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| 1:30PM | <i>Exploring the Performance of Non-Negative Multi-Way Factorization for Household Electrical Seasonal Consumption Disaggregation</i><br>Marisa Figueiredo, Bernardete Ribeiro and Ana de Almeida | 899 |
| 1:50PM | <i>Community Detection Based on Local Topological Information in Power Grid</i><br>Zengqiang Chen, Zheng Xie and Qing Zhang   | 907 |
| 2:10PM | <i>A Heuristic to Generate Initial Feasible Solutions for the Unit Commitment Problem</i><br>Yi Sun, Y.S. Albert Lam and O.K. Victor Li   | 913 |
| 2:30PM | <i>Computational Intelligence in Smart Water and Gas Grids: An Up-to-Date Overview</i><br>Marco Fagiani, Stefano Squartini, Leonardo Gabrielli, Mirco Pizzichini and Susanna Spinsante            | 921 |

|        |  |     |
|--------|--|-----|
| 2:50PM | <i>Residential Energy System Control and Management Using A Hill-Climbing Heuristic Method</i><br>Luiz Carlos Roth, Eugenius Kaszkurewicz and Amit Bhaya | 927 |
|--------|--|-----|

**Special Session: TuN1-2 Intelligent Vehicle Systems, Chair: Chaomin Luo and Yi Murphey, Room: 305A**

|        |   |     |
|--------|---|-----|
| 1:30PM | <i>A Computationally Efficient Neural Dynamics Approach to Trajectory Planning of an Intelligent Vehicle</i><br>Chaomin Luo and Jiyong Gao  | 934 |
| 1:50PM | <i>Decision Tree Assisted EKF for Vehicle Slip Angle Estimation Using Inertial Motion Sensors</i><br>James Coyte, Boyuan Li, Haiping Du, Weihua Li, David Stirling and Montserrat Ros | 940 |
| 2:10PM | <i>Traffic Sign Recognition Using a Novel Permutation-Based Local Image Feature</i><br>Tian Tian, Ishwar Sethi and Patel Nilesh   | 947 |
| 2:30PM | <i>Specific Humidity Forecasting Using Recurrent Neural Network</i><br>Chen Fang, Xipeng Wang and Yi Murphey  | 955 |
| 2:50PM | <i>A Computationally Efficient Complete Area Coverage Algorithm for Intelligent Mobile Robot Navigation</i><br>Eene Eu Jan, Shao-Ting Shih, Lun-Ping Hung and Chaomin Luo             | 961 |
| 3:10PM | <i>Intelligent Trip Modeling on Ramps Using Ramp Classification and Knowledge Base</i><br>Xipeng Wang, Jungme Park, Yi Murphey, Johannes Kristinsson, Ming Kuang and Tony Phillips    | 967 |

**Special Session: TuN1-3 Biologically Inspired Computational Vision, Chair: Khan Iftekharuddin, Room: 305B**

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Plant Recognition Based on Intersecting Cortical Model</i><br>Zhaobin Wang, Xiaoguang Sun, Yaonan Zhang, Yide Ma, Hongjuan Zhang, Yurun Ma and Weiyong Xie                     | 975  |
| 1:50PM | <i>Image Factorization and Feature Fusion for Enhancing Robot Vision in Human Face Recognition</i><br>Hui Yu  | 981  |
| 2:10PM | <i>Linear Regression for Head Pose Analysis</i><br>Hui Yu and Honghai Liu   | 987  |
| 2:30PM | <i>Improved Training of Cellular SRN Using Unscented Kalman Filtering for ADP</i><br>Lasitha Vidyaratne, Mahbulul Alam, John Anderson and Khan Iftekharuddin                      | 993  |
| 2:50PM | <i>Retinal Blood Vessel Segmentation Using Bee Colony Optimisation and Pattern Search</i><br>Eid Emary, Hossam Zawbaa, Aboul Ella Hassanien, Gerald Schaefer and Ahmad Taher Azar | 1001 |
| 3:10PM | <i>Shoreline Extraction from the Fusion of LiDAR DEM Data and Aerial Images Using Mutual Information and Genetic Algorithms</i><br>Amr Yousef and Khan Iftekharuddin              | 1007 |

**TuN1-4 Real World Applications II, Chair: Lipo Wang, Room: 305C**

|        |   |      |
|--------|---|------|
| 1:30PM | <i>A Novel Fuzzy Multi-Objective Framework to Construct Optimal Prediction Intervals for Wind Power Forecast</i><br>Abdollah Kavousi-Fard, Abbas Khosravi and Saeid Nahavandi | 1015 |
| 1:50PM | <i>AORS: Affinity-Based Outlier Ranking Score</i><br>Shaohong Zhang, Hau-San Wong, Wen-Jun Shen and Dongqing Xie  | 1020 |
| 2:10PM | <i>Applications of Probabilistic Model Based on JoyStick Probability Selector</i><br>Marko Jankovic and Nikola Georgijevic  | 1028 |
| 2:30PM | <i>An Intelligent Analysis and Prediction Model for On-Demand Cloud Computing Systems</i><br>Xiuju Fu, Xiaorong Li, Yongqing Zhu, Lipo Wang and Siow mong, Rick Goh           | 1036 |
| 2:50PM | <i>Learning Using Privileged Information (LUPI) for Modeling Survival Data</i><br>Han-Tai Shiao and Vladimir Cherkassky   | 1042 |
| 3:10PM | <i>A Google Approach for Computational Intelligence in Big Data</i><br>Andreas Antoniadis and Clive Cheong Took   | 1050 |

**TuN1-5 Feedforward Neural Networks II, Chair: Brijesh Verma, Room: 305D**

- 1:30PM *Explicit Feature Mapping via Multi-Layer Perceptron and Its Application to Mine-Like Objects Detection*  
Hang Shao and Nathalie Japkowicz 1055
- 1:50PM *Compressing VG-RAM WNN Memory for Lightweight Applications*  
Edilson de Aguiar, Avelino Forechi, Lucas de Paula Veronese, Mariella Berger, Alberto F. De Souza, Claudine Badue and Oliveira-Santos Thiago 1063
- 2:10PM *Data Driven Modeling for UGI Gasification Process via a Variable Structure Genetic BP Neural Network*  
Shida Liu, Zhongsheng Hou and Chenkun Yin 1071
- 2:30PM *MofN Rule Extraction from Neural Networks Trained with Augmented Discretized Input*  
Rudy Setiono, Arnulfo Azcarraga and Yoichi Hayashi 1079
- 2:50PM *Optimizing Configuration of Neural Ensemble Network for Breast Cancer Diagnosis*  
Peter McLeod and Brijesh Verma 1087
- 3:10PM *An Efficient Conjugate Gradient Based Multiple Optimal Learning Factors Algorithm of Multilayer Perceptron Neural Network*  
Xun Cai, Kanishka Tyagi and Michael T Manry 1093

**TuN1-6 Supervised Learning I, Chair: Jose Principe, Room: 305E**

- 1:30PM *Imputation of Missing Data Supported by Complete  $p$ -Partite Attribute-Based Decision Graphs*  
Joao Bertini, Maria Nicoletti and Liang Zhao 1100
- 1:50PM *An Asymmetric Stagewise Least Square Loss Function for Imbalanced Classification*  
Guibiao Xu, Bao-Gang Hu and Jose Principe 1107
- 2:10PM *An Analysis Based on  $F$ -Discrepancy for Sampling in Regression Tree Learning*  
Cristiano Cervellera, Mauro Gaggero and Danilo Maccio 1115
- 2:30PM *Coupled Fuzzy  $k$ -Nearest Neighbors Classification of Imbalanced Non-IID Categorical Data*  
Chunming Liu, Longbing Cao and Philip S Yu 1122
- 2:50PM *Wind Power Forecasting- An Application of Machine Learning in Renewable Energy*  
Jawad Ali, Gul Muhammad Khan and Sahibzada Ali Mahmud 1130
- 3:10PM *Signature Identification via Efficient Feature Selection and GPU-Based SVM Classifier*  
Bernardete Ribeiro, Noel Lopes and Joao Goncalves 1138

**Tuesday, July 8, 3:30PM-6:00PM****Poster Session: PN2 Poster Session 2, Chair: Danil Prokhorov, Room: Posters Area (Level 3)**

- P301 *Hopfield Neural Network for Seismic Velocity Picking*  
Kou-Yuan Huang and Jia-Rong Yang 1146
- P302 *Deep Neural Networks for Mandarin Tone Recognition*  
Mingming Chen, Zhanlei Yang and WenJu Liu 1154
- P303 *An Adaptive Multiclass Boosting Algorithm for Classification*  
Shixun Wang, Peng Pan and Yansheng Lu 1159
- P304 *Animal Group Behavioral Model with Evasion Mechanism*  
Zhiping Duan and Xiaodong Gu 1167
- P305 *Superpixel Appearance and Motion Descriptors for Action Recognition*  
Xuan Dong, Ah-Chung Tsoi and Sio-Long Lo 1173
- P306 *Structured Sparse Coding Method for Infrared Small Target Detection in Video Sequence*  
Chunwei Yang, Huaping Liu, Shouyi Liao and Shicheng Wang 1179
- P307 *Human Activity Recognition Using Smart Phone Embedded Sensors: A Linear Dynamical Systems Method*  
Wen Wang, Huaping Liu, Lianzhi Yu and Fuchun Sun 1185

|      |   |      |
|------|---|------|
| P308 | <i>Effect of Spectrum Occupancy on the Performance of a Real Valued Neural Network Based Energy Detector</i><br>Adeiza James Onumanyi, Elizabeth Onwuka, Abiodun Musa Aibinu, Okechukwu Ugweje and Momoh Jimoh Salami | 1191 |
| P309 | <i>Scale Invariant Feature Transform Flow Trajectory Approach with Applications to Human Action Recognition</i><br>Jia-Tao Zhang, Ah-Chung Tsoi and Sio-Long Lo   | 1197 |
| P310 | <i>An Effective Criterion for Pruning Reservoir's Connections in Echo State Networks</i><br>Simone Scardapane, Gabriele Nocco, Danilo Comminiello, Michele Scarpiniti and Aurelio Uncini                              | 1205 |
| P311 | <i>Similarity-Balanced Discriminant Neighborhood Embedding</i><br>Chuntao Ding, Li Zhang, Yaping Lu and Shuping He  | 1213 |
| P312 | <i>Stability of a Neutral Delay Neuron System in the Critical Case</i><br>Xiaofeng Liao   | 1221 |
| P313 | <i>Further Enhancements in WOM Algorithm to Solve the Local Minimum and Flat-Spot Problem in Feed-Forward Neural Networks</i><br>Chi Chung Cheung, Sin Chun Ng, Andrew K Lui and Sean Shensheng Xu                    | 1225 |
| P314 | <i>Extending Dynamic SOMs to Capture Incremental Changes in Data</i><br>Thushan Ganegedara, Lasindu Vidana Pathirana, Ruwan Gunarathna, Buddhima Wijeweera, Amal Shehan and Damminda Alahakoon                        | 1231 |
| P315 | <i>Application of Fuzzy Systems in the Control of a Shunt Active Power Filter with Four-Leg Topology</i><br>Edson Junior Acordi, Ivan Nunes Silva and Ricardo Quadros Machado   | 1239 |
| P316 | <i>Highly Sensitive Weak Signal Acquisition Method for GPS/Compass</i><br>Song Li, Qing-ming Yi, Min Shi and Qing Chen  | 1245 |
| P317 | <i>Mining User Tasks from Print Logs</i><br>Xin Li, Lei Zhang, Ping Luo, Enhong Chen, Guandong Xu, Yu Zong and Chu Guan   | 1250 |
| P318 | <i>Adaptive Backstepping-Based Nonlinear Disturbance Observer for Fin Stabilizer System</i><br>Weiwei Bai and Tieshan Li  | 1258 |
| P319 | <i>Multiagent Evolutionary Design of Flexible Beta Basis Function Neural Tree</i><br>Marwa Ammar, Souhir Bouaziz, Adel M. Alimi and Ajith Abraham   | 1265 |
| P320 | <i>Similarity Michaelis-Menten Law Pre-Processing Descriptor for Face Recognition</i><br>Suli Ji, Baochang Zhang, Dandan Du and Jianzhuang Liu  | 1272 |
| P321 | <i>Single Image Super-Resolution via Learned Representative Features and Sparse Manifold Embedding</i><br>Liao Zhang, Shuyuan Yang, Jiren Zhang and Licheng Jiao  | 1278 |
| P322 | <i>Facial Expression Recognition under Random Block Occlusion Based on Maximum Likelihood Estimation Sparse Representation</i><br>S. S. Liu, Y. Zhang and K. P. Liu   | 1285 |
| P323 | <i>Non-Singular Terminal Sliding Mode Control for Landing on Asteroids Based on RBF Neural Network</i><br>K. P. Liu, F. X. Liu, S. S. Liu and Y. C. Li  | 1291 |
| P324 | <i>Automatic Forest Species Recognition Based on Multiple Feature Sets</i><br>Marcelo N. Kapp, Rodrigo Bloot, Paulo R. Cavalin and Luiz E. S. Oliveira  | 1296 |
| P325 | <i>Approximate Planning in POMDPs via MDP Heuristic</i><br>Yong Lin, Xingjia Lu and Makedon Fillia  | 1304 |
| P326 | <i>A Neural Network Left-Inversion Flux Estimation for Induction Motor Field-Oriented Control</i><br>Hao Zhang, Guohai Liu, Li Qu and Yan Jiang   | 1310 |
| P327 | <i>The Transformer Fault Diagnosis Combining KPCA with PNN</i><br>Chenxi Dai, Zhigang Liu and Yan Cui   | 1314 |
| P328 | <i>Classifying Web Documents Using Term Spectral Transforms and Multi-Dimensional Latent Semantic Representation</i><br>Haijun Zhang, Shifu Bie and Bin Luo   | 1320 |

