2018 29th Irish Signals and Systems Conference (ISSC 2018)

Belfast, United Kingdom
21 – 22 June 2018

Additional Copies of This Publication Are Available From:

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

CURRAN ASSOCIATES INC.
proceedings
.com

Conference Program

Thursday 21 June		
0830	Registration	Foyer
0915	Welcome	01.005
0930	**KN-1 Algebraic and Optimization Techniques for Cyber-Physical Systems** Prof. Raphaël Jungers (University of Louvain)	01.005
1015	Coffee Break	Foyer

1030	**Th1a Machine Learning**	**02.014**
10:30	**Mel Frequency Cepstral Coefficients Enhance Imagined Speech Decoding Accuracy from EEG...1** Ciaran Cooney (Ulster University), Rafaella Folli (Ulster University), Damien Coyle (Ulster University)	
10:50	**Deep Learning for Visual Navigation of Un.3manned Ground Vehicles; A review...7** Niall O' Mahony (Institute of Technology Tralee), Sean Campbell (Institute of Technology Tralee), Lenka Krpalkova (Institute of Technology Tralee), Aidan Murphy (University of Limerick), Conor Ryan (University of Limerick), Daniel Riordan (Institute of Technology Tralee), Joseph Walsh (Institute of Technology Tralee)	
11:10	**Evaluating Extended Pruning on Object Detection Neural Networks...13** Simon O'Keeffe (Maynooth University), Rudi Villing (Maynooth University)	
11:30	**A Machine Vision Approach to Human Activity Recognition using Photoplethysmograph Sensor Data...19** Eoin Brophy (Department of Electronic Engineering, Maynooth University), Jose Juan Dominguez Veiga (Insight Centre for Data Analytics, Dublin City University), Zhengwei Wang (Insight Centre for Data Analytics, Dublin City University), Tomas Ward (Insight Centre for Data Analytics, Dublin City University)	

1030	**Th1b Cybersecurity I**	**02.016**
10:30	**Getting Prepared for the Next Botnet Attack: Detecting Algorithmically Generated Domains in Botnet Command and Control...25** Tim kelley (Letterkenny Institute of Technology), Eoghan Furey (Letterkenny Institute of Technology)	
10:50	**Machine Learning for Real-Time Data-Driven Security Practices...31** Shane Coleman (Institute of Technology Tralee), Pat Doody (Institute of Technology Tralee), Andrew Shields (Institute of Technology Tralee)	
11:10	**Micro-Benchmarking Property Preserving Encryption: Balancing Performance, Security and Functionality...37** Daniel Becker (University College Dublin), Andrew Hines (University College Dublin)	
11:30	**Access Control Policy Enforcement for Zero-Trust-Networking...43** Romans Vanickis (Athlone IT), Paul Jacob (Athlone IT), Sohelia Deghanzadeh (Athlone IT), Brian Lee (Athlone IT)	

ISSC 2018

Thursday 21 June	
1150	**KN-2 Deep Learning with MATLAB :** **Real-time Object Recognition and Transfer Learning** Dr. Coorous Mohtadi (Mathworks) 01.005
1230	Lunch Foyer

1330	**Th2a Circuits & Sytems I** **02.014**
13:30	**Effect of Parasitics and Process Variations in Buck Converters Operated in Voltage-Mode...49** Pasquale Napolitano (On Semiconductor Ireland Ltd.), Marian Poncik (On Semiconductor Ireland Ltd.), Andrea Bonelli (On Semiconductor Ireland Ltd.)
13:50	**N-way Digitally Driven Doherty Power Amplifer Design and Analysis for Ku band applications...55** Sidath Madhuwantha (National University of Ireland Maynooth), Prasidh Ramabadran (National University of Ireland Maynooth), Ronan Farrell (National University of Ireland Maynooth), John Dooley (National University of Ireland Maynooth)
14:10	**Behavioural Models for Distributed Arrays of High Performance Doherty Power Amplifiers...61** Sidath Madhuwantha (National University of Ireland Maynooth)

1330	**Th2b Cybersecurity II** **02.016**
13:30	**A Performance Comparison of the PRESENT Lightweight Cryptography Algorithm on Different Hardware Platforms...67** Daniel Irwin (Dublin City University), Pengcheng Liu (Dublin City University), Saqib Chaudhry (Dublin City University), Martin Collier (Dublin City University), Xiaojun Wang (Dublin City University)
13:50	**She Knows Too Much – Voice Command Devices and Privacy...72** Eoghan Furey (Letterkenny Institute of Technology), Juanita Blue (Ulster University)
14:10	**Reducing the intrusion of user-trained activity recognition systems...78** William Duffy (Ulster University), Kevin Curran (Ulster University), Daniel Kelly (Ulster University), Tom Lunney (Ulster University)
14:30	**Bayesi-Chain: Intelligent Identity Authentication...82** Juanita Blue (University of Ulster), Joan Condell (University of Ulster), Tom Lunney (University of Ulster), Eoghan Furey (Letterkenny Institute of Technology)

