

# EANN 2016

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17<sup>th</sup> International Conference on Engineering Applications of Neural Networks



**Robert Gordon University, Sir Ian Wood Building  
Garthdee Road, Aberdeen, AB10 7GJ  
UK, Scotland**



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## Friday 2<sup>nd</sup> September 2016

Start Time	End Time	Sessions
8:30	9:20	<b>Delegate Registration and Refreshments</b>
9:20	9:30	<b>Opening of the Conference</b>
9:30	10:30	<p><b>Keynote Lecture</b>            Deep Learning, Spiking Neural Networks and Spatio-Temporal Data Machines</p> <p><b>Professor Nikola Kasabov</b>            FIEEE, FRSNZ            Director KEDRI, <a href="http://www.kedri.info">http://www.kedri.info</a>            Professor SCMS, FDCT, Auckland University of Technology            EU Marie Curie Visiting Professor,            Institute for Neuroinformatics, ETH and University of Zurich            Honorary Professor Shanghai Jiao-Tong University            IEEE CIS Distinguished Lecturer</p> <p><i>The talk presents some principles of SNN and of deep learning in SNN. It introduces a recently proposed evolving SNN architecture called NeuCube. NeuCube is a non von Neumann, neuromorphic computational architecture, first proposed for brain data modelling. It was further developed as a general purpose SNN spatio-temporal data machine and a development system for the creation and testing of temporal or spatio/spectro temporal data applications. A version of the NeuCube development system is available from: <a href="http://www.kedri.aut.ac.nz/neucube/">http://www.kedri.aut.ac.nz/neucube/</a>, along with papers and case study data.</i></p>
10:30	11:30	<p><b>Session 1</b>            Active Learning and Dynamic Environments</p> <p><b>Session Chair: Eyad Elyan</b>  <b>20 minutes presentations including questions</b></p> <p><b>Ahmed Hussein, Mohamed Medhat Gaber and Eyad Elyan</b>  <i>Deep Active Learning for Autonomous Navigation</i></p> <p><b>Giovanni Masala, Bruno Golosio, Massimo Tistarelli and Enrico Grosso</b>  <i>2D Recurrent Neural Networks for Robust Visual Tracking of Non-Rigid Bodies</i></p> <p><b>Joana Costa, Catarina Silva, Mário Antunes and Bernardete Ribeiro</b>  <i>Choice of Best Samples for Building Ensembles in Dynamic Environments</i></p>
11:30	11:50	<b>Refreshments</b>

Start Time	End Time	Sessions
11:50	13:10	<p><b>Session 2</b> Classification Applications and Semi-supervised Modelling</p> <p><b>Session Chair: David Coufal</b> <b>20 minutes presentations including questions</b></p> <p><b>Ariel Ruiz-Garcia, Mark Elshaw, Abdulrahman Altahhan and Vasile Palade</b> <i>Emotion Recognition Using Facial Expression Images for a Robotic Companion</i></p> <p><b>Hana Schaabova, Vladimir Krajca, Vaclava Sedlmajerova, Olena Bukhtaieva, Lenka Lhotsk_a, Jitka Mohylova and Svojmil Petranek</b> <i>Application of Artificial Neural Networks for Analyses of EEG Record with Semi-Automated Etalons Extraction: A Pilot Study</i></p> <p><b>Ilias Bougoudis, Kostantinos Demertzis, Lazaros Iliadis, Antonios Papaleonidas and Vardis-Dimitris Anezakis</b> <i>Semi-Supervised Hybrid Modeling of Atmospheric Pollution in Urban centres</i></p> <p><b>Mario Malcangi</b> <i>Bio-Inspired Audio-visual Speech Recognition - Towards the Zero Instruction Set Computing</i></p>
13:10	14:10	<b>Lunch</b>
14:10	15:30	<p><b>Session 3</b> Clustering Applications</p> <p><b>Session Chair: Mario Malcangi</b> <b>20 minutes presentations including questions</b></p> <p><b>Adam Chudziak</b> <i>Economies clustering using SOM-based dissimilarity</i></p> <p><b>Marcos Levano and Andrea Albornoz</b> <i>Elastic Net Application: Case study to find solutions for the TSP in a Beowulf Cluster architectures</i></p> <p><b>Aliyu Ahmad Usman and Andrew Starkey</b> <i>A Comparison of methods for automated feature selection using a Self-Organising Map</i></p> <p><b>Hassan Hamdoun and Aliyu Ahmad Usman</b> <i>EEG-based Condition Clustering using Self-Organising Neural Network Map</i></p>
15:30	15:45	<b>Refreshments</b>