|      |   |      |
|------|---|------|
| P329 | <i>A Hopfield Neural Network Based Algorithm for Haplotype Assembly from Low-Quality Data</i><br>Xiao Chen, Qinke Peng, Libin Han and Xiao Wang                               | 1328 |
| P330 | <i>Distributed Control for Second-Order Leader-Following Multi-Agent Systems with Heterogeneous Leader</i><br>Hongjing Liang, Yingchun Wang, Zhanshan Wang and Huaguang Zhang | 1334 |
| P331 | <i>A Multiplicative Update Algorithm for Nonnegative Convex Polyhedral Cone Learning</i><br>Qizhao Cai, Kan Xie and Zhaoshui He   | 1339 |
| P332 | <i>Neural-Based Adaptive Integral Sliding Mode Tracking Control for Nonlinear Interconnected Systems</i><br>Wen-Shyong Yu and Chien-Chih Weng                                 | 1344 |
| P333 | <i>IR Remote Sensing Image Registration Based on Multi-Scale Feature Extraction</i><br>Jun Kong, Min Jiang and Yi-Ning Sun  | 1352 |
| P334 | <i>Learning Rates of Neural Network Estimators via the New FNNs Operators</i><br>Yi Zhao and Dansheng Yu  | 1359 |
| P335 | <i>Image Encryption Based on Compressed Sensing and Blind Source Separation</i><br>Zuyuan Yang, Yong Xiang and Chuan Lu   | 1366 |
| P336 | <i>A Modular Neural Network Architecture that Selects a Different Set of Features per Module</i><br>Diogo Severo, Everson Verissimo, George Cavalcanti and Ing Ren Tsang      | 1370 |
| P337 | <i>Extracting Nonlinear Correlation for the Classification of Single-Trial EEG in a Finger Movement Task</i><br>Jun Lu, Kan Xie and Zeng Tang                                 | 1375 |
| P338 | <i>Vessel Maneuvering Model Identification Using Multi-Output Dynamic Radial-Basis-Function Networks</i><br>Ning Wang, Nuo Dong and Min Han                                   | 1380 |
| P339 | <i>Intrusion Detection Using a Cascade of Boosted Classifiers (CBC)</i><br>Mubasher Baig, El-Sayed El-Alfy and Mian Awais   | 1386 |
| P340 | <i>Data Dimensionality Reduction Approach to Improve Feature Selection Performance Using Sparsified SVD</i><br>Pengpeng Lin, Jun Zhang and Ran An                             | 1393 |
| P341 | <i>Visualization and Pattern Discovery of Social Interactions and Repost Propagation in Sina Weibo</i><br>Xuming Huang, Cong Quan, Shuwei Liu and Yuanyuan Man                | 1401 |
| P342 | <i>A Transductive Support Vector Machine with Adjustable Quasi-Linear Kernel for Semi-Supervised Data Classification</i><br>Bo Zhou, Chenlong Hu and Jinglu Hu                | 1409 |
| P343 | <i>Multi-Kernel Linear Programming Support Vector Regression with Prior Knowledge</i><br>Jinzhu Zhou  | 1416 |
| P344 | <i>An Autonomous Trader Agent for the Stock Market Based on Online Sequential Extreme Learning Machine Ensemble</i><br>Rodolfo C. Cavalcante and Adriano Oliveira             | 1424 |

**Tuesday, July 8, 4:00PM-6:00PM**

**Special Session: TuN2-1 International Workshop on Computational Energy Management in Smart Grids II, Chair: Dongbin Zhao and Haibo He, Room: 308**

|        |  |      |
|--------|--|------|
| 4:00PM | <i>Kernel Canonical Variate Analysis Based Management System for Monitoring and Diagnosing Smart Homes</i><br>Andrea Giantomassi, Francesco Ferracuti, Sabrina Iarlori, Sauro Longhi, Alessandro Fonti and Gabriele Comodi | 1432 |
| 4:20PM | <i>Frequency Control Using On-Line Learning Method for Island Smart Grid with EVs and PVs</i><br>Yufei Tang, Jun Yang, Jun Yan, Zhili Zeng and Haibo He  | 1440 |
| 4:40PM | <i>Home Energy Management Benefits Evaluation Through Fuzzy Logic Consumptions Simulator</i><br>Lucio Ciabattoni, Massimo Grisostomi, Gianluca Ippoliti and Sauro Longhi   | 1447 |

- 5:00PM *Reactive Power Control of DFIG Wind Farm Using Online Supplementary Learning Controller Based on Approximate Dynamic Programming*  
Wentao Guo, Feng Liu, Dawei He, Jennie Si, Ronald Harley and Shengwei Mei 1453
- 5:20PM *A Hierarchical Classification Algorithm for Evaluating Energy Consumption Behaviors*  
Li Bu, Dongbin Zhao, Yu Liu and Qiang Guan 1461

**Special Session: TuN2-2 Neural Networks Applied to Vision and Robotics I, Chair: Jose Garcia Rodriguez and Jorge Azorin, Room: 305A**

- 4:00PM *Augmenting the NEAT Algorithm to Improve Its Temporal Processing Capabilities*  
Pilar Caamano, Francisco Bellas and Richard Duro 1467
- 4:20PM *3D Colour Object Reconstruction Based on Growing Neural Gas*  
Sergio Orts-Escolano, Jose Garcia-Rodriguez, Vicente Morell, Miguel Cazorla and Juan Manuel Garcia-Chamizo 1474
- 4:40PM *3D Maps Representation Using GNG*  
Vicente Morell, Miguel Cazorla, Sergio Orts-Escolano and Jose Garcia-Rodriguez 1482
- 5:00PM *Intelligent Visual Servoing for Nonholonomic Mobile Robots*  
Carlos Lopez-Franco, Michel Lopez-Franco, Edgar Sanchez and Alma Y. Alanis 1488
- 5:20PM *A Predictive Model for Recognizing Human Behaviour Based on Trajectory Representation*  
Jorge Azorin-Lopez, Marcelo Saval-Calvo, Andres Fuster-Guillo and Antonio Oliver-Albert 1494
- 5:40PM *Facial Expressions Recognition System Using Bayesian Inference*  
Maninderjit Singh, Anima Majumder and Laxmidhar Behera 1502

**Special Session: TuN2-3 Autonomous Learning, Chair: Plamen Angelov and Asim Roy, Room: 305B**

- 4:00PM *A Computationally Fast Interval Type-2 Neuro-Fuzzy Inference System and Its Meta-Cognitive Projection Based Learning Algorithm*  
Ankit Kumar Das, Kartick Subramanian and Suresh Sundaram 1510
- 4:20PM *WWN: Integration with Coarse-to-Fine, Supervised and Reinforcement Learning*  
Zejia Zheng, Juyang Weng and Zhengyou Zhang 1517
- 4:40PM *From Here to AGI: A Roadmap to the Realization of Human-Level Artificial General Intelligence*  
Ben Goertzel 1525
- 5:00PM *A Fast Learning Variable Lambda TD Model Used to Realize Home Aware Robot Navigation*  
Abdulrahman Altahhan 1534
- 5:20PM *User Daily Activity Pattern Learning: A Multi-Memory Modeling Approach*  
Shan Gao and Ah-Hwee Tan 1542
- 5:40PM *Mobile Humanoid Agent with Mood Awareness for Elderly Care*  
Di Wang and Ah-Hwee Tan 1549
- 6:00PM *A New Unsupervised Approach to Fault Detection and Identification*  
Bruno Costa, Plamen Angelov and Luiz Guedes 1557

**TuN2-4 Machine Learning: Complexity and Optimization, Chair: Albert Lam, Room: 305C**

- 4:00PM *Dimensionality Reduction Assisted Tensor Clustering*  
Yanfeng Sun, Junbin Gao, Xia Hong, Yi Guo and Chris Harris 1565
- 4:20PM *Particle Swarm Optimization for Convolved Gaussian Process Models*  
Gang Cao, Edmund M-K Lai and Fakhru Alam 1573
- 4:40PM *A Flocking-Like Technique to Perform Semi-Supervised Learning*  
Roberto Gueleri, Thiago Cupertino, Andre Carvalho and Liang Zhao 1579
- 5:00PM *Finding Convex Hull Vertices in Metric Space*  
Jinhong Zhong, Ke Tang and Kai Qin 1587

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|--------|---|------|
| 5:20PM | <i>An Identifying Function Approach for Determining Structural Identifiability of Parameter Learning Machines</i><br>Zhi-Yong Ran and Bao-Gang Hu | 1593 |
| 5:40PM | <i>Detection of Non-Structural Outliers for Microarray Experiments</i><br>Zihua Yang and ZhengRong Yang   | 1600 |

#### **TuN2-5 Feature Extraction and Intelligent Systems, Chair: Sung-Bae Cho, Room: 305**

|        |   |      |
|--------|---|------|
| 4:00PM | <i>Variable Selection for Regression Problems Using Gaussian Mixture Models to Estimate Mutual Information</i><br>Emil Eirola, Amaury Lendasse and Juha Karhunen        | 1606 |
| 4:20PM | <i>Scene Image Classification Using a Wigner-Based Local Binary Patterns Descriptor</i><br>Atreyee Sinha, Sugata Banerji and Chengjun Liu                               | 1614 |
| 4:40PM | <i>Integrating Supervised Subspace Criteria with Restricted Boltzmann Machine for Feature Extraction</i><br>Guo-Sen Xie, Xu-Yao Zhang, Yan-Ming Zhang and Cheng-Lin Liu | 1622 |
| 5:00PM | <i>Semi-Supervised Sparse Coding</i><br>Jim Jing-Yan Wang and Xin Gao   | 1630 |
| 5:20PM | <i>Investigation of Multi-Layer Perceptron with Pulse Glial Chain Based on Individual Inactivity Period</i><br>Chihiro Ikuta, Yoko Uwate and Yoshifumi Nishio           | 1638 |
| 5:40PM | <i>Identification of Meat Spoilage by FTIR Spectroscopy and Neural Networks</i><br>Vassilis Kodogiannis, Ilias Petrounias and Eva Kontogianni                           | 1644 |