Thursday 21 June

1450 Poster Session	Foyer

A BJT BiCMOS Temperature Sensor with a Two-Point Calibrated Inaccuracy of 0.1°C (3σ) from -40 to 125°C...88
Gabriel Banarie (Analog Devices International), Declan Mcdonagh (Analog Devices International), Viorel Bucur (Analog Devices International), Stefan Marinca (University Politehnica of Bucharest), Mircea Bodea (University Politehnica of Bucharest)

An Extended Kalman Filter based parametric identification for a tire balancer system...91
Rodrigo Trentini (Federal Institute of Santa Catarina)

Image Embedded Enconding using Set Partitioning in Hierarchical Tree - SPIHT...95
Eduardo Gerlein (Pontificia Universidad Javeriana), Paula Beltrán (Pontificia Universidad Javeriana), Nestor Cabrera (Pontificia Universidad Javeriana), Juan Romero (Pontificia Universidad Javeriana)

Towards a Prevention Security Oriented Mindset in Managing Optical Networks...101
Kenza Gaizi (University Sidi Mohammed Ben Abdellah, Faculty of Science and Engineering - Al Akhawayn University Ifrane), Farid Abdi (University Sidi Mohammed Ben Abdellah), Fouad Mohammed Abbou (Al Akhawayn University Ifrane)

Visual Servo Control of a Micro Quad-copter as a Teaching Platform for Engineering...108
Rodrigo Pessoa (Trinity College Dublin), William Barbosa (Pontifical Catholic University of Rio de Janeiro), James Mc Loughlin (Trinity College Dublin), Anil Kokaram (Trinity College Dublin)

Swarm Intelligence for IoT...N/A
Sabine Radomski (University of Applied Sciences Leipzig), Aiman Qais (University of Applied Sciences Leipzig), Andreas Roos (Telekom)

A Comparative Study of Chisel for FPGA Design...114
Paul Lennon (IT Tallaght), Richard Gahan (IT Tallaght)

Test methodology for measuring resistance and capacitance leakage current in Integrated Compensators Intended for Automotive Applications...120
Stephen Ogunniran (On Semiconductor Ireland Ltd.), Tallita Sobral (On Semiconductor Ireland Ltd.), Pasquale Napolitano (On Semiconductor Ireland Ltd.), Ihsan Albittar (On Semiconductor Ireland Ltd.)

Investigation and Implementation of Robust Wireless Zigbee Based Security System...124
Vladyslav Romashchenko (Anhalt University of Applied Sciences), Michael Brutscheck (Anhalt University of Applied Sciences), Ingo Chmielewski (Anhalt University of Applied Sciences)

A low-cost, open-source, BCI-VR prototype for real-time signal processing of EEG to manipulate 3D VR objects as a form of neurofeedback...130
Michael McMahon (Discipline of Information Technology, National University of Ireland Galway), Michael Schukat (Discipline of Information Technology, National University of Ireland Galway)

ISSC 2018

1450   Poster Session continued   Foyer

Sensor Technology in Autonomous Vehicles - A Review...136

Sean Campbell (Institute of Technology Tralee), Niall O' Mahony (Institute of Technology Tralee), Lenka Krpalkova (IT TRALEE,LERO), Daniel Riordan (Institute of Technology Tralee), Joseph Walsh (Institute of Technology Tralee), Aidan Murphy (University of Limerick), Conor Ryan (University of Limerick)

An L-shaped frequency reconfigurable MIMO Dielectric Resonator antenna for PCS band applications...140

Shahid khan (Laboratoire-de-conception-optimisation-et-modélisation-des-systèmes. University de Lorraine, Metz, France), Hazrat Ali (Department of Electrical Engineering, COMSATS University Islamabad, Abbottabad Campus), Rizwan khan (Advanced Communication Engineering Center of Excellence, School of Computer and Communication Engineering, Universiti Malaysia Perlis, Malaysia), Ramenah Harry (Laboratoire-de-conception-optimisation-et-modélisation-des-systèmes. University de Lorraine, Metz, France), Camel Tanougast (Laboratoire-de-conception-optimisation-et-modélisation-des-systèmes. University de Lorraine, Metz, France)

