROGLU Sencuk University, Turkey</p> <p>Abstract—Bioethanol is a renewable fuel that can be produced through different methods of agricultural fermentation. In the present study, the effects of bioethanol-unleaded gasoline blends on engine performance were investigated in a spark ignition engine. Unleaded gasoline and unleaded gasoline-bioethanol blends containing 50% and 100% by volume bioethanol respectively were tested in the engine and the test results were compared. The results of the study showed that the use of unleaded gasoline as fuel yielded better engine performance. However, regarding engine torque and power, the use of bioethanol-unleaded gasoline blends caused decreases at rates of up to 15% in the amount of torque and power. Specific fuel consumption is increased.</p>
<p>A108 18:00pm-18:15pm</p>	<p>Simulation and Modeling of Charging and Discharging of Supercapacitors <i>Sheryl Dinglasan Fenol</i>, Felicito S. Caluyo, Jhunlyn J. Lorenzo IEEE / MAPUA INSTITUTE OF TECHNOLOGY, PHILIPPINES</p> <p>Abstract—Supercapacitors is the new technology that can be used to replace the battery or in parallel with battery with its fast charge– discharge characteristics. Possible applications of supercapacitors are in renewable energy as sustainable energy storage and hybrid electric vehicle (HEV). This study focus on charging and discharging of supercapacitors and its behavior. Mathematical models of charging and discharging with the proposed equivalent circuits were simulated and compared with actual experiment simulation using potentiostat. The equation for approximated full discharge time of supercapacitors was also presented. Two commercially available supercapacitors with 4.7F and 3.3F capacitance and 2.5V were set-up in potentiostat using two-electrode mode.</p>
<p>A305 18:15pm-18:30pm</p>	<p>Intelligent Management and Control of Received Wireless Power <i>Thabat Thabet</i>, John Woods Essex University, UK</p> <p>Abstract—The concept of powering a remote device without wires is known as a wireless power transfer system. Some applications employ batteries while others use storage capacitors instead. In either case, it is necessary to transfer enough power to enable the receiver to do the required work. This paper presents an intelligent algorithm to manage</p>

	<p>received wireless power to do useful work even though there is insufficient power to do the work directly. The example ultra-low power microcontroller discussed here is the ATTiny85 although the approach is applicable to a whole family of similar micros. The algorithm used makes intelligent decisions whether to sleep or wake according to the amount of received and stored energy. Using an adaptive strategy of this kind the amount of work can be precisely matched to the resources available to achieve maximum utilization. The paper also evaluates the performance of the proposed algorithm compared with more conventional ways of doing the same thing.</p>
<p>A111 18:30pm-18:45pm</p>	<p>Electric Field Aided Optical Gain in Semiconductor Quantum Dots <i>Shampa Guin</i>, Nikhil Ranjan Das Calcutta University, India</p> <p>Abstract—In this paper, the effect of external electric field on the absorption coefficient, emission coefficient and material gain of Quantum Dot ensemble are studied using Fermi's golden rule and considering the Gaussian distribution of density of state due to the deviation of the dot size. The study shows that the electric field causes red-shift in optical transition as well as enhanced optical gain.</p>
<p>D402 18:45pm-19:00pm</p>	<p>A Model of Thai Consumers' Behavioral Intention: A Study of Generations X and Y <i>Vinai Panjakajornsak</i> King Mongkut's Institute of Technology Ladkrabang, Thailand</p> <p>Abstract— The purpose of this study is to develop and examine the relationships of factors affecting the behavioral intentions of Thai consumers to buy goods and services on mobile devices, such as smartphones and tablets in two generational cohorts, Generation X and Generation Y. Despite the increased adoption of smartphones and tablets to access internet and perform various activities, no empirical research in Thailand has been found to study consumer behavior on mobile marketing and shopping or any specific generations. Based on relevant past research, this research fills this gap by developing a structural model to investigate and test hypotheses developed for this study. The samples were Thai people who used to make online purchases on the internet in the past year. The research instruments used to collect primary data were self-reported questionnaires. The collected data will be tested for reliability and validity using confirmatory factor analysis (CFA) and the structural model will be confirmed by structural equation modeling (SEM).</p>

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Presentation Quick Review

Oral Presentation

SESSION 1

July 15, 2017/13:15pm-15:45pm
< QA110 >
PP. 15-18

A307-A	Architecture and Technology of the Simulation System for Intelligent Unmanned Air Vehicles
A215-A	A Study of the Emerging Role of Information Technology in Autonomous Car
A220-A	Evacuation dynamics considering the impact of communication and memory of pedestrian via an extended cellular automaton model
A223	Thermal Dynamics Modeling and Simulation of a Heating System for a Multi-Zone Office Building Equipped with Demand Controlled Ventilation Using MATLAB/Simulink
A310	A Robust Detection Algorithm for Image Copy-Move Forgery in Smooth Regions
A408	Real-Time Benchmark Set Synthesis Based on pWCET Estimation and Bounded Hyper-Periods
D01-A	Electrochemical properties of ZnO coated LiNi _{0.8} Co _{0.15} Al _{0.05} O ₂ cathode for lithium secondary battery
D08	Consumer Electronics May Deliver More Than Consumer Applications: Being as Social Problem Solver and CRM Promotor
D10	User Experience on XD Theatre: Body Gestures and Postures of Deaf and Normal Children
D17	SENSOR CONFIGURATION IN UBIQUITOUS COMPUTING: CAMERAS VS ONTOLOGIES