#### **TuN2-6 Supervised Learning II, Chair: Fakhri Karray, Room: 305E**

|        |   |      |
|--------|---|------|
| 4:00PM | <i>Max-Dependence Regression</i><br>Pouria Fewzee, Ali-Akbar Samadani, Dana Kulic and Fakhri Karray   | 1652 |
| 4:20PM | <i>K-Associated Optimal Network for Graph Embedding Dimensionality Reduction</i><br>Murillo Carneiro, Thiago Cupertino and Liang Zhao         | 1660 |
| 4:40PM | <i>Max-Margin Latent Feature Relational Models for Entity-Attribute Networks</i><br>Fei Xia, Ning Chen, Jun Zhu, Aonan Zhang and Xiaoming Jin | 1667 |
| 5:00PM | <i>Dual Instance and Attribute Weighting for Naive Bayes Classification</i><br>Jia Wu, Shirui Pan, Zhihua Cai, Xingquan Zhu and Chengqi Zhang | 1675 |
| 5:20PM | <i>Learning from Combination of Data Chunks for Multi-Class Imbalanced Data</i><br>Xu-Ying Liu and Qian-Qian Li                               | 1680 |
| 5:40PM | <i>Dual Deep Neural Network Approach to Matching Data in Different Modes</i><br>Mark Eastwood and Chrisina Jayne                              | 1688 |

### **Wednesday, July 9, 1:30PM-3:30PM**

#### **Special Session: WeN1-1 International Workshop on Computational Energy Management in Smart Grids III, Chair: Stefano Squartini and Francesco Piazza, Room: 308**

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Computational Framework Based on Task and Resource Scheduling for Micro Grid Design</i><br>Marco Severini, Stefano Squartini and Francesco Piazza  | 1695 |
| 1:50PM | <i>An Optimal Real-Time Pricing for Demand-Side Management: A Stackelberg Game and Genetic Algorithm Approach</i><br>Fan-Lin Meng and Xiao-Jun Zeng   | 1703 |
| 2:10PM | <i>A Simulation Based Approach to Forecast a Demand Load Curve for a Container Terminal Using Battery Powered Vehicles</i><br>Nico Grundmeier, Norman Ihle, Axel Hahn, Claas Meyer-Barlag and Serge Runge | 1711 |
| 2:30PM | <i>Fuzzy Power Management for Environmental Monitoring Systems in Tropical Regions</i><br>Asher G. Watts, Michal Prauzek, Petr Musilek, Emil Pelikan and Arturo Sanchez-Azofeifa                          | 1719 |

- 2:50PM *Solar Radiation Forecasting under Asymmetric Cost Functions*  
Seyyed A. Fatemi and Anthony Kuh 1727
- 3:10PM *Selection of Weighing Functions in H-infinity Controller Design Using PBIL*  
Prosser Munawa and Komla Folly 1733

**Special Session: WeN1-2 International Workshop on Advances in Learning from/with Multiple Learners, Chair: Nistor Grozavu and Guenael Cabanes, Room: 305A**

- 1:30PM *Feature Ensemble Learning Based on Sparse Autoencoders for Image Classification*  
Yaping Lu, Li Zhang, Bangjun Wang and Jiwen Yang 1739
- 1:50PM *A Review of Adaptive Feature Extraction and Classification Methods for EEG-Based Brain-Computer Interfaces*  
Shiliang Sun and Jin Zhou 1746
- 2:10PM *Diversity Analysis in Collaborative Clustering*  
Nistor Grozavu, Guenael Cabanes and Younes Bennani 1754
- 2:30PM *Solving Unbalanced Problems in Similarity Learning Using SVM Ensemble*  
Peipei Xia and Li Zhang 1762
- 2:50PM *Sharing Information on Extended Reachability Goals Over Propositionally Constrained Multi-Agent State Spaces*  
Anderson Araujo and Carlos Henrique Ribeiro 1769
- 3:10PM *A New Ensemble Method for Multi-Label Data Stream Classification in Non-Stationary Environment*  
Ge Song and Yunming Ye 1776
- 3:30PM *An  $\alpha$ -entropy of the Environmental Sustainability Index in Terms of Its Prediction and Clustering Capabilities*  
Tatiana Tambouratzis 1784

**Special Session: WeN1-3 Machine Learning for Computer Vision I, Chair: Brijesh Verma and Mohammed Bennamoun, Room: 305B**

- 1:30PM *Retinal Vessel Segmentation Based on Possibilistic Fuzzy c-means Clustering Optimised with Cuckoo Search*  
Eid Emary, Hossam Zawbaa, Aboul Ella Hassanien, Gerald Schaefer and Ahmad Taher Azar 1792
- 1:50PM *Large Margin Image Set Representation and Classification*  
Jim Jing-Yan Wang, Majed Alzahrani and Xin Gao 1797
- 2:10PM *Improving Machine Vision via Incorporating Expectation-Maximization into Deep Spatio-Temporal Learning*  
Min Jiang, Yulong Ding, Goertzel Ben, Zhongqiang Huang and Fei Chao 1804
- 2:30PM *Low-Rank Representation Based Action Recognition*  
Xiangrong Zhang, Yang Yang, Hanghua Jia, Huiyu Zhou and Licheng Jiao 1812
- 2:50PM *Interpolating Deep Spatio-Temporal Inference Network Features for Image Classification*  
Yongfeng Zhang, Changjing Shang and Qiang Shen 1819
- 3:10PM *A Study on Word-Level Multi-Script Identification from Video Frames*  
Nabin Sharma, Umapada Pal and Michael Blumenstein 1827

**WeN1-4 Intelligent Systems and Applications, Chair: Ivo Bukovsky, Room: 305C**

- 1:30PM *B-Spline Neural Network Based Single-Carrier Frequency Domain Equalization for Hammerstein Channels*  
Xia Hong, Sheng Chen and Chris Harris 1834
- 1:50PM *Coordinated Pattern Tracking of Multiple Marine Surface Vehicles with Uncertain Kinematics and Kinetics*  
Zhouhua Peng, Dan Wang, Hao Wang and Wei Wang 1842
- 2:10PM *A Real-Time Driver Identification System Based on Artificial Neural Networks and Cepstral Analysis*  
Ines del Campo, Raul Finker, Victoria Martinez, Javier Echanobe and Faiyaz Doctor 1848



- 2:30PM *An Approach to Exploit Non-Optimized Data for Efficient Control of Unknown Systems through Neural and Kernel Models*  
Cristiano Cervellera, Mauro Gaggero, Danilo Maccio and Roberto Marcialis 1856
- 2:50PM *Neural Network Approach to Hoist Deceleration Control*  
Peter Benes and Ivo Bukovsky 1864

**WeN1-5 Unsupervised Learning and Clustering I, Chair: Fuchun Sun, Room: 305D**

- 1:30PM *A Locally Adaptive Boundary Evolution Algorithm for Novelty Detection Using Level Set Methods*  
Xuemei Ding, Yuhua Li, Ammar Belatreche and Liam Maguire 1870
- 1:50PM *Tensor LRR Based Subspace Clustering*  
Yifan Fu, Junbin Gao, David Tien and Zhouchen Lin 1877
- 2:10PM *A Kernel K-Means Clustering Algorithm Based on an Adaptive Mahalanobis Kernel*  
Marcelo Ferreira and Francisco De Carvalho 1885
- 2:30PM *A New Distance Metric for Unsupervised Learning of Categorical Data*  
Hong Jia and Yiu-ming Cheung 1893
- 2:50PM *Box-Constrained Projective Nonnegative Matrix Factorization via Augmented Lagrangian Method*  
Xiang Zhang, Naiyang Guan, Long Lan, Dacheng Tao and Zhigang Luo 1900
- 3:10PM *A Survey of Distance / Similarity Measures For Categorical Data*  
Madhavi Alamuri, Bapi Raju Surampudi and Atul Negi 1907

**WeN1-6 Supervised and Semi-Supervised Learning, Chair: Marley Vellasco, Room: 305E**

- 1:30PM *Lattice Sampling for Efficient Learning with Nadaraya-Watson Local Models*  
Cristiano Cervellera, Mauro Gaggero, Danilo Maccio and Roberto Marcialis 1915
- 1:50PM *Trimmed Affine Projection Algorithms*  
Badong Chen, Xiaohan Yang, Hong Ji, Hua Qu, Nanning Zheng and Jose Principe 1923
- 2:10PM *Reconstructable Generalized Maximum Scatter Difference Discriminant Analysis*  
Kai Huang and Liqing Zhang 1929
- 2:30PM *Music Genre Classification Using On-Line Dictionary Learning*  
M. Srinivas, Debaditya Roy and C. Krishna Mohan 1937
- 2:50PM *Semi-Supervised Local-Learning-Based Feature Selection*  
Jim Jing-Yan Wang, Jin Yao and Yijun Sun 1942

**Industrial Session: WeN1-7 CI on Smart Grid and Energy Efficiency, Chair: Marco Mussetta and Timothy Havens, Room: 303**

- 1:30PM *Fault Recognition in Smart Grids by a One-Class Classification Approach*  
Enrico De Santis, Lorenzo Livi, Alireza Sadeghian and Antonello Rizzi 1949
- 1:50PM *Hybrid Model Analysis and Validation for PV Energy Production Forecasting*  
Alessandro Gandelli, Francesco Grimaccia, Sonia Leva, Marco Mussetta and Emanuele Ogliari 1957
- 2:10PM *Personalized Sensing towards Building Energy Efficiency and Thermal Comfort*  
Huafen Hu, Yonghong Huang, Milan Milenkovic, Chad Miller and Ulf Hanebutte 1963
- 2:30PM *A Supervised Approach to Electric Tower Detection and Classification for Power Line Inspection*  
Carlos Sampedro, Carol Martinez, Aneesh Chauhan and Pascual Campoy 1970
- 2:50PM *Random Forest Based Adaptive Non-Intrusive Load Monitoring*  
Jie Mei, Dawei He, Ronald Harley and Thomas Habetler 1978

## Wednesday, July 9, 3:30PM-6:00PM

### Poster Session: PN3 Poster Session 3, Chair: Manuel Roveri, Room: Posters Area (Level 3)

- |      |   |      |
|------|---|------|
| P501 | <i>An Implementation of the Path Integrator Mechanism of Head Direction Cells for Bio-Mimetic Navigation</i><br>Ankur Sinha and Jack Wang   | 1984 |
| P502 | <i>A Legged Central Pattern Generation Model for Autonomous Gait Transition.</i><br>Zhijun Yang, Rocha Marlon, Lima Priscila, Karamanoglu Mehmet and Franca Felipe  | 1992 |
| P503 | <i>An Algorithm for Real-Time Object Tracking in Complex Environment</i><br>Dongxu Gao, Jiangtao Cao and Zhaojie Ju   | 1996 |
| P504 | <i>Robust Prediction in Nearly Periodic Time Series Using Motifs</i><br>Woon Huei Chai, Hongliang Guo and Shen-Shyang Ho  | 2003 |
| P505 | <i>A Hybrid Coupled k-Nearest Neighbor Algorithm on Imbalance Data</i><br>Chunming Liu, Longbing Cao and Philip S Yu  | 2011 |
| P506 | <i>A Consensus-Based Semi-Supervised Growing Neural Gas</i><br>Vinicius Maximo, Marcos Quiles and Maria Nascimento  | 2019 |
| P507 | <i>Bio-Inspired Architecture for a Reactive-Deliberative Robot Controller</i><br>Fabian Rubilar, Maria-Jose Escobar and Tomas Arredondo   | 2027 |
| P508 | <i>Improved Keyword Spotting System by Optimizing Posterior Confidence Measure Vector Using Feed-Forward Neural Network</i><br>Yuchen Liu, Mingxing Xu and Lianhong Cai                                   | 2036 |
| P509 | <i>Agglomerative Clustering of Defects in Ultrasonic Non-Destructive Testing Using Hierarchical Mixtures of Independent Component Analyzers</i><br>Addisson Salazar, Jorge Igual and Luis Vergara         | 2042 |
| P510 | <i>Completed Hybrid Local Binary Pattern for Texture Classification</i><br>Jing-Hua Yuan, Hao-Dong Zhu, Yong Gan and De-Shuang Huang  | 2050 |
| P511 | <i>Pitch Estimation Using Non-Negative Matrix Factorization</i><br>Ryan Burt, Goktug Cinar and Jose Principe  | 2058 |
| P512 | <i>On the Dynamics of the High Order Type of Neural Networks with Time Varying Coefficients and Mixed Delay</i><br>Hajer Brahmi, Boudour Ammar, Farouk Cherif and Adel M. Alimi                           | 2063 |
| P513 | <i>DL-Pro: A Novel Deep Learning Method for Protein Model Quality Assessment</i><br>Son Nguyen, Yi Shang and Dong Xu  | 2071 |
| P514 | <i>Mimicking the Worm - An Adaptive Spiking Neural Circuit for Contour Tracking Inspired by C. Elegans Thermotaxis</i><br>Ashish Bora, Arjun Rao and Bipin Rajendran                                      | 2079 |
| P515 | <i>Neural Approach for Bearing Fault Classification in Induction Motors by Using Motor Current and Voltage</i><br>W. F. Godoy, I. N. da Silva, A. Goedtel, R. H. C. Palacios and W. S. Gongora            | 2087 |
| P516 | <i>Efficient Class Incremental Learning for Multi-Label Classification of Evolving Data Streams</i><br>Zhongwei Shi, Yimin Wen and Yun Xue  | 2093 |
| P517 | <i>Probabilistic Point Set Matching with Gaussian Mixture Model</i><br>Han-Bing Qu and Jia-Qiang Wang   | 2100 |
| P518 | <i>EEG Analysis for Cognitive Failure Detection in Driving Using Neuro-Evolutionary Synergism</i><br>Anuradha Saha, Amit Konar, Ritambhar Burman and Atulya Nagar   | 2108 |
| P519 | <i>Multi-Objective Optimization of a Hybrid Model for Network Traffic Classification by Combining Machine Learning Techniques</i><br>Zuleika Nascimento, Djamel Sadok, Stenio Fernandes and Judith Kelner | 2116 |