A cross-shaped MIMO reconfigurable dielectric resonator antenna for GSM and LTE/UMTS applications...145

Shahid khan (Laboratoire-de-conception-optimisation-et-modélisation-des-systèmes. University de Lorraine, Metz, France), Hazrat Ali (Department of Electrical Engineering, COMSATS University Islamabad, Abbottabad Campus), Rizwan khan (Advanced Communication Engineering Center of Excellence, School of Computer and Communication Engineering, Universiti Malaysia Perlis, Malaysia), Ramenah Harry (Laboratoire-de-conception-optimisation-et-modélisation-des-systèmes. University de Lorraine, Metz, France), Camel Tanougast (Laboratoire-de-conception-optimisation-et-modélisation-des-systèmes. University de Lorraine, Metz, France)

ICCapt: Online design capture and HDL generation, with PYNQ SoC prototyping in the cloud...149

Aidan Boyd (National University of Ireland, Galway), Frank Callaly (National University of Galway), Dáire Canavan (National University of Galway), Declan O'loughlin (National University of Galway), Jeremy Audiger (National University of Galway), Yohan Boyer (National University of Galway), Niall Timlin-canning (National University of Galway), László Bakó (Sapientia Hungarian University of Transylvania, Tîrgu Mureş, Romania), Szabolcs Hajdú (Sapientia Hungarian University of Transylvania, Tîrgu Mureş, Romania), Fearghal Morgan (National University of Ireland, Galway)

Modeling Power Supply Rejection in Analog Systems...155

Ihsan Albittar (On Semiconductor Ireland Ltd.), Pasquale Napolitano (On Semiconductor Ireland Ltd.), Tallita Sobral (On Semiconductor Ireland Ltd.), Stephen O'Gunniran (On Semiconductor Ireland Ltd.)

1550   KN-3 Communication Systems to Combat Emergency and Disaster Scenarios - A 5G use case

Prof. Muhammad Imran (University of Glasgow)   01.005

Conference Program

Thursday 21 June		

1635 — Th3a Circuits & Systems II — 02.014

16:35 Novel first order Digital Differentiator for Analog-to-Digital Transform...158
Tahar Bensouici (Département de Télécommunication, Faculté d'Electronique et Informatique, Université USTHB), Abdelfatah Charef (Laboratoire de Traitement du Signal Département d'Electronique Université des Frères Mentouri Constantine), Imen Assadi (Laboratoire de Traitement du Signal Département d'Electronique Université des Frères Mentouri Constantine)

16:55 Switched Capacitor Charge Pump Voltage-Controlled Current Source...163
Luca Avallone (University College Dublin), Ettore Napoli (University of Naples - Federico II), Peter Kennedy (University College Dublin)

17:15 Resistance-based Calibration of a Double Bias Elimination Resistance Measurement Circuit...169
Ciarán Doyle (Institute of Technology Tralee), Daniel Riordan (Institute of Technology Tralee), Joseph Walsh (Institute of Technology Tralee)

1635 — Th3b DSP & Hardware — 02.016

16:35 Power analysis of sorting algorithms on FPGA using OpenCL...174
Aidan O Mahony (University College Cork), Emanuel Popovici (University College Cork)

16:55 Audio DSP remote hardware prototyping and console creation...180
Dáire Canavan (National University of Ireland, Galway), Declan O'loughlin (National University of Galway), Frank Callaly (National University of Galway), Aidan Boyd (National University of Ireland, Galway), Jeremy Audiger (National University of Galway), Yohan Boyer (National University of Galway), Joan Espanol (National University of Ireland, Galway), Marion Bertrand (National University of Galway), László Bakó (Sapientia Hungarian University of Transylvania, Tîrgu Mureş, Romania), Szabolcs Hajdú (Sapientia Hungarian University of Transylvania, Tîrgu Mureş, Romania), Fearghal Morgan (National University of Ireland, Galway)

17:15 On Symmetry Properties of Intrinsic Interference in FBMC-OQAM Systems...186
Vibhutesh Kumar Singh (University College Dublin), Mark F. Flanagan (University College Dublin), Barry Cardiff (University College Dublin)

| 1745 | ISSC Steering Committee Meeting | 01.017 |
| 1900 | Conference Banquet | Riddel Hall |

