

2021 32nd Irish Signals and Systems Conference (ISSC 2021)

**Athlone, Ireland
10 – 11 June 2021**



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Thursday, 10 June

08:45 **General**
Doors Open
Stage - Shannon Stage

09:00 **General**
Welcome to ISSC 2021
Stage - Shannon Stage

09:15 **Keynote**
Keynote 1 - Dr. Amelia Kelly
Stage - Shannon Stage
Chaired by: Dr. Jackie Stewart

The Challenges Particular to Child Speech Recognition and Voice Technology...N/A
» Dr Amelia Kelly (VP of Speech Technology at SoapBox Labs)

10:00 **General**
Coffee Break
Stage - Shannon Stage

10:00 **General**
Doors Open
Stage - Lough Ree Stage

10:15

Oral

1A- Digital Signal Processing

Stage - Shannon Stage

Chaired by: Dr. Ronan Flynn

Multi-Resolution Pre-Processing for Pattern Recognition in Images and Audio Signals...1

» Mrs. Noha Mansor¹, Dr. Ronan Flynn¹, Dr. Mark Daly¹ (1. Athlone Institute of Technology)

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» Dr. Andy Murphy¹, Dr. Irena Yanushevskaya¹, Prof. Ailbhe Nf Chasaide¹, Dr. Christer Gobl¹ (1. Trinity College Dublin)

A Linear Predictive Coding Filtering Method for Time-resolved Morphology of EEG Activity...13

» Mr. nn Xu¹, Prof. Mark Davis², Dr. Ruairf de Frein¹ (1. Technological University Dublin, 2. TU Dublin)

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» Mr. Zac Dair¹, Mr. Ryan Donovan¹, Dr. Ruairf O'Reilly¹ (1. Munster Technological University)

10:15

Oral

1B -AI and Machine Learning

Stage - Lough Ree Stage

Chaired by: Dr. Paul Jacob

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» Ms. Nimra Munir¹, Dr. Konrad Mulrennan¹, Dr. Marion McAfee¹ (1. Centre for Precision Engineering, Materials and Manufacturing Research Institute of Technology Sligo)

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» Mr. Alec Barber¹, Dr. Anthony Quinn² (1. Institute of Information Theory and Automation, Czech Academy of Sciences, 2. Department of Electronic and Electrical Engineering, Trinity College Dublin, the University of Dublin)

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» Mr. Ahmad Ameer¹, Dr. Eoghan Furey¹, Ms. Juanita Blue¹ (1. Letterkenny Institute of Technology)

11 :35

Keynote

Keynote 2 - Dr. Martina Sciola

Stage - Shannon Stage

Chaired by: Dr. James Mooney

"How to train your robot with Deep Reinforcement Learning"...N/A

» Dr. Martina Sciola (Academia Team MathWorks)

12:20

Poster

Poster Teaser

Stage - Shannon Stage

Chaired by: Dr. Jackie Stewart

Blockchain in Food Traceability: A Systematic Literature Review...51

» Mr. Ahmad Ameer¹, Ms. Karen Bailey¹ (1. Letterkenny Institute of Technology)

Leveraging IoT Lifelog Data to Analyse Performance of Physical Activities...57

» Ms. Zahra Karami¹, Dr. Andrew Hines², Dr. Hamed Z Jahromi³ (1. IT Carlow, 2. University College Dubin, 3. University College Dublin)

Automated Design of CMOS Operational Amplifier Using a Neural Network...63

» Mr. Sean Donnacha Murphy¹, Dr. Kevin G. McCarthy² (1. University College Cork, 2. Electrical and Electronic Engineering, University College Cork)

Analysis of cough sound observed by different cough etiquettes...69

» Mr. Paul Leamy¹, Dr. Ted Burke¹, Dr. David Dorran¹ (1. Technological University Dublin)

Synchronisation Control Action for Very Low-Frequency Oscillations...75

» Mr. Connor Duggan¹, Dr. Paul Brogan¹, Dr. Xueqin LIU², Dr. Robert Best², Prof. JOHN MORROW¹ (1. Queens University Belfast, 2. Queen's University Belfast)