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|------|--|------|
| P520 | <i>Learning Motion-Difference Features Using Gaussian Restricted Boltzmann Machines for Efficient Human Action Recognition</i>                   |      |
|      | Tran Son, Benetos Emmanouil and Garcez Artur   | 2123 |
| P521 | <i>Color Image Processing Based on Nonnegative Matrix Factorization with Convolutional Neural Network</i>  |      |
|      | Thanh Xuan Luong, Bo-Kyeong Kim and Soo-Young Lee  | 2130 |
| P522 | <i>Bottom-Up Model of Visual Saliency: A Viewpoint Based on Efficient Coding Hypothesis</i>  |      |
|      | Hao Zhu and Biao Han   | 2136 |
| P523 | <i>Using Self-Organizing Incremental Neural Network (SOINN) for Radial Basis Function Networks</i>   |      |
|      | Jie Lu, Furao Shen and Jinxi Zhao  | 2142 |
| P524 | <i>A New Multi-Task Learning Based Wi-Fi Location Approach Using <math>L_{1/2}</math>-Norm</i>   |      |
|      | Wentao Mao, Haicheng Wang and Shangwang Liu  | 2149 |
| P525 | <i>A Combined Model for Scan Path in Pedestrian Searching</i>  |      |
|      | Lijuan Duan, Zeming Zhao, Wei Ma, Jili Gu, Yuanhua Qiao and Zhen Yang  | 2156 |
| P526 | <i>Gain Parameters Based Complex-Valued BackPropagation Algorithm for Learning and Recognizing Hand Gestures</i>                                 |      |
|      | Yuanshan Liu, He Huang and Tingwen Huang   | 2162 |
| P527 | <i>Tension Identification of Two-Motor System Based on Neural Network Left-Inverse</i>   |      |
|      | Guohai Liu, Zhennan Cai, Wenxiang Zhao, Hao Zhang, Yan Jiang and Yaojie Mi   | 2167 |
| P528 | <i>Sideslip Angle Soft-Sensor Based on Neural Network Left Inversion for Multi-Wheel Independently Driven Electric Vehicles</i>                  |      |
|      | Penghu Miao, Guohai Liu, Duo Zhang, Yan Jiang, Hao Zhang and Huawei Zhou   | 2171 |
| P529 | <i>Fast Support Vector Data Description Training Using Edge Detection on Large Datasets</i>  |      |
|      | Chenlong Hu, Bo Zhou and Jinglu Hu   | 2176 |
| P530 | <i>A Half-Split Grid Clustering Algorithm by Simulating Cell Division</i>  |      |
|      | Wenxiang Dou and Jinglu Hu   | 2183 |
| P531 | <i>Stochastic Gradient Based Iterative Identification Algorithm for a Class of Dual-Rate Wiener Systems</i>                                      |      |
|      | Jing Leng, Junpeng Li, Changchun Hua and Xinpeng Guan  | 2190 |
| P532 | <i>Wiener Model Identification of Blast Furnace Ironmaking Process Based on Laguerre Filter and Linear Programming Support Vector Regression</i> |      |
|      | Xia Xu, Changchun Hua, Yinggan Tang and Xinpeng Guan   | 2198 |
| P533 | <i>Learning Features from High Speed Train Vibration Signals with Deep Belief Networks</i>   |      |
|      | Jipeng Xie, Yan Yang, Tianli Li and Weidong Jin  | 2205 |
| P534 | <i>A Neural Network and SOM Based Approach to Analyse Periodic Signals: Application to Oyster Heart-Rate Data</i>                                |      |
|      | Andrew Hellicar, Ashfaqur Rahman, Daniel Smith, Greg Smith and John McCulloch  | 2211 |
| P535 | <i>Bayesian Network Scores Based Text Localization in Scene Images</i>   |      |
|      | Khalid Iqbal, Xu-Cheng Yin, Hong-Wei Hao, Sohail Asghar and Hazrat Ali   | 2218 |
| P536 | <i>Implementation of Memristive Neural Networks with Spike-Rate-Dependent Plasticity Synapses</i>  |      |
|      | Yide Zhang, Zhigang Zeng and Shiping Wen   | 2226 |
| P537 | <i>Evaluation of Active Position Detection in Vehicular Ad Hoc Networks</i>  |      |
|      | Kiran Penna, Venkatesh Yalavarthi, Huirong Fu and Ye Zhu   | 2234 |
| P538 | <i>Smart Bandwidth Management Using a Recurrent Neuro-Evolutionary Technique</i>   |      |
|      | Rabia Arshad, Gul Muhammad Khan and Sahibzada Ali Mahmud   | 2240 |
| P539 | <i>Analog Memristive Time Dependent Learning Using Discrete Nanoscale RRAM Devices</i>   |      |
|      | Aniket Singha, Bhaskaran Muralidharan and Bipin Rajendran  | 2248 |
| P540 | <i>Data Intensive Parallel Feature Selection Method Study</i>  |      |
|      | Zhanquan Sun and Zhao Li   | 2256 |
| P541 | <i>Kernel Ridge Regression Classification</i>  |      |
|      | Jinrong He, Lixin Ding, Lei Jiang and Ling Ma  | 2263 |

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|------|--|------|
| P542 | <i>Causality Traces for Retrospective Learning in Neural Networks - Introduction of Parallel and Subjective Time Scales</i><br>Katsunari Shibata | 2268 |
| P543 | <i>Hardware Implementation of KLMS Algorithm Using FPGA</i><br>Xiaowei Ren, Pengju Ren, Badong Chen, Tai Min and Nanning Zheng                   | 2276 |
| P544 | <i>Parallelized Neural Networks as a Service</i><br>Altaf Ahmad Huqqani, Erich Schikuta and Erwin Mann   | 2282 |

### Wednesday, July 9, 4:00PM-6:00PM

#### Special Session: WeN2-2 Learning and Optimization in Multi-criteria Dynamic and Uncertain Environments, Chair: Madalina Drugan and Peter Vrancx, Room: 305A

|        |   |      |
|--------|---|------|
| 4:00PM | <i>The Scalarized Multi-Objective Multi-Armed Bandit Problem: An Empirical Study of Its Exploration vs. Exploitation Tradeoff</i><br>Saba Yahyaa, Madalina Drugan and Bernard Manderick             | 2290 |
| 4:20PM | <i>Accelerating Learning in Multi-Objective Systems through Transfer Learning</i><br>Adam Taylor, Ivana Dusparic, Edgar Galvan-Lopez, Siobhan Clarke and Vinny Cahill                               | 2298 |
| 4:40PM | <i>A Novel Adaptive Weight Selection Algorithm for Multi-Objective Multi-Agent Reinforcement Learning</i><br>Kristof Van Moffaert, Tim Brys, Arjun Chandra, Lukas Esterle, Peter Lewis and Ann Nowe | 2306 |
| 5:00PM | <i>Multi-Objectivization of Reinforcement Learning Problems by Reward Shaping</i><br>Tim Brys, Anna Harutyunyan, Peter Vrancx, Matthew E. Taylor, Daniel Kudenko and Ann Nowe                       | 2315 |
| 5:20PM | <i>Policy Gradient Approaches for Multi-Objective Sequential Decision Making</i><br>Simone Parisi, Matteo Pirota, Nicola Smacchia, Luca Bascetta and Marcello Restelli                              | 2323 |
| 5:40PM | <i>Multi-Objective X-Armed Bandits</i><br>Kristof Van Moffaert, Kevin Van Vaerenbergh, Peter Vrancx and Ann Nowe  | 2331 |

#### Special Session: WeN2-3 Machine Learning for Computer Vision II, Chair: Brijesh Verma and Mohammed Bennamoun, Room: 305B

|        |  |      |
|--------|--|------|
| 4:00PM | <i>An Interpretable Graph-Based Image Classifier</i><br>Filippo Maria Bianchi, Simone Scardapane, Lorenzo Livi, Aurelio Uncini and Antonello Rizzi                                     | 2339 |
| 4:20PM | <i>Off-Line Handwritten Thai Name Recognition for Student Identification in an Automated Assessment System</i><br>Hemmaphan Suwanwivat, Michael Blumenstein, Vu Nguyen and Umapada Pal | 2347 |
| 4:40PM | <i>Feature Extraction in X-Ray Images for Hazelnuts Classification</i><br>Khosa Ikramullah and Eros Pasero   | 2354 |
| 5:00PM | <i>A New Fuzzy Shape Context Approach Based on Multi-Clue and State Reservoir Computing</i><br>Zhidong Deng, Kelaiti Xiao and Jing Huang   | 2361 |
| 5:20PM | <i>Structure-from-Motion Reconstruction Based on Weighted Hamming Descriptors</i><br>Guoyu Lu, Vincent Ly and Chandra Kambhmettu   | 2367 |
| 5:40PM | <i>Local Binary Pattern Based Facial Expression Recognition Using Self-Organizing Map</i><br>Anima Majumder, Laxmidhar Behera and Venkatesh K. Subramanian                             | 2375 |

#### WeN2-4 Spiking Neural Networks I, Chair: Nikola Kasabov and Nathan Scott, Room: 305C

|        |   |      |
|--------|---|------|
| 4:00PM | <i>Does Plasticity Promote Criticality ?</i><br>Filipe Peliz Pinto Teixeira and Murray Shanahan   | 2383 |
| 4:20PM | <i>Evolutionary Features and Parameter Optimization of Spiking Neural Networks for Unsupervised Learning</i><br>Marco Silva, Adriano Koshiyama, Marley Vellasco and Edson Cataldo | 2391 |
| 4:40PM | <i>Stochastic Spiking Neural Networks at the Edge of Chaos</i><br>J.L. Rossello, V. Canals, A. Oliver and A. Morro  | 2399 |

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|--------|--|------|
| 5:00PM | <i>Phase Offset Between Slow Oscillatory Cortical Inputs Influences Competition in a Model of the Basal Ganglia</i><br>Zafeirios Fountas and Murray Shanahan | 2407 |
| 5:20PM | <i>A Sequential Learning Algorithm for a Minimal Spiking Neural Network (MSNN) Classifier</i><br>Shirin Dora, Sundaram Suresh and Narasimhan Sundararajan    | 2415 |
| 5:40PM | <i>Large Scale Parameter Estimation of Nonlinear Dynamic Systems: Application on Spike-In, Spike-Out Neural Models</i><br>Alireza Dibazar                    | 2422 |

#### **WeN2-5 Unsupervised Learning and Clustering II, Chair: Akira Hirose, Room: 305D**

|        |   |      |
|--------|---|------|
| 4:00PM | <i>An Unsupervised Material Learning Method for Imaging Spectroscopy</i><br>Johannes Jordan, Elli Angelopoulou and Antonio Robles-Kelly | 2428 |
| 4:20PM | <i>Optimal Reduced Set for Sparse Kernel Spectral Clustering</i><br>Raghvendra Mall, Siamak Mehrkanon, Rocco Langone and Johan Suykens  | 2436 |
| 4:40PM | <i>An Efficient Parallel ISODATA Algorithm Based on Kepler GPUs</i><br>Shiquan Yang, Jianqiang Dong and Bo Yuan                         | 2444 |
| 5:00PM | <i>Semi-Supervised Clustering with Pairwise and Size Constraints</i><br>Shaohong Zhang, Hau-San Wong and Dongqing Xie                   | 2450 |
| 5:20PM | <i>Multivariate Multi-Scale Gaussian for Microarray Unsupervised Classification</i><br>Amelia King, Zihua Yang and ZhengRong Yang       | 2458 |
| 5:40PM | <i>Hierarchical Linear Dynamical Systems: A New Model for Clustering of Time Series</i><br>Goktug Cinar, Carlos Loza and Jose Principe  | 2464 |