ISSC 2018

Friday 22 June		
0830	Registration	Foyer
0900	**KN-4 Brain-Computer Interfaces and Wearable Neurotechnology : Lab Experiments to Real World Applications** Prof. Damien Coyle (Ulster University)	01.005
0945	Coffee Break	Foyer

1000	**Fr1a Biomedical**	**02.014**
10:00	**Validation of low-cost wireless EEG system for measuring event-related potentials...192** Yongxiang Wang (Institute of Technology Blanchardstown), Zhengwei Wang (Insight Centre for Data Analytics, Dublin City University), William Clifford (Maynooth University), Charles Markham (Maynooth University), Tomas Ward (Insight Centre for Data Analytics, Dublin City University), Catherine Deegan (Institute of Technology Blanchardstown)	
10:20	**On sound-based interpretation of neonatal EEG...198** Sergi Gómez Quintana (University College Cork), Mark O'sullivan (University College Cork), Sean Mathieson (INFANT), Geraldine B. Boylan (INFANT), Emanuel Popovici (University College Cork), Andriy Temko (INFANT)	
10:40	**Distance Metric Approach for Nearest Neighbour Recall of Neonatal EEG...204** Brian Murphy (INFANT), Geraldine B. Boylan (INFANT), Gordon Lightbody (INFANT), William P. Marnane (INFANT)	
11:00	**The influence of flickering patterns on the quality of brain signals for Brain-Computer Interface...210** Artur Szalowski (Institute of Technology Carlow), Dorel Picovici (Institute of Technology Carlow)	

1000	**Fr1b Modelling & Identification**	**02.016**
10:00	**Short-Term Wind Speed Forecasting by Spectral Analysis...216** Huseyin Akcay (Anadolu University), Tansu Filik (Anadolu University)	
10:20	**Rail Track Modelling by Using Identification and Curve Fitting Techniques...221** Semiha Turkay (Anadolu University), Asli Soyic Leblebici (Osmangazi University), Huseyin Akcay (Anadolu University)	
10:40	**On the Identification of Piecewise Constant LTV Systems Using a Double Periodic System Model...227** Tim Poguntke (Robert Bosch GmbH), Karlheinz Ochs (Ruhr-Universität Bochum)	
11:00	**Hello & Goodbye: Conversation Boundary Identification Using Text Classification..235** Jonathan Dunne (Maynooth University), David Malone (Maynooth University)	

| **1120** | Break | Foyer |

Friday 22 June

1130 Fr2a Communications 02.014

11:30 **A Low Jitter Low Power and Wide Tuning Range Differential Ring Oscillator Topology in 28nm CMOS Technology for Clock Synthesizer Applications...242**
Giuseppe Macera (Analog Devices International)

11:50 **A 28nm CMOS 1.3-GHz Low Phase Noise Gm-Boosted Cross-Coupled DCO for Automotive Radar Applications...246**
Giuseppe Macera (Analog)

12:10 **Antenna Design for a 3D Image Radar System...251**
Colm Murphy (University College Cork), Emanuel Popovici (University College Cork), Phil Greenhalgh (Daqri International)

12:30 **Comparative Analysis of Circuit and Finite Element Models for a Linear Wire Dipole Antenna...257**
Sanjeev Kumar (Tyndall National Institute), John L. Buckley (Tyndall National Institute), Adolfo Di Serio (Tyndall National Institute), Brendan O'Flynn (Tyndall National Institute)

1130 Fr2b Image Processing 02.016

11:30 **A Novel Ultrasound Image Enhancement Algorithm Using Cascaded Clustering on Wavelet Sub-bands...263**
Prerna Singh (University of Canterbury), Ramakrishnan Mukundan (University of Canterbury), Rex De Ryke (Radiology Services, Canterbury District Health Service)

11:50 **Accelerating Image Algorithm Development using Soft Co-Processors on FPGAs...269**
Tiantai DENG (Queen's University Belfast), Danny Crookes (Queen's University Belfast), Roger Woods (Queen's University Belfast), Fahad Siddiqui (Queen's University Belfast)

12:10 **Block-based Classification Method for Computer Screen Image Compression...275**
Kai Wu (IT Tallaght), Richard Gahan (IT Tallaght), Patrick O'Friel (IT Tallaght)

12:30 **Information Hiding using Convolutional Encoding...281**
Jonathan Blackledge (Dublin Institute of Technology), Paul Tobin (Dublin Institute of Technology), Joyce Myeza (University of KwaZulu-Natal), Matthew Adolfo (Ministry of Defense)

1300 Closing and Lunch Foyer

1400 MATLAB Tutorial/Workshop 09.011