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» Dr. David Lavery¹, Mr. Guilhem Egrot¹, Mr. Andres Felipe Moreno Jaramillo¹ (1. Queen's University Belfast)

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» Mr. Swarnadeep Bagchi¹, Dr. Ruairf de Frein¹ (1. Technological University Dublin)

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Time-Frequency Analysis of Upper Limb Motion Based on Inertial Sensors...106

» Dr. Lu Bai¹ (1. Ulster University)

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» Mr. Rian Stephens¹, Mr. Anshul Awasthi¹, Dr. Katie Crowley², Dr. Fiona Boyle¹, Prof. Joseph Walsh¹ (1. Munster Technological University, 2. University of Limerick)

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» Mr. Davide Alfieri¹, Ms. Amruta Awasthi², Mr. Marco Belcastro¹, Mr. John Barton¹, Dr. BRENDAN O'FLYNN¹, Mr. Salvatore Tedesco¹ (1. Tyndall National Institute, University College Cork, 2. Munster Technological University)

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» Dr. Kevin Meehan¹, Mr. Jack McShane¹, Mr. Stephen McClay² (1. Letterkenny Institute of Technology, 2. AE Global)

An Adaptable Internet of Things Network Infrastructure Implemented for a Smart Building System...129

» Mr. Dillon Waters¹, Dr. Andrew Donnellan¹, Mr. John Fox¹ (1. Technological University Dublin)

12:35

**General
Lunch**

Stage - Shannon Stage

13:15

Poster

Poster Q&A

Stage - Shannon Stage

Chaired by: Dr. Ronan Flynn

Blockchain in Food Traceability: A Systematic Literature Review...N/A

» Mr. Ahmad Ameer¹, Ms. Karen Bailey¹ (1. Letterkenny Institute of Technology)

Leveraging IoT Lifelog Data to Analyse Performance of Physical Activities...N/A

» Ms. Zahra Karami¹, Dr. Andrew Hines², Dr. Hamed Z. Jahromi³ (1. IT Carlow, 2. University College Dubin, 3. University College Dublin)

Automated Design of CMOS Operational Amplifier Using a Neural Network...N/A

» Mr. Sean Donnacha Murphy¹, Dr. Kevin G. McCarthy² (1. University College Cork, 2. Electrical and Electronic Engineering, University College Cork)

Analysis of cough sound observed by different cough etiquettes...N/A

» Mr. Paul Leamy¹, Dr. Ted Burke¹, Dr. David Dorran¹ (1. Technological University Dublin)

Synchronisation Control Action for Very Low-Frequency Oscillations...N/A

» Mr. Connor Duggan¹, Dr. Paul Brogan¹, Dr. Xueqin Liu², Dr. Robert Best², Prof. JOHN MORROW¹ (1. Queens University Belfast, 2. Queen's University Belfast)

A Covid-19 Viral Transmission Prevention System for Embedded Devices Utilising Deep Learning...N/A

» Mr. Mihai Penica¹, Ms. Reenu Mohandas², Ms. Mangolika Bhattacharya¹, Mr. Karl Van Camp¹, Dr. Martin Hayes¹, Mr. Eoin O'Connell¹ (1. University of Limerick, 2. Univ)

Continued from **Thursday, 10 June**

Phasor Measurement Unit Development Toolkit Including PC Based Polyphase Signal Generator...N/A

» Dr. David Laverty¹, Mr. Guilhem Egrot¹, Mr. Andres Felipe Moreno Jaramillo¹ (1. Queen's University Belfast)

Extending Instantaneous De-mixing Algorithms to Anechoic Mixtures...N/A

» Mr. Swarnadeep Bagchi¹, Dr. Ruairf de Frein¹ (1. Technological University Dublin)

Hierarchical Bayesian Transfer Learning Between a Pair of Kalman Filters...N/A

» Dr. Milan Papez¹, Dr. Anthony Quinn² (1. Institute of Information Theory and Automation, Czech Academy of Sciences, 2. Department of Electronic and Electrical Engineering, Trinity College Dublin, the University of Dublin)