#### **WeN2-6 Dynamics of Neural Systems, Chair: Zhanshan Wang, Room: 305E**

|        |  |      |
|--------|--|------|
| 4:00PM | <i>A Review on Evolution of Lyapunov-Krasovskii Function in Stability Analysis of Recurrent Neural Networks with Single Time-Varying Delay</i><br>Zhanshan Wang, Zhenwei Shen, Mi Tian and Qihe Shan | 2471 |
| 4:20PM | <i>Stability of Hopfield Neural Networks with Event-Triggered Feedbacks</i><br>Xinlei Yi, Wenlian Lu and Tianping Chen   | 2477 |
| 4:40PM | <i>Nonlinear Responses of an Asynchronous Cellular Automaton Model of Spiral Ganglion Cells</i><br>Masato Izawa and Hiroyuki Torikai   | 2483 |
| 5:00PM | <i>New Method on the Complete Stability of Delayed Cellular Neural Networks</i><br>Lili Wang and Tianping Chen   | 2491 |
| 5:20PM | <i>Reproduction of Forward and Backward Propagations on Dendrites by Multi-Compartment Asynchronous Cell Automaton Neuron</i><br>Naoki Shimada and Hiroyuki Torikai                                  | 2496 |
| 5:40PM | <i>Phase Cone Detection Optimization in EEG Data</i><br>Mark Myers, Robert Kozma and Roman Ilin  | 2504 |

#### **Industrial Session: WeN2-7 CI on Control Systems, Chair: Ruben Morales-Menendez and Aguilar Jose, Room: 303**

|        |   |      |
|--------|---|------|
| 4:00PM | <i>Experimental ANN-Based Modeling of an Adjustable Damper</i><br>Juan Carlos Tudon-Martinez, Ruben Morales-Menendez, Ricardo A Ramirez-Mendoza and Luis E Garza-Castanon | 2512 |
| 4:20PM | <i>Scaling-Up Action Learning Neuro-Controllers with GPUs</i><br>Martin Peniak and Angelo Cangelosi   | 2519 |
| 4:40PM | <i>Application of Genetic Algorithms to Neural Networks Based Control of a Liquid Level Tank System</i><br>Kristina Vassiljeva, Juri Belikov and Eduard Petlenkov         | 2525 |
| 5:00PM | <i>Dynamic Neural Networks for Jet Engine Degradation Prediction and Prognosis</i><br>S. Kiakojoori and K. Khorasani  | 2531 |

|        |  |      |
|--------|--|------|
| 5:20PM | <i>Exploiting Homophily-Based Implicit Social Network to Improve Recommendation Performance</i><br>Tong Zhao, Junjie Hu, Pinjia He, Hang Fan, Irwin King and Michael Lyu | 2539 |
| 5:40PM | <i>Anomaly Detection Based on Indicators Aggregation</i><br>Tsirizo Rabenoro, Jerome Lacaille, Marie Cottrell and Fabrice Rossi  | 2548 |
| 6:00PM | <i>Mixture Modeling and Inference for Recognition of Multiple Recurring Unknown Patterns</i><br>Zeyu You, Raviv Raich and Yonghong Huang                                 | 2556 |
| 6:20PM | <i>Recognition of Sintering State in Rotary Kiln Using a Robust Extreme Learning Machine</i><br>Hua Chen, Jing Zhang, Xiaogang Zhang and HongPing Hu                     | 2564 |

### Thursday, July 10, 1:30PM-3:30PM

#### Special Session: ThN1-1 Architectures and Theories of the Brain, Chair: Asim Roy, Room: 308

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Reliable Object Recognition by Using Cooperative Neural Agents</i><br>Oscar Chang  | 2571 |
| 1:50PM | <i>A Nonlinear Model of fMRI BOLD Signal Including the Trend Component</i><br>Takashi Matsubara, Hiroyuki Torikai, Tetsuya Shimokawa, Kenji Leibnitz and Ferdinand Peper  | 2579 |
| 2:10PM | <i>How Might the Brain Represent Complex Symbolic Knowledge?</i><br>Ben Goertzel  | 2587 |
| 2:30PM | <i>Statistical Approach for Reconstruction of Dynamic Brain Dipoles Based on EEG Data</i><br>Petia Georgieva, Filipe Silva, Lyudmila Mihaylova and Nidhal Bouaynaya   | 2592 |
| 2:50PM | <i>Design of the First Neural Connectomics Challenge: From Imaging to Connectivity</i><br>Isabelle Guyon, Demian Battaglia, Alice Guyon, Javier Orlandi, Mehreen Saeed, Jordi Soriano Fradera, Alexander Statnikov and Olav Stetter | 2600 |
| 3:10PM | <i>A Bridge-Islands Model for Brains: Developing Numeric Circuits for Logic and Motivation</i><br>Juyang Weng   | 2608 |

#### Special Session: ThN1-2 Hybrid Neural Intelligent Systems, Chair: Patricia Melin, Room: 305A

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Selecting and Combining Models with Self-Organizing Maps for Long-Term Forecasting of Chaotic Time Series</i><br>Rigoberto Fonseca-Delgado and Pilar Gomez-Gil | 2616 |
| 1:50PM | <i>Impulsive Synchronization of Coupled Switched Neural Networks with Impulsive Time Window</i><br>Xin Wang, Chuandong Li, Tingwen Huang and Xiaofeng Liao        | 2624 |
| 2:10PM | <i>Vibrate Synchronizing Function Neural Network Model - Its Backgrounds</i><br>Yoshitsugu Kakemoto and Shinichi Nakasuka   | 2629 |
| 2:30PM | <i>Neural Networks for Runtime Verification</i><br>Alan Perotti, Artur d'Avila Garcez and Guido Boella  | 2637 |

#### Special Session: ThN1-3 Ensemble Systems and Machine Learning, Chair: Marley Vellasco and Teresa Ludermir, Room: 305B

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Towards Generating Random Forests via Extremely Randomized Trees</i><br>Le Zhang, Ye Ren and P. N. Suganthan   | 2645 |
| 1:50PM | <i>Reservoir Computing Optimization with a Hybrid Method</i><br>Anderson Sergio and Teresa Ludermir   | 2653 |
| 2:10PM | <i>An Empirical Analysis of Ensemble Systems in Cancellable Behavioural Biometrics: A Touch Screen Dataset</i><br>Marcelo Damasceno de Melo and Anne Canuto | 2661 |
| 2:30PM | <i>Ensemble Learning for Keyword Extraction from Event Descriptions</i><br>Pedro Geadas, Ana Alves and Bernardete Ribeiro                                   | 2669 |

- 2:50PM *Ensembles Of Evolutionary Extreme Learning Machines through Differential Evolution and Fitness Sharing*  
Tiago Lima and Teresa Ludermir 2677

#### ThN1-4 Reinforcement and Hybrid Learning, Chair: Huaguang Zhang, Room: 305C

- 1:30PM *Unmanned Aerial Vehicles (UAV) Heading Optimal Tracking Control Using Online Kernel-Based HDP Algorithm*  
Fuxiao Tan, Derong Liu, Xiping Guan and Bin Luo 2683
- 1:50PM *Scalarization-Based Pareto Optimal Set of Arms Identification Algorithms*  
Madalina Drugan and Ann Nowe 2690
- 2:10PM *Approximate Model-Assisted Neural Fitted Q-Iteration*  
Thomas Lampe and Martin Riedmiller 2698
- 2:30PM *Explore to See, Learn to Perceive, Get the Actions for Free: SKILLABILITY*  
Varun Kompella, Marijn Stollenga, Matthew Luciw and Juergen Schmidhuber 2705
- 2:50PM *Correntropy Kernel Temporal Differences for Reinforcement Learning Brain Machine Interfaces*  
Jihye Bae, Luis Sanchez Giraldo, Joseph Francis and Jose Principe 2713
- 3:10PM *PROPRE: PROjection and PREDiction for Multimodal Correlations Learning. An Application to Pedestrians Visual Data Discrimination.*  
Mathieu Lefort and Alexander Gepperth 2718

#### ThN1-5 Models of Perception, Cognition and Coordination, Chair: Leonid Perlovsky, Room: 305D

- 1:30PM *Pinning Dynamic Complex Networks by Time-Varying Controller-Vertex Set*  
Yujuan Han, Wenlian Lu and Tianping Chen 2726
- 1:50PM *Distributed LQR Design for Multi-Agent Systems on Directed Graph Topologies*  
Tao Feng, Huaguang Zhang, Yanhong Luo and Yingchun Wang 2732
- 2:10PM *Impact of Ratio  $k$  on Two-Layer Neural Network with Dynamic Optimal Learning Rate*  
Tong Zhang and C. L. Philip Chen 2738
- 2:30PM *A Neural Model of Mentalization/Mindful Based Psychotherapy*  
Abbas Edalat and Lin Zheng 2743
- 2:50PM *Incremental Face Recognition Using Rehearsal and Recall Processes*  
Sangwook Kim, Mallipeddi Rammohan and Lee Minho 2752
- 3:10PM *On the Relationships Between Social Structures and Acquired Knowledge in Societies*  
Toshihiko Matsuka and Hidehito Honda 2758

#### ThN1-6 Recurrent Neural Networks, Chair: Yunong Zhang, Room: 305E

- 1:30PM *Case Study of Zhang Matrix Inverse for Different ZFs Leading to Different Nets*  
Dongsheng Guo, Binbin Qiu, Zhende Ke, Zhi Yang and Yunong Zhang 2764
- 1:50PM *Neurodynamics-Based Robust Eigenstructure Assignment for Second-Order Descriptor Systems*  
Xinyi Le, Zheng Yan and Jun Wang 2770
- 2:10PM *Oscillation Analysis of the Solutions for a Four Coupled FHN Network Model with Delays*  
Chunhua Feng and Rejean Plamondon 2776
- 2:30PM *Ideal Modified Adachi Chaotic Neural Networks and Active Shape Model for Infant Facial Cry Detection on Still Image*  
Yosi Kristian, Mochamad Hariadi and Mauridhi Hery Purnomo 2783
- 2:50PM *Three New ZNN Models with Economical Dimension and Exponential Convergence for Real-Time Solution of Moore-Penrose Pseudoinverse*  
Chen Peng, Yingbiao Ling, Ying Wang, Xiaotian Yu and Yunong Zhang 2788
- 3:10PM *A Recurrent Neural Network for Real Time Electrical Microgrid Prototype Optimization*  
Juan Diego Sanchez-Torres, Martin J. Loza-Lopez, Riemann Ruiz-Cruz, Edgar Sanchez and Alexander G. Loukianov 2794