Start Time	End Time	Sessions
15:45	16:45	<p><b>Keynote Lecture</b> Why A.I. Needs P.R.</p> <p><b>Professor John MacIntyre</b></p> <p><i>Popular culture often presents a very negative, even threatening, view of artificial intelligence to the public. Professor MacIntyre will ask why this is the case, and what the A.I. "community" could, or should, do about it!</i></p>
16:50	17:30	<p><b>Session 4</b> Time-series prediction</p> <p><b>Session Chair: Vera Kurkova</b> <b>20 minutes presentations including questions</b></p> <p><b>Tim O'Shea, Johnathan Corgan and T. Charles Clancy</b> <i>Convolutional Radio Modulation Recognition Networks</i></p> <p><b>Tianhong Liu, Haikun Wei, Chi Zhang and Kanjian Zhang</b> <i>Mutual information with parameter determination approach for feature selection in multivariate time series prediction</i></p>
19:00	22:00	<b>Conference Banquet, Rox Hotel Market Street, Aberdeen</b>

## Saturday 3<sup>rd</sup> September 2016

Start Time	End Time	Sessions
9:00	9:30	<b>Refreshments</b>
9:30	10:30	<p><b>Keynote Lecture</b> Quantum-Inspired Evolutionary Algorithms Applied To Neural Network Modelling.</p> <p><b>Professor Marley Valesco</b></p> <p><i>This talk presents an overview of quantum-inspired evolutionary algorithms and their application to the evolution of different neural network models, such as Multi-Layer Perceptrons, Recurrent Neural Networks and Spiking Neural Networks. Applications in control, time series forecasting, pattern classification and clustering are presented. Additionally, the evolution of ensemble of classifiers in a concept drift environment is also provided.</i></p>

Start Time	End Time	Sessions
10:30	11:30	<p><b>Tutorial</b></p> <p><b>Marco Vannucci and Valentina Colla</b>  <i>Classification of Unbalanced Datasets and Detection of Rare Events in Industry: Issues and Solutions</i></p>
11:30	11:50	<b>Refreshments</b>
11:50	13:10	<p><b>Session 5</b>  Cyber-Physical Systems and Cloud Applications</p> <p><b>Session Chair: Marcos Lévano</b>  <b>20 minutes presentations including questions</b></p> <p><b>Andrei Petrovski, Prapa Rattadilok and Sergey Petrovskii</b>  <i>Intelligent Measurement in Unmanned Aerial Cyber Physical Systems for Traffic Surveillance</i></p> <p><b>Catalina Mara Hernandez Ruiz, Sergio Andrs Villagrñ Martnez and Paulo Alonso Gaona Garcia</b>  <i>Predictive model for detecting MQ2 gases using fuzzy logic on IoT devices</i></p> <p><b>Syed Noor-Ul-Hassan Shirazi, Ioannis Stephanakis, Antonios Gouglidis and David Hutchison</b>  <i>A Multi-Commodity Network Flow Model for Cloud Service Environments</i></p> <p><b>Farzan Majdani, Andrei Petrovski and Daniel Doolan</b>  <i>Designing a Context-Aware Cyber Physical System for Smart Conditional Monitoring of Platform Equipment page</i></p>
13:10	14:10	<b>Lunch</b>
14:10	15:10	<p><b>Invited Tutorial</b></p> <p><b>Amos Storkey and Harri Edwards, University of Edinburgh</b>  <i>Generative and Adversarial Deep Learning</i></p>
15:10	15:30	<b>Refreshments</b>
15:30	17:00	<p><b>Workshop (Room N345)</b>  Evolving Sensor Systems</p> <p><b>Session Chair: Nirmalie Wiratunga</b></p> <p><b>Jarez Patel , Francesco Fioranelli, Matthew Ritchie and Hugh Griffiths</b>  <i>Multistatic Radar Classification of Armed vs Unarmed Personnel Using Neural Networks</i></p> <p><b>Maurizio Fiasché and Diego E. Liberati</b>  <i>Smart Maintenance in Industry: a Smart end-to-end Architecture</i></p>

		<p><b>Christopher McDermott, Wanqing Tu and Andrei Petrovski</b> <i>Anomaly Detection in 6LoWPAN-based Wireless Sensor Networks</i></p> <p><b>Sadiq Sani, Nirmalie Wiratunga, Stewart Massie and Kay Cooper</b> <i>Personalised Activity Recognition using Incremental Learning</i></p>
17:00	18:15	<b>Drinks Reception (Room N204)</b>
18:15	20:00	<b>Aberdeen Sightseeing</b>