Time-Frequency Analysis of Upper Limb Motion Based on Inertial Sensors...N/A

» Dr. Lu Bai¹ (1. Ulster University)

A Literature Review of Virtual Reality Interpersonal Training for Salespeople...N/A

» Mr. Rian Stephens¹, Mr. Anshul Awasthi¹, Dr. Katie Crowley², Dr. Fiona Boyle¹, Prof. Joseph Walsh¹ (1. Munster Technological University, 2. University of Limerick)

Design of a Wearable Bruxism Detection Device...N/A

» Mr. Davide Alfieri¹, Ms. Amruta Awasthi², Mr. Marco Belcastro¹, Mr. John Barton¹, Dr. BRENDAN O'FLYNN¹, Mr. Salvatore Tedesco¹ (1. Tyndall National Institute, University College Cork, 2. Munster Technological University)

Utilising OpenCV with Tesseract to extract Bill of Materials (BOM) from Isometric Drawings...N/A

» Dr. Kevin Meehan¹, Mr. Jack McShane¹, Mr. Stephen McClay² (1. Letterkenny Institute of Technology, 2. AE Global)

An Adaptable Internet of Things Network Infrastructure Implemented for a Smart Building System...N/A

» Mr. Dillon Waters¹, Dr. Andrew Donnellan¹, Mr. John Fox¹ (1. Technological University Dublin)

13:20

General

Speaker Prep

Stage - Lough Ree Stage

13:30

Oral

2A - Biomedical Applications

Stage - Shannon Stage

Chaired by: Dr. Nadia Kanwal

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» Mr. Ardeshir Behrouzirad¹, Mr. Patrick Surgue¹, Mr. Miomir Todorovic¹, Dr. Kevin G. McCarthy², Dr. Paul Galvin¹ (1. Tyndall National Institute, University College Cork, 2. Electrical and Electronic Engineering, University College Cork)

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» Mr. Rajasekhar Nagulapalli¹, Mr. Rakesh Kumar Palani², Mr. Hayatleh Khaled¹, Mr. Nabil Yassine¹, Mr. Barker Steeve¹ (1. Oxford Brookes University, 2. IIT delhi)

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» Mr. Sean Murray¹, Dr. Anthony Quinn² (1. Mathematical Institute, University of Oxford, 2. Department of Electronic and Electrical Engineering, Trinity College Dublin, the University of Dublin)

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Stage - Lough Ree Stage

Chaired by: Dr. Brian Lee

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» Mr. Daniel Becker¹, Dr. Andrew Hines¹ (1. University College Dublin)

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» Mr. Shubham Aggarwa¹, Prof. DAVID MALONE¹ (1. Maynooth University)

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» Dr. Paul Brogan¹, Dr. John Hastings¹, Mr. Connor Duggan¹, Mr. Andres Felipe Moreno Jaramillo², Dr. David Laverty¹, Dr. Robert Best¹, Dr. Xueqin LIU¹, Prof. JOHN MORROW¹ (1. Queens University Belfast, 2. Queen's)

14:55

General

Coffee Break

Stage - Shannon Stage

15:10

Keynote

Keynote 3 - Enda Ward

Stage - Shannon Stage

Chaired by: Tom Bennett

Automotive Vision Systems - Challenges & Opportunities for the Future...N/A

» Enda Ward (Camera Architecture & Technology Group Leader/ Valeo Master Expert)

15:45

General

Speaker Prep

Stage - Lough Ree Stage

15:55

Oral

3A - Image and Video Processing

Stage - Shannon Stage

Chaired by: Dr. Yuhang Ye

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» Prof. Michael Smith¹, Ms. Ishani DasGupta¹, Prof. Elise Fear¹ (1. Electrical and Software Engineering, University of Calgary)

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» Ms. Maria Thomas¹, Dr. Kevin Meehan¹ (1. Letterkenny Institute of Technology)