## Thursday, July 10, 3:30PM-6:00P

### Poster Session: PN4 Poster Session 4, Chair: Pablo Estevez, Room: Posters Area (Level 3)

|      |   |      |
|------|---|------|
| P701 | <i>Compressive Direction-of-Arrival Estimation via Regularized Multiple Measurement FOCUSS Algorithm</i><br>Shuyuan Yang, Min Wang and Bin Li                               | 2800 |
| P702 | <i>Effective Identification of a Turbogenerator in a SMIB Power System Using Fuzzy Neural Networks</i><br>Wissam A. Albukhanajer, Hussein A. Lefta and Abduladhem A. Ali    | 2804 |
| P703 | <i>Multi-Agent Systems Applied to Topological Reconfiguration of Smart Power Distribution Systems</i><br>Filipe Saraiva and Eduardo Asada                                   | 2812 |
| P704 | <i>Heuristically Enhanced Dynamic Neural Networks for Structurally Improving Photovoltaic Power Forecasting</i><br>Naji Al-Messabi, Cindy Goh, Ibrahim El-Amin and Yun Li   | 2820 |
| P705 | <i>Data Mining Paradigm Based on Functional Networks with Applications in Landslide Prediction</i><br>Ailong Wu, Zhigang Zeng and Chaojin Fu                                | 2826 |
| P706 | <i>The State of the Art of Memristive Neural Systems: Models and Applications</i><br>Ailong Wu, Zhigang Zeng and Chaojin Fu   | 2831 |
| P707 | <i>Integrating Local and Global Manifold Structures for Unsupervised Dimensionality Reduction</i><br>Xiaochen Chen, Jia Wei, Jinhai Li and Xiaodong Zhang                   | 2837 |
| P708 | <i>Moving Towards Accurate Monitoring and Prediction of Gold Mine Underground Dam Levels</i><br>Ali Hasan and Bhekisipho Twala  | 2844 |
| P709 | <i>Convolutional Deep Belief Networks for Feature Extraction of EEG Signal</i><br>Yuanfang Ren and Yan Wu   | 2850 |
| P710 | <i>Newton's Method Backpropagation for Complex-Valued Holomorphic Multilayer Perceptrons</i><br>Diana La Corte and Yi Ming Zou  | 2854 |
| P711 | <i>Fuzzy c-Means Clustering with a New Regularization Term for Image Segmentation</i><br>Guangpu Shao   | 2862 |
| P712 | <i>Direct Adaptive Neural Network Control of a Class of Nonlinear Systems</i><br>Baobin Miao and Tieshan Li   | 2870 |
| P713 | <i>Hybrid SVM/HMM Architectures for Statistical Model-Based Voice Activity Detection</i><br>YingWei Tan, WenJu Liu, Wei Jiang and Hao Zheng                                 | 2875 |
| P714 | <i>Novel Stability Criteria of T-S Fuzzy Hopfield Neural Networks with Time-Varying Delays and Uncertainties</i><br>Caigen Zhou, Xiaoqin Zeng and Jianjiang Yu              | 2879 |
| P715 | <i>A Collaborative Filtering Framework Based on Local and Global Similarities with Similarity Tie-Breaking Criteria</i><br>Andre Lopes, Ricardo Prudencio and Byron Bezerra | 2887 |
| P716 | <i>SVM Classification for Imbalanced Data Sets Using Conformal Kernel Transformations</i><br>Yong Zhang, Panpan Fu and Wenzhe Liu   | 2894 |
| P717 | <i>Analysis of Disease Association and Susceptibility for SNP Data Using Emotional Neural Networks</i><br>Xiao Wang, Qinke Peng and Tao Zhong                               | 2901 |
| P718 | <i>Artificial Immune System Application for Solving Dynamic Optimization Problems</i><br>Zhijie Li, Yuanxiang Li, Kuang Li and Fei Yu                                       | 2906 |
| P719 | <i>Synchronization Control of Hybrid-Coupled Heterogeneous Complex Networks</i><br>Jianqiang Hu, Jinling Liang and Jinde Cao  | 2912 |
| P720 | <i>Robust LS-SVR Based on Variational Bayesian and Its Applications</i><br>Kefeng Ning, Min Liu, Mingyu Dong and Zhansong Wu  | 2920 |
| P721 | <i>Label Propagation and Soft-Similarity Measure for Graph Based Constrained Semi-Supervised Learning</i><br>Zhao Zhang, Mingbo Zhao and Tommy W.S. Chow                    | 2927 |



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|------|---|------|
| P722 | <i>An Improved RBM Based on Bayesian Regularization</i><br>Guangyuan Pan and Junfei Qiao  | 2935 |
| P723 | <i>On the Cooperative Observability of a Continuous-Time Linear System on an Undirected Network</i><br>Henghui Zhu, Kexin Liu, Jinhua Lu, Zongli Lin and Yao Chen                                   | 2940 |
| P724 | <i>Robust Bilinear Matrix Recovery by Tensor Low-Rank Representation</i><br>Zhao Zhang and Mingbo Zhao  | 2945 |
| P725 | <i>Using Chou's Amphiphilic Pseudo-Amino Acid Composition and Extreme Learning Machine for Prediction of Protein-Protein Interactions</i><br>Qiao-Ying Huang, Zhu-Hong You, Shuai Li and Zexuan Zhu | 2952 |
| P726 | <i>Joint Multiple Dictionary Learning for Tensor Sparse Coding</i><br>Yifan Fu, Junbin Gao, Yanfeng Sun and Xia Hong  | 2957 |
| P727 | <i>Dependent Stochastic Blockmodels</i><br>Eunsil Gim, Juho Lee and Seungjin Choi   | 2965 |
| P728 | <i>Splitted Neural Networks for Better Performance of Antenna Optimization</i><br>Linh Ho Manh, Francesco Grimaccia, Marco Mussetta and Riccardo E. Zich  | 2973 |
| P729 | <i>Learning Features with Structure-Adapting Multi-View Exponential Family Harmoniums</i><br>Kang Yoonseop and Choi Seungjin  | 2978 |
| P730 | <i>Outdoor Scene Understanding Using SEVI-BOVW Model</i><br>Haibing Zhang, Shirong Liu and Chaoliang Zhong  | 2986 |
| P731 | <i>Global Exponential Stability of Delayed Hopfield Neural Network on Time Scale</i><br>Xuehui Mei and Haijun Jiang   | 2991 |
| P732 | <i>Application of Neural Networks to Evaluate Experimental Data of Galvanic Zincing</i><br>Peter Michal, Jan Pitel, Alena Vagaska and Ivo Bukovsky  | 2997 |
| P733 | <i>Iris Liveness Detection Methods in the Mobile Biometrics Scenario</i><br>Ana F. Sequeira, Juliano Murari and Jaime S. Cardoso  | 3002 |
| P734 | <i>Nonnegative Shifted Tensor Factorization in Time Frequency Domain</i><br>Qiang Wu, Ju Liu, Fengrong Sun, Jie Li and Andrzej Cichocki   | 3009 |
| P735 | <i>Modeling of Vertical Mill Raw Meal Grinding Process and Optimal Setting of Operating Parameters Based on Wavelet Neural Network</i><br>Xiaofeng Lin and Zhe Qian                                 | 3015 |
| P736 | <i>Kernel Robust Mixed-Norm Adaptive Filtering</i><br>Jin Liu, Hua Qu, Badong Chen and Wentao Ma  | 3021 |
| P737 | <i>Soft-Constrained Nonnegative Matrix Factorization via Normalization</i><br>Long Lan, Naiyang Guan, Xiang Zhang, Dacheng Tao and Zhigang Luo  | 3025 |
| P738 | <i>Latency-Based Probabilistic Information Processing in a Learning Feedback Hierarchy</i><br>Alexander Gepperth  | 3031 |
| P739 | <i>Improving the Genetic-Algorithm-Optimized Wavelet Neural Network for Stock Market Prediction</i><br>Yu Fang, Kamaladdin Fataliyev, Lipo Wang, Xiujia Fu and Yaoli Wang                           | 3038 |
| P740 | <i>Optimal Software Maintenance Policy Based on Reliability and Risk</i><br>Xiaoping Wang, Fang Zhou and Yi Shen  | 3043 |
| P741 | <i>Forecasting Electricity Consumption in South Africa: ARMA, Neural Networks and Neuro-Fuzzy Systems</i><br>Lufuno Marwala and Twala Bhekisipho  | 3049 |
| P742 | <i>PVis - Partitions' Visualizer: Extracting Knowledge by Visualizing a Collection of Partitions</i><br>Katti Faceli, Tiemi Sakata, Andre Carvalho and Marcilio de Souto                            | 3056 |

**Thursday, July 10, 4:00PM-6:00PM****Special Session: ThN2-1 Applications of Neural Networks for Financial Modeling and Forecasting, Chair: Massimo Panella, Room: 308**

|        |   |      |
|--------|---|------|
| 4:00PM | <i>Adaptively Weighted Support Vector Regression for Financial Time Series Prediction</i><br>Zhijie Li, Yuanxiang Li, Fei Yu and Dahai Ge     | 3062 |
| 4:20PM | <i>A Higher-Order Fuzzy Neural Network for Modeling Financial Time Series</i><br>Massimo Panella, Luca Liparulo and Andrea Proietti           | 3066 |
| 4:40PM | <i>Beating The S-and-P 500 Index - A Successful Neural Network Approach</i><br>Mininder Sethi, Philip Treleaven and Sebastian Del Bano Rollin | 3074 |
| 5:00PM | <i>Stock Volatility Prediction Using Multi-Kernel Based Extreme Learning Machine</i><br>Feng Wang, Zhiyong Zhao, Xiaodong Li and Fei Yu       | 3078 |
| 5:20PM | <i>Augmented Neural Networks for Modelling Consumer Indebtness</i><br>Alexandros Ladas, Jon Garibaldi, Rodrigo Scarpel and Uwe Aickelin       | 3086 |
| 5:40PM | <i>A New Investment Strategy Based on Data Mining and Neural Networks</i><br>Chang Liu and Hafiz Malik  | 3094 |

**Special Session: ThN2-2 Incremental Machine Learning: Methods and Applications, Chair: Nicoleta Rogovschi and Nistor Grozavu, Room: 305A**

|        |  |      |
|--------|--|------|
| 4:00PM | <i>Locally Linear Embedding Algorithm Based on OMP for Incremental Learning</i><br>Yiqin Leng, Li Zhang and Jiwen Yang   | 3100 |
| 4:20PM | <i>Hidden Markov Models Based Dynamic Hand Gesture Recognition with Incremental Learning Method</i><br>Meng Hu, Furao Shen and Jinxi Zhao  | 3108 |
| 4:40PM | <i>Long-Term Learning Behavior in a Recurrent Neural Network for Sound Recognition</i><br>Michiel Boes, Damiano Oldoni, Bert De Coensel and Dick Botteldooren                              | 3116 |
| 5:00PM | <i>Study of Learning Entropy for Novelty Detection in Lung Tumor Motion Prediction for Target Tracking Radiation Therapy</i><br>Ivo Bukovsky, Noriyasu Homma, Matous Cejnek and Kei Ichiji | 3124 |
| 5:20PM | <i>Opinion Retrieval through Unsupervised Topological Learning</i><br>Nicoleta Rogovschi and Nistor Grozavu  | 3130 |
| 5:40PM | <i>A Fast Incremental Kernel Principal Component Analysis for Data Streams.</i><br>Annie anak Joseph and Seiichi Ozawa   | 3135 |

**Special Session: ThN2-3 Neurodynamic Optimization, Chair: Sanqing Hu and Yunong Zhang, Room: 305B**

|        |   |      |
|--------|---|------|
| 4:00PM | <i>A One-Layer Discrete-Time Projection Neural Network for Support Vector Classification</i><br>Wei Zhang and Qingshan Liu  | 3143 |
| 4:20PM | <i>A Novel Discrete-Time Learning Algorithm for Speech Enhancement Using Noise Constrained Parameter Estimation</i><br>Youshen Xia, Guiliang Lin and Weixing Zheng                      | 3149 |
| 4:40PM | <i>Performance Analysis of LVI-Based PDNN Applied to Real-Time Solution of Time-Varying Quadratic Programming</i><br>Yunong Zhang, Fangting Wu, Zhengli Xiao, Zhen Li and Binghuang Cai | 3155 |
| 5:00PM | <i>Model Predictive Control of Multi-Robot Formation Based on the Simplified Dual Neural Network</i><br>Xinzhe Wang, Zheng Yan and Jun Wang   | 3161 |
| 5:20PM | <i>Neurodynamics-Based Model Predictive Control of Autonomous Underwater Vehicles in Vertical Plane</i><br>Zhiying Liu, Xinzhe Wang and Jun Wang  | 3167 |
| 5:40PM | <i>A Single Layer Recurrent Neural Network For Pseudoconvex Optimization Subject to Quasiconvex Constraints</i><br>Jingjing Huang and Guocheng Li                                       | 3173 |

- 6:00PM *Causality from Cz to C3/C4 or between C3 and C4 Revealed by Granger Causality and New Causality during Motor Imagery*  
Sanqing Hu, Hui Wang, Jianhai Zhang, Wanzeng Kong and Yu Cao 3178