## Sunday 4<sup>th</sup> September 2016

Start Time	End Time	Sessions
9:00	9:30	<b>Refreshments</b>
9:30	10:30	<p><b>Tutorial</b> <i>Machine Learning and Nature Inspired Techniques in Industry 4.0</i></p> <p><b>Maurizio Fiasché,</b> Ph.D., SIEEE, Politecnico di Milano, Industrial Relations Co-Chair of the IEEE Italy Section, SIG EANN member</p>
10:30	12:10	<p><b>Session 6</b> Learning-Algorithms</p> <p><b>Session Chair: Andrei Petrovski</b> <b>20 minutes presentations including questions</b></p> <p><b>Toshinori Deguchi and Naohiro Ishii</b> <i>On Learning Parameters of Incremental Learning in Chaotic Neural Net-work page</i></p> <p><b>Alan J. Thomas, Simon D. Walters, Miltos Petridis, Saeed Malekshahi Ghey-tassi and Robert E. Morgan</b> <i>Accelerated Optimal Topology Search for Two-hidden-layer Feedforward Neural Networks</i></p> <p><b>Khaled Fawagreh, Mohamed Gaber and Eyad Elyan</b> <i>An Outlier Ranking Tree Selection Approach to Extreme Pruning of Random Forests page</i></p> <p><b>Vera Kurkova</b> <i>Lower Bounds on Complexity of Shallow Perceptron Networks</i></p> <p><b>David Coufal</b> <i>Kernel Networks for Function Approximation</i></p>
12:10	13:10	<b>Lunch</b>

Start Time	End Time	Sessions
13:10	14:10	<p><b>Session 7</b> Speech Recognition and Modelling</p> <p><b>Session Chair: Chrisina Jayne</b> <b>20 minutes presentations including questions</b></p> <p><b>Ryotaro Kamimura</b> <i>Simple and Stable Internal Representation by Potential Mutual Information Maximization</i></p> <p><b>Hazrat Ali, Nasir Ahmad and Abdul Hafeez</b> <i>Urdu Speech Corpus and Preliminary Results on Speech Recognition</i></p> <p><b>Petr Hajek and Jana Bohacova</b> <i>Predicting Abnormal Bank Stock Returns Using Textual Analysis of Annual Reports A Neural Network Approach</i></p>
14:10	15:10	<p><b>Tutorial</b></p> <p><b>Silvia Cateni and Valentina Colla</b> <i>Variable selection for efficient design of neural networks and other machine learning-based models: efficient approaches for industrial applications</i></p>
15:10	15:20	<b>Closing of Conference and Presentation of Prizes</b>

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**Monday 5<sup>th</sup> September 2016**

## **Glenfiddich Distillery Excursion**

*The Glenfiddich Distillery, Dufftown, Banffshire AB55 4DH*

**10.00 Depart Robert Gordon University**

**11.00 Arrive Deans of Huntly Visitor Centre**

It was here that Helen first created her delicious traditional shortbread, and her friends and family loved the ‘melt in the mouth’ sensation. Her husband Bill, a Drum Major, thought it was so delicious he decided to use Helen’s baking to help raise funds for the local Huntly pipe band. Their touring helped spread her shortbread’s fame far and wide, and soon, the aroma of home baking would fill the town as Helen established her own small bakery to meet demand. So popular was the light and crumbly shortbread that in 1992, Dean’s moved to a new purpose built bakery on the outskirts of Huntly. Today, Dean’s is still a family run business priding itself on using timehonoured handcrafted baking methods, and is recognised as ‘The Leading Premium Quality Scottish Shortbread’.



**12.00 Lunch at Deans of Huntly**

**13.00 Depart Deans for Glenfiddich Distillery**

**13.30 Arrive at Glenfiddich Distillery**

For 20 years William Grant nurtured a dream to make the ‘best dram in the valley’. With the help of his family, he finally achieved that vision. In the summer of 1886, with his seven sons and two daughters by his side, William set out to fulfil a lifelong ambition. Together they began building his Distillery by hand, stone by stone. After a single year of work it was ready and William named it Glenfiddich, Gaelic for Valley of the Deer. William’s passion, determination and pioneering spirit continues to guide us today. Glenfiddich is one of the few single malt distilleries to remain entirely family owned and is now the World's Most Awarded Single Malt\* Scotch Whisky, a true reflection of our founder’s innovative nature, passed down through the generations.



**15.00 Depart Glenfiddich Distillery for Speyside Cooperage**

**15:05 Arrive Speyside Cooperage**

Speyside Cooperage, home of the ancient art of coopering since 1947. Our five star award winning exhibition will take you on a journey from Acorn to Cask. Immersed in our 4D sensory cinematic film experience, savour the sights, sounds and smells of our working cooperage.

**16.30 Depart Speyside Cooperage for Aberdeen**

