

# **2017 International Joint Conference on Neural Networks (IJCNN 2017)**

**Anchorage, Alaska, USA  
14-19 May 2017**

**Pages 1-634**



**IEEE Catalog Number: CFP17IJS-POD  
ISBN: 978-1-5090-6183-9**

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|                         |                   |
|-------------------------|-------------------|
| IEEE Catalog Number:    | CFP17IJS-POD      |
| ISBN (Print-On-Demand): | 978-1-5090-6183-9 |
| ISBN (Online):          | 978-1-5090-6182-2 |
| ISSN:                   | 2161-4393         |

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## Session Extreme Learning Machines

Room: Parallel 3 (Room #2+11+12)

9:20 am - 10:40 am

Session Chair: Philip de Chazal

**A Theoretical Study of the Relationship between an ELM Network and its Subnetworks [#0025]** ..... 1794

Enmei Tu, Guanghao Zhang, Lily Rachmawati, Eshan Rajabally, Shangbo Mao and Guang-Bin Huang

**Regularized Training of the Extreme Learning Machine using the Conjugate Gradient Method [#0773]** ..... 1802

Philip de Chazal and Mark D. McDonnell

**Reconstruction of Bifurcation Diagrams using an Extreme Learning Machine with a Pruning Algorithm [#0166]** ..... 1809

Yoshitaka Itoh and Masaharu Adachi

**A Low-Dimensional Vector Representation for Words using an Extreme Learning Machine [#0731]** ..... 1817

Paula Lauren, Guangzhi Qu, Guang-Bin Huang, Paul Watta and Amaury Lendasse

## Session Spiking Neurons: Adaptation 1

Room: Parallel 4 (Room #3+10+9)

9:20 am - 10:40 am

Session Chair: Timoleon Moraitis

**Fatiguing STDP: Learning from Spike-Timing Codes in the Presence of Rate Codes [#0879]** . 1823

Timoleon Moraitis, Abu Sebastian, Irem Boybat, Manuel Le Gallo, Tomas Tuma and Evangelos Eleftheriou

**Spike Timing-Dependent Conduction Delay Learning Model Classifying Spatio-Temporal Spike Patterns [#0164]** ..... 1831

Takashi Matsubara

**Unsupervised Learning of Event-Based Image Recordings using Spike-Timing-Dependent Plasticity [#0290]** ..... 1840

Laxmi R. Iyer and Arindam Basu

**Spike Timing Dependent Plasticity based Enhanced Self-Learning for Efficient Pattern Recognition in Spiking Neural Networks [#0719]** ..... 1847

Gopalakrishnan Srinivasan, Sourjya Roy, Vijay Raghunathan and Kaushik Roy

## Session Deep learning 5: Applications

Room: Parallel 5 (Room #4+7+8)

9:20 am - 10:40 am

Session Chair: Jian Zhang

**Deep Learning Approach to Link Weight Prediction [#0092]** ..... 1855

Yuchen Hou and Lawrence B. Holder

**Deep Boltzmann Machines for Robust Fingerprint Spoofing Attack Detection [#0223]** ..... 1863  
Gustavo B. Souza, Daniel F.S. Santos, Rafael G. Pires, Aparecido N. Marana and João P. Papa

**Classification of Android Apps and Malware using Deep Neural Networks [#0547]** ..... 1871  
Robin Nix and Jian Zhang

**Context Preference-Based Deep Adaptive Resonance Theory: Integrating User Preferences into Episodic Memory Encoding and Retrieval [#0305]** ..... 1879  
Dick Sigmund, Gyeong-Moon Park and Jong-Hwan Kim

## **Session Theory 5**

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**9:20 am - 10:40 am**

**Session Chair: Michael Potter**

**Neural Networks and the Search for a Quadratic Residue Detector [#0447]** ..... 1887  
Michael Potter, Leon Reznik and Stanislaw Radziszowski

**Stochastic Diagonal Approximate Greatest Descent in Neural Networks [#0568]** ..... 1895  
Hong Hui Tan, King Hann Lim and Hendra Gunawan Harno

**Nesterov's Accelerated Gradient and Momentum as Approximations to Regularised Update Descent [#0673]** ..... 1899  
Aleksandar Botev, Guy Lever and David Barber

**On improving Recurrent Neural Network for Image Classification [#0027]** ..... 1904  
B. Chandra and Rajesh Kumar Sharma

## **Session Concept Drift, Domain Adaptation, and Learning in Dynamic Environments 2**

**Room: Parallel 1 (Cook)**

**11:00 am - 12:20 pm**

**Session Chair: Robi Polikar**

**Incremental Learning with the Minimum Description Length Principle [#0891]** ..... 1908  
Pierre-Alexandre Murena, Antoine Cornuéjols and Jean-Louis Desselles