#### **ThN2-4 Spiking Neural Networks II, Chair: Zeng-Guang Hou, Room: 305C**

- 4:00PM *Magnitude Comparison in Analog Spiking Neural Assemblies*  
Jose Oliveira-Neto, Felipe Duque-Belfort, Rafael Cavalcanti-Neto and Joao Ranhel 3186
- 4:20PM *Spike-Timing Dependent Morphological Learning for a Neuron with Nonlinear Active Dendrites*  
Phyo Phyo San, Shaista Hussain and Arindam Basu 3192
- 4:40PM *Improved Predictive Personalized Modelling with the Use of Spiking Neural Network System and a Case Study on Stroke Occurrences Data*  
Muhaini Othman, Nikola Kasabov, Enmei Tu, Valery Feigin, Rita Krishnamurthi, Zeng-Guang Hou, Yixiong Chen and Jin Hu 3197
- 5:00PM *Signature of an Anticipatory Response in Area VI as Modeled by a Probabilistic Model and a Spiking Neural Network*  
Bernhard A. Kaplan, Mina A. Khoei, Anders Lansner and Laurent U. Perrinet 3205
- 5:20PM *Predicting Temporal Sequences Using an Event-Based Spiking Neural Network Incorporating Learnable Delays*  
Tingting Gibson, James Henderson and Janet Wiles 3213
- 5:40PM *Feasibility of NeuCube SNN Architecture for Detecting Motor Execution and Motor Intention for Use in BCI Applications*  
Denise Taylor, Nathan Scott, Nikola Kasabov, Elisa Capecchi, Enmei Tu, Nicola Saywell, Yixiong Chen, Jin Hu and Zeng-Guang Hou 3221

#### **ThN2-5 Signal and Image Processing, Chair: Pau-Choo Chung, Room: 305D**

- 4:00PM *On-Line Gaussian Mixture Density Estimator for Adaptive Minimum Bit-Error-Rate Beamforming Receivers*  
Sheng Chen, Xia Hong and Chris Harris 3226
- 4:20PM *The Neoteric Feature Extraction Method of Epilepsy EEG Based on the Vertex Strength Distribution of Weighted Complex Network*  
Fenglin Wang, Qingfang Meng and Yuehui Chen 3234
- 4:40PM *Real-Time Hand Gesture Recognition with Kinect for Playing Racing Video Games*  
Yanmin Zhu and Bo Yuan 3240
- 5:00PM *EEG Energy Analysis for Evaluating Consciousness Level Using Dynamic MEMD*  
Yunchao Yin, Gaochao Cui, Toshihisa Tanaka and Jianting Cao 3247
- 5:20PM *Alzheimer's Disease Classification Based on Gait Information*  
Wei-Hsin Wang, Yu-Liang Hsu, Ming-Chyi Pai, Chun-Yao Wang, Chien-Wen Lin, Hao-Li Wu and Pau-Choo Chung 3251
- 5:40PM *Architectural Distortion Detection from Mammograms Using Support Vector Machine*  
Orawan Netprasat, Sansanee Auephanwiriyakul and Nipon Theera-Umpon 3258

#### **ThN2-6 Neural Modeling and Control, Chair: Hongliang Li, Room: 305E**

- 4:00PM *Data-Driven Iterative Adaptive Dynamic Programming Algorithm for Approximate Optimal Control of Unknown Nonlinear Systems*  
Hongliang Li, Derong Liu, Ding Wang and Chao Li 3265
- 4:20PM *Hybrid Neural Networks for Gasoline Blending System Modeling*  
Wen Yu and Xiaou Li 3272
- 4:40PM *Adaptive Self-Constructing Radial-Basis-Function Neural Control for MIMO Uncertain Nonlinear Systems with Unknown Disturbances*  
Ning Wang, Bijun Dai, Yancheng Liu and Min Han 3278

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|--------|--|------|
| 5:00PM | <i>Robust Structure Selection of Radial Basis Function Networks for Nonlinear System Identification</i><br>Pan Qin and Han Min   | 3284 |
| 5:20PM | <i>Neural Control for a Solid Waste Incinerator</i><br>Rocio Carrasco, Edgar Sanchez, Riemann Ruiz and Catherine Cadet   | 3289 |
| 5:40PM | <i>Reservoir-Based Online Adaptive Forward Models with Neural Control for Complex Locomotion in a Hexapod Robot</i><br>Poramate Manoonpong, Sakyasingha Dasgupta, Dennis Goldschmidt and Florentin Woergoetter | 3295 |

### Friday, July 11, 8:10AM-10:10AM

#### Special Session: FrN1-1 Concept Drift, Domain Adaptation & Learning in Dynamic Environments II, Chair: Giacomo Boracchi and Manuel Roveri, Room: 308

|        |   |      |
|--------|---|------|
| 8:10AM | <i>Resistant Learning on the Envelope Bulk for Identifying Anomalous Patterns</i><br>Shin-Ying Huang, Fang Yu, Rua-Huan Tsaih and Yennun Huang                            | 3303 |
| 8:30AM | <i>A Multi-Objective Ensemble Method for Online Class Imbalance Learning</i><br>Shuo Wang, Leandro L. Minku and Xin Yao   | 3311 |
| 8:50AM | <i>The Parzen Kernel Approach to Learning in Non-Stationary Environment</i><br>Lena Pietruczuk, Leszek Rutkowski, Maciej Jaworski and Piotr Duda                          | 3319 |
| 9:10AM | <i>A Novel Application of Hoeffding's Inequality to Decision Trees Construction for Data Streams</i><br>Piotr Duda, Maciej Jaworski, Lena Pietruczuk and Leszek Rutkowski | 3324 |
| 9:30AM | <i>NEVE++: A Neuro-Evolutionary Unlimited Ensemble for Adaptive Learning</i><br>Tatiana Escovedo, Abs da Cruz Andre, Koshiyama Adriano, Melo Rubens and Vellasco Marley   | 3331 |
| 9:50AM | <i>Exploiting Self-Similarity for Change Detection</i><br>Giacomo Boracchi and Roveri Manuel  | 3339 |

#### Special Session: FrN1-2 Neural Networks Applied to Vision and Robotics II, Chair: Jose Garcia Rodriguez and Jorge Azorin, Room: 305A

|        |  |      |
|--------|--|------|
| 8:10AM | <i>Color Space Selection for Self-Organizing Map Based Foreground Detection in Video Sequences</i><br>Francisco Javier Lopez-Rubio, Ezequiel Lopez-Rubio, Rafael Marcos Luque-Baena, Enrique Dominguez and Esteban J. Palomo | 3347 |
| 8:30AM | <i>Improving Robot Vision Models for Object Detection Through Interaction</i><br>Juergen Leitner, Alexander Foerster and Juergen Schmidhuber   | 3355 |
| 8:50AM | <i>Image-Based Global Localization Using VG-RAM Weightless Neural Networks</i><br>Lauro J. Lyrio Junior, Thiago Oliveira-Santos, Avelino Forechi, Lucas Veronese, Claudine Badue and Alberto F. De Souza                     | 3363 |
| 9:10AM | <i>EEG Based Artificial Learning of Motor Coordination for Visually Inspired Task Using Neural Networks</i><br>Shreyasi Datta, Anwasha Khasnobish, Amit Konar, D. N. Tibarewala and Atulya Nagar                             | 3371 |
| 9:30AM | <i>Serotonin and Dopamine Systems: Internal Areas and Sequential Tasks</i><br>Dongshu Wang, Yihai Duan and Juyang Weng   | 3379 |

#### Special Session: FrN1-3 Complex-Valued Neural Networks, Chair: Akira Hirose and Suresh Sundaram, Room: 305B

|        |  |      |
|--------|--|------|
| 8:10AM | <i>An Introduction to Complex-Valued Recurrent Correlation Neural Networks</i><br>Marcos Eduardo Valle   | 3387 |
| 8:30AM | <i>The HC Calculus, Quaternion Derivatives and Cayley-Hamilton Form of Quaternion Adaptive Filters and Learning Systems</i><br>Yili Xia, Cyrus Jahanchahi, Dongpo Xu and Danilo Mandic | 3395 |
| 8:50AM | <i>Stability Condition for Discrete Time Multi-Valued Recurrent Neural Networks in Asynchronous Update Mode</i><br>Wei Zhou and Jacek M. Zurada  | 3402 |

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|--------|---|------|
| 9:10AM | <i>A New Stability Condition for Discrete Time Recurrent Neural Networks with Complex-Valued Linear Threshold Neurons</i>             |      |
|        | Wei Zhou and Jacek M. Zurada  | 3406 |
| 9:30AM | <i>Ultra-Short-Pulse Acoustic Imaging Using Complex-Valued Spatio-Temporal Neural-Network for Null-Steering: Experimental Results</i> |      |
|        | Kotaro Terabayashi and Akira Hirose   | 3410 |
| 9:50AM | <i>Finite Convergence of the Learning Algorithms for a Modified Multi-Valued Neuron</i>   |      |
|        | Dongpo Xu and Shuang Liang  | 3414 |

#### **FrN1-4 Visual Systems, Chair: Zeng-Guang Hou, Room: 305C**

|        |  |      |
|--------|--|------|
| 8:10AM | <i>V4 Neural Network Model for Visual Saliency and Discriminative Local Representation of Shapes</i>                       |      |
|        | Hui Wei and Zheng Dong   | 3420 |
| 8:30AM | <i>Binocular Visual Servoing Based on PID Neural Network</i>   |      |
|        | Guoyou Li and Xin Wang   | 3428 |
| 8:50AM | <i>Visual Saliency via Loss Coding</i>   |      |
|        | Hao Zhu and Biao Han   | 3435 |
| 9:10AM | <i>Border Ownership in a Nano-Neuromorphic Circuit Using Nonlinear Dendritic Computations</i>                              |      |
|        | Chih-Chieh Hsu and Alice Parker  | 3442 |
| 9:30AM | <i>A Bio-Inspired Approach Modeling Spiking Neural Networks of Visual Cortex for Human Action Recognition</i>              |      |
|        | Haihua Liu and Na Shu  | 3450 |
| 9:50AM | <i>Measurement of Confusion Color Pairs for Dichromats in order to Use Applications Supporting Color Vision Deficiency</i> |      |
|        | Hiroki Takagi, Hiroaki Kudo, Tetsuya Matsumoto, Yoshinori Takeuchi and Noboru Ohnishi                                      | 3458 |

#### **FrN1-5 Data Analysis and Pattern Recognition, Chair: Wladyslaw Homenda, Room: 305D**

|        |   |      |
|--------|---|------|
| 8:10AM | <i>View-Invariant Gait Recognition via Deterministic Learning</i>   |      |
|        | Wei Zeng and Cong Wang  | 3465 |
| 8:30AM | <i>Micro-Expression Recognition Based on Local Binary Patterns from Three Orthogonal Planes and Nearest Neighbor Method</i>                                 |      |
|        | Yanjun Guo, Yantao Tian, Xu Gao and Xuange Zhang  | 3473 |
| 8:50AM | <i>Classification with Rejection Based on Various SVM Techniques</i>  |      |
|        | Wladyslaw Homenda, Marcin Luckner and Witold Pedrycz  | 3480 |
| 9:10AM | <i>Imbalanced Pattern Recognition: Concepts and Evaluations</i>   |      |
|        | Wladyslaw Homenda and Wojciech Lesinski   | 3488 |
| 9:30AM | <i>RNN and SOM Based Classifier to Recognize Assamese Fricative Sounds Designed Using Frame Based Temporal Feature Sets</i>                                 |      |
|        | Chayashree Patgiri, Mousmita Sarma and Kandarpa Kumar Sarma   | 3496 |
| 9:50AM | <i>Artificial Neural Network Based Gait Patterns Identification Using Neuromuscular Signals and Soft Tissue Deformation Analysis of Lower Limbs Muscles</i> |      |
|        | S. M. N. Arosha Senanayake, Joko Triloka, Owais A, Malik and Muhammad Pg. Iskandar  | 3503 |