Type III solar radio burst detection: A deep learning approach...197

» Mr. Jeremiah Scully¹, Dr. Ronan Flynn¹, Prof. Peter Gallagher², Dr. Eoin Carley², Dr. Mark Daly¹ (1. Athlone Institute of Technology, 2. Dublin institute of advanced studies)

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Oral

3B - Deep Learning

Stage - Lough Ree Stage

Chaired by: Dr. Yuansong Qiao

Continued from **Thursday, 10 June**

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» Ms. Mansura Habiba¹, Dr. Mehrdad Maleki¹, Dr. Barak Pearlmutter¹ (1. Maynooth University)

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» Ms. Reenu Mohandas¹, Ms. Mangolika Bhattacharya¹, Mr. Mihai Penica¹, Mr. Karl Van Camp¹, Dr. Martin Hayes¹ (1. University of Limerick)

18:00

Panel

ISSC Steering Committee

Stage - Shannon Stage

Friday, 11 June

08:45

General

Doors Open

Stage - Shannon Stage

09:00

Keynote

Keynote 4 - Donnacha O'Riordan

Stage - Shannon Stage

Chaired by: Theresa Costello

Imagining the next Industrial Revolution as more Human and less Industrial...N/A

» Donnacha O'Riordan (Director of Connected Motion & Robotics at Analog Devices Inc.)

09:45

General

Coffee Break

Stage - Shannon Stage

09:45

General

Doors Open

Stage - Lough Ree Stage

10:00

Oral

4A - System Modelling

Stage - Shannon Stage

Chaired by: Dr. Mamoon Asghar

I See You: An Anomaly Detection Framework for System Alerts...221

» Dr. Jonathan Dunne¹, Mr. Akash Bhargava¹ (1. IBM)

Simulating Disease in Periods of Low Mobility Using a Hybrid Diffusion and Compartmental Model Built on Geographic Data...229

» Mr. Conor Hackett¹, Prof. Rafael De Andrade Moral², Prof. Charles Markham¹ (1. Computer Science Department, National University of Ireland Maynooth, 2. Hamilton Institute/ Department of Mathematics and Statistics, National University of Ireland Maynooth)

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» Dr. Barry Cardiff¹, Mr. Haoyang Shen² (1. University College Dublin, 2. University College Dublin)

Multi-Objective Optimisation of Cortical Spiking Neural Networks With Genetic Algorithms...240

» Mr. James Fitzgerald¹, Dr. Kongfatt Wong-Lin¹ (1. School of Computing, Eng & Intel. Sys, Ulster University)

10:00

Oral

4B - Internet of Things and Sensor Networks

Stage - Lough Ree Stage

Chaired by: Dr. Enda Fallon

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» Ms. Sorcha Bennett¹, Dr. Joe Sullivan¹ (1. Limerick Institute of Technology)

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» Mr. Samuel Calvert¹, Dr. Emanuel Popovici¹, Dr. Paul Leahy¹ (1. University College Cork)

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» Mrs. Vini Vijayan¹, Mr. James Connolly¹, Prof. Joan Condell², Dr. Philip Gardiner³, Dr. Nigel McKelvey¹ (1. Letterkenny Institute of Technology, 2. School of Computing, Eng & Intel. Sys, Ulster University, 3. Rheumatology Department, Altnagelvin Hospital)

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» Dr. Paul Brogan¹, Dr. John Hastings¹, Mr. Connor Duggan¹, Mr. Andres Felipe Moreno Jaramillo¹, Dr. David Lavery¹, Dr. Robert Best¹, Dr. Xueqin Liu¹, Prof. JOHN MORROW¹ (1. Queens University Belfast)

11 :25

Keynote

Keynote 5 - Dr. Mark Daly & Dr. David Scott

Stage - Shannon Stage

Chaired by: Nigel Flynn

"From CCTV to SRB": Pattern Recognition in Video Data Streams...N/A

» Dr. Mark Daly & Dr. David Scott (Lecturer, Faculty of Engineering and Informatics, AIT.)

12:10

General

Prize Announcement and Close

Stage - Shannon Stage

On Demand

10 June

Bundle: OSessions released on-demand

12:00

Posters Review