SESSION 2

July 15, 2017/13:15pm-15:45pm
< QA120 >
PP. 19-21

A303	Fault Diagnosis for Composite Asynchronous Sequential Machines with Cascade Composition
D15	The Future of CE – from Connected and Smart to... Organized and AI?
A403-A	Dynamic Modeling and Electromagnetic Simulation of 2-DOF Mechanism
A404	A scheme of synchronization calibration between high-speed acquisition boards
D04	Simplified Impedance Design and Control for Low-Cost High-Speed Channels
A202	A Novel Substitution Box for Encryption Based on Lorenz Equations
A224	Performance Measurements for Full Wave (FWI) Based Multistatic Handheld Ground Penetrating Radar (GPR) for Landmine Detection
A114	Modeling and Analysis of an Uni-traveling Carrier Hetero-junction Phototransistor
A314	A High-performance Branch Predictor Design Considering Memory Capacity Limitations
A316	Controller and Observer Design for Anti-Angiogenic Tumor Treatment

SESSION 3
July 15, 2017/15:45pm-18:45pm
< QA110 >
PP. 22-25

A208	A Whole-Process WiFi Security Perception Software System
A105	Outage Analysis of Two-tier Heterogeneous Cellular Network with Sleep Strategies
A106	An Investigation of Energy Efficiency in 5G Wireless Networks
A206	Impact of Connection Type on the Efficiency of Wireless Power Transfer Systems
A308	Software-defined Networking-based Cognitive Routing Protocol for Vehicular Ad Hoc Networks
A402	DC biased input stage with differential photocurrent sensing for VLC front-ends
A212	Realistic Estimation of Power Penalty through a Probabilistic Framework in a WDM Receiver with Component Crosstalk
A306	A Method of Multi-Channel Pulse Acquisition Synchronization
A313	A 28mW 320MHz 3rd-order Continuous-Time Time-Interleaved Delta-Sigma Modulator with 10MHz Bandwidth and 12 Bits of Resolution
A315	Two KASUMI Components for an Optimal Implementation of the A5/3 Algorithm
A104	Early Stopping Criterion for LDPC Codes
A304	Voice Trigger System using Fuzzy Logic

SESSION 4
July 15, 2017/15:45pm-19:00pm
< QA120 >
PP. 26-29

A311	Load Forecasting via Detrending and Deseasoning
A309	A Monolithic Isolated Gate Driver using an On-chip Transformer and a Voltage Level Shifter
A216	The Design of Optimal Phase Tracking Current Controlled Attenuators
A222	Efficiency Improvement of Dual Mode DC-DC Buck Converter under Light Load Using PTWS with a Zero Current Detector
A210	Low Dropout Regulator with Temperature Coefficient Curvature Correction Topology
D05	Forecasting Hourly Electricity Demand Using a Hybrid Method
D07	Harmonic Elimination for PWM Inverter
D301	Determination of the temperature in the half-voltage disconnect switches, through polynomial functions obtained from thermographic images, for the development of intelligent maintenance systems
D401	An Experimental Study on the Effects of Bioethanolgasoline Blends on Engine Performance
A108	Simulation and Modeling of Charging and Discharging of Supercapacitors
A305	Intelligent Management and Control of Received Wireless Power
A111	Electric Field Aided Optical Gain in Semiconductor Quantum Dots
D402	A Model of Thai Consumers' Behavioral Intention: A Study of Generations X and Y

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- 4 King William Court**
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- 7 Dreadnought Building**
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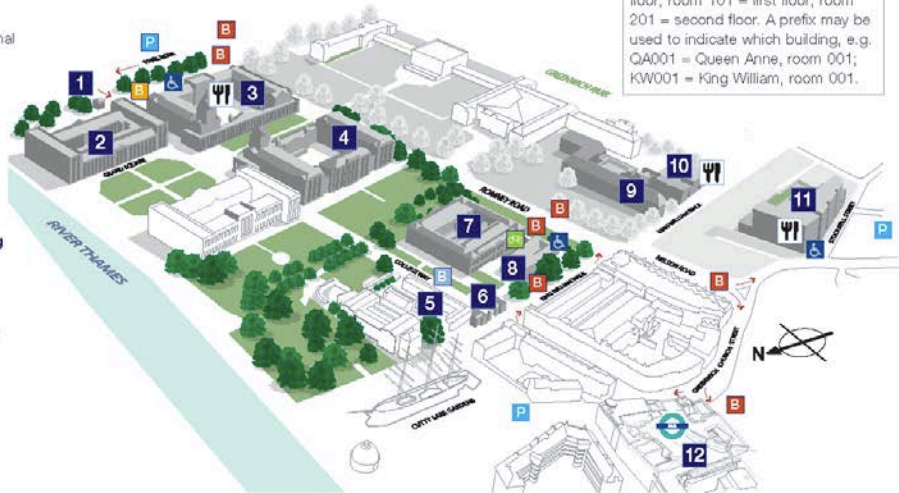
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For a list of departments belonging to these faculties, please see page 22.

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Plenary Speakers

Prof. Dr. Ruslan V. Sharapov, Murom Institute of Vladimir State University, Russia

Dr. Mattia De Rosa, Queen's University Belfast, UK

Program at a glance:

December 2, 2017

All about registration

December 3, 2017

Registration

Opening Ceremony + Keynote Session

Technical Sessions

December 4, 2017

One day tour in St. Petersburg

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