**BLPA: Bayesian Learn-Predict-Adjust Method for Online Detection of Recurrent Changepoints [#0774]** ..... 1916  
Alexandr Maslov, Mykola Pechenizkiy, Yulong Pei, Indrė Žliobaitė, Alexander Shklyaeve, Tommi Kärkkäinen and Jaakko Hollmén

**An Incremental Ensemble Classifier Learning by Means of a Rule-Based Accuracy and Diversity Comparison [#0460]** ..... 1924  
Md Asafuddoula, Brijesh Verma and Mengjie Zhang

**Pattern Classification with Meta-Cognition and Online Sequential Learning Algorithm [#0469]** ..... 1932  
Skanda S. Bharadwaj, R. Chandan Kumar, B.N. Sumukha and Koshy George



## Session Optimizing Neural Networks via Evolutionary Computation and Swarm Intelligence

Room: Parallel 2 (Room #1+13+14)

11:00 am - 12:20 pm

Session Chair: Wei-Chang Yeh

**Investigation of Long Short-Term Memory Networks to Temperature Prediction for Permanent Magnet Synchronous Motors [#0028]** ..... 1940

Oliver Wallscheid, Wilhelm Kirchgässner and Joachim Böcker

**Improved Performance of Face Recognition using CNN with Constrained Triplet Loss Layer [#0408]** ..... 1948

Henry Wing Fung Yeung, Jiayi Li and Yuk Ying Chung

**A Novel Stacked Denoising Autoencoder with Swarm Intelligence Optimization for Stock Index Prediction [#0757]** ..... 1956

Jiayi Li, Guang Liu, Henry Wing Fung Yeung, Junfu Yin, Yuk Ying Chung and Xiaoming Chen

**An Evolutionary Method for Creating Ensembles with Adaptive Size Neural Networks for Predicting Hourly Solar Irradiance [#0260]** ..... 1962

Raka Jovanovic, Luis M. Pomares, Yasir E. Mohieldeen, Daniel Perez-Astudillo and Dunia Bachour

## Session Extreme Learning Machines

Room: Parallel 3 (Room #2+11+12)

11:00 am - 12:20 pm

Session Chair: Philip de Chazal

**Semi-Supervised Convolutional Extreme Learning Machine [#0776]** ..... 1968

Mahmood Yousefi-Azar and Mark D. McDonnell

**Objective Cost-Sensitive-Boosting-WELM for Handling Multi Class Imbalance Problem [#0582]** ..... 1975

Zhen Liu, Deyu Tang, Jincheng Li and Ruoyu Wang

**Online Recurrent Extreme Learning Machine and its Application to Time-Series Prediction [#0880]** ..... 1983

Jin-Man Park and Jong-Hwan Kim

**Extreme Learning Machines to Approximate Low Dimensional Spaces for Helicopter Load Signal and Fatigue Life Estimation [#0508]** ..... 1991

Julio J. Valdés, Catherine Cheung and Alejandro Lehman Rubio

## Session Spiking Neurons: Adaptaion 2

Room: Parallel 4 (Room #3+10+9)

11:00 am - 12:20 pm

Session Chair: Meghan Galiardi

**Stable Spike-Timing Dependent Plasticity Rule for Multilayer Unsupervised and Supervised Learning [#0754]** ..... 1999

Amar Shrestha, Khadeer Ahmed, Yanzhi Wang and Qinru Qiu

**Calcium-Modulated Supervised Spike-Timing-Dependent Plasticity for Readout Training and Sparsification of the Liquid State Machine [#0901]** ..... 2007

Yingyezhe Jin and Peng Li

**Optimization-Based Computation with Spiking Neurons [#0194]** ..... 2015

Stephen J. Verzi, Craig M. Vineyard, Eric D. Vugrin, Meghan Galiardi, Conrad D. James and James B. Aimone

**Multi-Layer Unsupervised Learning in a Spiking Convolutional Neural Network [#0245]** .... 2023

Amirhossein Tavanaei and Anthony S. Maida

## Session Deep Learning 6: Applications

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Session Chair: Bill Howell

**Action Unit Selective Feature Maps in Deep Networks for Facial Expression Recognition [#0628]** ..... 2031

Yuqian Zhou and Bertram E. Shi

**How to Get Pavement Distress Detection Ready for Deep Learning? A Systematic Approach [#0660]** ..... 2039

Markus Eisenbach, Ronny Stricker, Daniel Seichter, Karl Amende, Klaus Debes, Maximilian Sesselmann, Dirk Ebersbach, Ulrike Stoeckert and Horst-Michael Gross

**Deep Neural Networks for Kitchen Activity Recognition [#0723]** ..... 2048

Juarez Monteiro, Roger Granada, Rodrigo C. Barros and Felipe Meneguzzi

**Deep Convolutional Neural Networks for Pedestrian Detection with Skip Pooling [#0491]** ..... 2056

Jie Liu, Xingkun Gao, Nianyuan Bao, Jie Tang and Gangshan Wu

## Session Theory 6

Room: Parallel 6 (Room #5+6)

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Session Chair: Ulf Johansson

**Balanced Self-Paced Learning with Feature Corruption [#0270]** ..... 2064

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**Model-Agnostic Nonconformity Functions for Conformal Classification [#0485]** ..... 2072  
Ulf Johansson, Henrik Linusson, Tuve Löfström and Henrik Boström

**DropIn: Making Reservoir Computing Neural Networks Robust to Missing Inputs by Dropout [#0629]** ..... 2080  
Davide Bacciu, Francesco Crecchi and Davide Morelli

**Information-Theoretic Dataset Selection for Fast Kernel Learning [#0598]** ..... 2088  
António R.C. Paiva

**Session Datastream Mining**  
**Room: Parallel 1 (Cook)**  
**2:50 pm - 4:30 pm**  
**Session Chair: Plamen Angelov**

**Power Plant Performance Modeling with Concept Drift [#0640]** ..... 2096  
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**Concept Drift Learning with Alternating Learners [#0509]** ..... 2104  
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**Parametric System Identification using Deep Convolutional Neural Networks [#0745]** ..... 2112  
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**Online Query by Committee for Active Learning from Drifting Data Streams [#0860]** ..... 2120  
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**Sub-Event Detection from Tweets [#0735]** ..... 2128  
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**Session Chair: Minho Lee**

**Symbolic Manipulation based on Deep Neural Networks and its Application to Axiom Discovery [#0020]** ..... 2136  
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**Significance of Neural Phonotactic Models for Large-Scale Spoken Language Identification [#0169]** ..... 2144  
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**Temporal Hierarchies in Multilayer Gated Recurrent Neural Networks for Language Models [#0861]** ..... 2152  
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| <br><b>Design of a Time Delay Reservoir using Stochastic Logic: A Feasibility Study [#0708]</b> .....   | 2186 |
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**Deep Learning of Texture and Structural Features for Multiclass Alzheimer's Disease Classification [#0686]** ..... 2259  
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**Virtual Guide Dog: An Application to Support Visually-Impaired People through Deep Convolutional Neural Networks [#0696]** ..... 2267  
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**Vertex Reconstruction of Neutrino Interactions using Deep Learning [#0739]** ..... 2275  
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**Learning Deep Representations with Diode Loss for Quantization-Based Similarity Search [#0046]** ..... 2282  
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**Session Chair: Tharun Reddy**

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**HJB Equation based Learning Scheme for Neural Networks [#0337]** ..... 2298  
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**Supervised Classification via Constrained Subspace and Tensor Sparse Representation [#0380]** ..... 2306  
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**Parallel Dynamic Search Fireworks Algorithm with Linearly Decreased Dimension Number Strategy for Solving Conditional Nonlinear Optimal Perturbation [#0472]** ..... 2314  
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**Parametric Identification of Stochastic Interaction Networks [#0039]** ..... 2322  
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Session Chair: Seif-Eddine Benkabou (tentative)

**State Initialization for Recurrent Neural Network Modeling of Time-Series Data [#0127]** .... 2330

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**A Framework for Benchmarking Machine Learning Methods using Linear Models for Univariate Time Series Prediction [#0177]** ..... 2338

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**Adaptive Learning Method of Recurrent Temporal Deep Belief Network to Analyze Time Series Data [#0525]** ..... 2346

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**Spatio-Temporal Cellular Automata-Based Filtering for Image Sequence Denoising [#0398]** .. 2362

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## Session Text and Document Processing

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Session Chair: Giacomo Boracchi

**Tightly-Coupled Convolutional Neural Network with Spatial-Temporal Memory for Text Classification [#0557]** ..... 2370

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**Ensemble Application of Convolutional and Recurrent Neural Networks for Multi-Label Text Categorization [#0160]** ..... 2377

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Session Chair: Nathan McDonald

**Photonic Reservoir Computer with Output Feedback for Chaotic Time Series Prediction [#0224]** ..... 2407

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**Robustness of a Memristor based Liquid State Machine [#0687]** ..... 2414

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**Room: Parallel 1 (Cook)**

**9:20 am - 10:40 am**

**Session Chair: Emanuele Principi**

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## Session Explainability and Interpretability in Machine Learning

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Session Chair: Ricardo Cerri

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Session Chair: Veronica Bolon-Canedo

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