#### **FrN1-6 Hybrid Architectures and Learning , Chair: Gianluca Bontempi, Room: 305E**

|        |  |      |
|--------|--|------|
| 8:10AM | <i>Recursive Soft Margin Subspace Learning</i>   |      |
|        | Qiao Ye, Zhao Chun and Ye Ning   | 3511 |
| 8:30AM | <i>Sub-Classifer Construction for Error Correcting Output Code Using Minimum Weight Perfect Matching</i> |      |
|        | Patoomsiri Songsiri, Thimaporn Phetkaew, Ryutarō Ichise and Boonserm Kijirikul                           | 3519 |
| 8:50AM | <i>Supervised Topic Regression via Experts</i>   |      |
|        | Song Lin and Ping Guo  | 3526 |

|        |   |      |
|--------|---|------|
| 9:10AM | <i>A Robust Framework for Short Text Categorization Based on Topic Model and Integrated Classifier</i><br>Peng Wang, Heng Zhang, Yu-Fang Wu, Bo Xu and Hong-Wei Hao   | 3534 |
| 9:30AM | <i>Linear Subspace Learning via Sparse Dimension Reduction</i><br>Ming Yin, Yi Guo and Junbin Gao   | 3540 |
| 9:50AM | <i>Learning Optimization for Decision Tree Classification of Non-Categorical Data with Information Gain Impurity Criterion</i><br>Konstantin Sofeikov, Ivan Tyukin, Alexander Gorban, Eugene Mirkes, Danil Prokhorov and Ilya Romanenko | 3548 |

### Friday, July 11, 10:30AM-12:30PM

#### Special Session: FrN2-1 Computational Intelligence Algorithms for Digital Audio Applications, Chair: Stefano Squartini and Francesco Piazza, Room: 308

|         |  |      |
|---------|--|------|
| 10:30AM | <i>Semi-Supervised Non-Negative Tensor Factorisation of Modulation Spectrograms for Monaural Speech Separation</i><br>Tom Barker and Tuomas Virtanen   | 3556 |
| 10:50AM | <i>Power Normalized Cepstral Coefficients Based Supervectors and i-Vectors for Small Vocabulary Speech Recognition</i><br>Emanuele Principi, Stefano Squartini and Francesco Piazza                    | 3562 |
| 11:10AM | <i>Advanced Audio Spatializer Combined with a Multipoint Equalization System</i><br>Stefania Cecchi, Andrea Primavera, Francesco Piazza, Ferruccio Bettarelli and Junfeng Li                           | 3569 |
| 11:30AM | <i>Advanced Intelligent Acoustic Interfaces for Multichannel Audio Reproduction</i><br>Danilo Comminiello, Stefania Cecchi, Michele Gasparini, Michele Scarpiniti, Aurelio Uncini and Francesco Piazza | 3577 |
| 11:50AM | <i>Audio Onset Detection: A Wavelet Packet Based Approach with Recurrent Neural Networks</i><br>Erik Marchi, Giacomo Ferroni, Florian Eyben, Stefano Squartini and Bjorn Schuller                      | 3585 |
| 12:10PM | <i>Transfer Learning Emotion Manifestation Across Music and Speech</i><br>Eduardo Coutinho, Jun Deng and Bjorn Schuller  | 3592 |
| 12:30PM | <i>A Novel Intelligent Systems for Speech Recognition</i><br>Washington Silva and Ginalber Serra   | 3599 |

#### Special Session: FrN2-2 Intelligent Computing for Complex & Big Data Analysis in Health and Biomedical Informatics, Chair: Amit Kumar and Shang-Ming Zhou, Room: 305A

|         |   |      |
|---------|---|------|
| 10:30AM | <i>Domain Transfer Nonnegative Matrix Factorization</i><br>Jim Jing-Yan Wang, Yijun Sun and Halima Bensmail   | 3605 |
| 10:50AM | <i>Identifying Stable Breast Cancer Subgroups Using Semi-Supervised Fuzzy c-Means on a Reduced Panel of Biomarkers</i><br>Daphne Teck Ching Lai and Jonathan Garibaldi                  | 3613 |
| 11:10AM | <i>Mining Textual Data from Primary Healthcare Records - Automatic Identification of Patient Phenotype Cohorts</i><br>Shang-Ming Zhou, Muhammad Rahman, Mark Atkinson and Sinead Brophy | 3621 |
| 11:30AM | <i>Using EEG Artifacts for BCI Applications</i><br>Wanli Ma, Dat Tran, Tien Pham, Trung Le and Hong Lin   | 3628 |
| 11:50AM | <i>Comparison of Distance Metrics for Hierarchical Data in Medical Databases</i><br>Diman Hassan, Uwe Aickelin and Christian Wagner   | 3636 |
| 12:10PM | <i>Investigating the Impacts of Epilepsy on EEG-Based Person Identification Systems</i><br>Dinh Phung, Dat Tran, Wanli Ma, Phuoc Nguyen and Tien Pham                                   | 3644 |

**Special Session: FrN2-3 Data-Driven Adaptive Dynamic Programming, Chair: Derong Liu and Haibo He, Room: 305B**

|         |   |      |
|---------|---|------|
| 10:30AM | <i>Online Learning Control Based on Projected Gradient Temporal Difference and Advanced Heuristic Dynamic Programming</i><br>Jian Fu, Haibo He, Aihong Tang and Sujuan Wei      | 3649 |
| 10:50AM | <i>A Kalman Filter-Based Actor-Critic Learning Approach</i><br>Bin Wang and Dongbin Zhao  | 3657 |
| 11:10AM | <i>Self-Learning PD Algorithms Based on Approximate Dynamic Programming for Robot Motion Planning</i><br>Huiyuan Yang, Qi Guo, Xin Xu and Chuanqiang Lian                       | 3663 |
| 11:30AM | <i>Near Optimal Event-Based Control of Nonlinear Discrete Time Systems in Affine Form with Measured Input Output Data</i><br>Avimanyu Sahoo, Hao Xu and Sarangapani Jagannathan | 3671 |
| 11:50AM | <i>Event-Triggered Reinforcement Learning Approach for Unknown Nonlinear Continuous-Time System</i><br>Xiangnan Zhong, Zhen Ni, Haibo He, Xin Xu and Dongbin Zhao               | 3677 |
| 12:10PM | <i>Longitudinal Control of Hypersonic Vehicles Based on Direct Heuristic Dynamic Programming Using ANFIS</i><br>Xiong Luo, Yi Chen, Jennie Si and Feng Liu                      | 3685 |

**FrN2-4 Data Mining and Knowledge Discovery, Chair: Paulo Adeodato and Alessandro Sperduti, Room: 305C**

|         |   |      |
|---------|---|------|
| 10:30AM | <i>A Study on Asynchronous System in P300 Speller Based on User's Intention of Input</i><br>Kohei Kawai, Tomohiro Yoshikawa and Takeshi Furuhashi   | 3693 |
| 10:50AM | <i>Insights on Prediction of Patients' Response to Anti-HIV Therapies through Machine Learning</i><br>Rogerio Rosa, Rafael Santos, Adamo Brito and Katia Guimaraes                          | 3697 |
| 11:10AM | <i>Recognizing Cross-Lingual Textual Entailment with Co-Training Using Similarity and Difference Views</i><br>Jiang Zhao and Man Lan  | 3705 |
| 11:30AM | <i>A Novel Algorithm for Mining Behavioral Patterns from Wireless Sensor Networks</i><br>Md Mamunur Rashid, Iqbal Gondal and Joarder Kamruzzaman  | 3713 |
| 11:50AM | <i>Continuous Variables Segmentation and Reordering for Optimal Performance on Binary Classification Tasks</i><br>Paulo Adeodato, Domingos S. P. Salazar, Lucas S. Gallindo and Abner G. Sa | 3720 |
| 12:10PM | <i>Hybrid Classification with Partial Models</i><br>Bo Tang, Quan Ding, Haibo He and Steve Kay  | 3726 |

**FrN2-5 Large Scale, Associative and Self-Organizing Networks , Chair: Jinde Cao, Room: 305D**

|         |   |      |
|---------|---|------|
| 10:30AM | <i>A Decomposition Method for Large-Scale Sparse Coding in Representation Learning</i><br>Yifeng Li, Richard Caron and Alioune Ngom   | 3732 |
| 10:50AM | <i>The Stability and Bifurcation Analysis in High Dimensional Neural Networks with Discrete and Distributed Delays</i><br>Wenying Xu, Jinde Cao and Min Xiao                | 3739 |
| 11:10AM | <i>Restricted Boltzmann Machine Associative Memory</i><br>Koki Nagatani and Masafumi Hagiwara   | 3745 |
| 11:30AM | <i>Two-Factor User Authentication with the CogRAM Weightless Neural Net</i><br>Weng Kin Lai, Beng Ghee Tan, Ming Siong Soo and Imran Khan                                   | 3751 |
| 11:50AM | <i>The Learning of Neuro-Fuzzy Approximator with Fuzzy Rough Sets in Case of Missing Features</i><br>Robert Nowicki, Bartosz Nowak, Janusz Starczewski and Krzysztof Cpalka | 3759 |
| 12:10PM | <i>A Dynamic Forecasting Method for Small Scale Residential Electrical Demand</i><br>Andrei Marinescu, Ivana Dusparic, Colin Harris, Vinny Cahill and Siobhan Clarke        | 3767 |

**FrN2-6 Self-Organizing Maps, Chair: Thomas Vacek, Room: 305E**

|         |   |      |
|---------|---|------|
| 10:30AM | <i>A Spiking-Based Mechanism for Self-Organizing RBF Neural Networks</i><br>Honggui Han, Lidan Wang, Junfei Qiao and Gang Feng                                      | 3775 |
| 10:50AM | <i>Support Vector Machine with SOM-Based Quasi-Linear Kernel for Nonlinear Classification</i><br>Yuling Lin, Yong Fu and Jinglu Hu                                  | 3783 |
| 11:10AM | <i>The Generative Adaptive Subspace Self-Organizing Map</i><br>Thusitha Chandrapala and Bertram Shi   | 3790 |
| 11:30AM | <i>Clustering of the Self-Organizing Map Using Particle Swarm Optimization and Validity Indices</i><br>Leonardo Enzo Brito da Silva and Jose Alfredo Ferreira Costa | 3798 |
| 11:50AM | <i>Algorithmic Trading Behavior Identification Using Reward Learning Method</i><br>Steve Yang, Qifeng Qiao, Peter Beling and Scherer William                        | 3807 |

**Friday, July 11, 1:30PM-3:30PM****Special Session: FrN3-1 Intelligent Adaptive Fault Tolerant Control and Optimization, Chair: Huaguang Zhang and Haibo He, Room: 308**

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Model-Free Adaptive Dynamic Programming for Online Optimal Solution of the Unknown Nonlinear Zero-Sum Differential Game</i><br>Chunbin Qin, Huaguang Zhang and Yanhong Luo | 3815 |
| 1:50PM | <i>Direct Adaptive Control of a Four-Rotor Helicopter Using Disturbance Observer</i><br>Fuyang Chen, Bin Jiang and Feifei Lu  | 3821 |
| 2:10PM | <i>Discrete-Time Polynomial Fuzzy Observer Designs via a Sum of Squares Approach</i><br>Yingying Wang, Huaguang Zhang, Jianyu Zhang and Yingchun Wang                         | 3826 |
| 2:30PM | <i>Adaptive Fault-Tolerant Control for a Class of Uncertain Nonlinear MISO Discrete-Time Systems in Triangular Forms with Actuator Failures</i><br>Lei Liu and Zhanshan Wang  | 3831 |
| 2:50PM | <i>Decoupling Control for Five-Phase Fault-Tolerant Permanent-Magnet Motor by Using SVM Inverse System Method</i><br>Guohai Liu, Li Qu, Hao Zhang and Yan Jiang               | 3837 |
| 3:10PM | <i>Fault Diagnosis of Five-Phase Fault-Tolerant Permanent-Magnet Motor Based on Principal Component Neural Network</i><br>Guohai Liu and Lu Zhou                              | 3841 |

**Special Session: FrN3-2 Cognitive Computing and Neuro-Cognitive Robots, Chair: Huajin Tang and Gang Pan, Room: 305A**

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Bio-Inspired Categorization Using Event-Driven Feature Extraction and Spike-Based Learning</i><br>Bo Zhao, Shoushun Chen and Huajin Tang                                   | 3845 |
| 1:50PM | <i>A New Learning Rule for Classification of Spatiotemporal Spike Patterns</i><br>Qiang Yu, Huajin Tang and Kay Chen Tan  | 3853 |
| 2:10PM | <i>Spatial Filter Adaptation Based on Geodesic-Distance for Motor EEG Classification</i><br>Xinyang Li, Cuntai Guan, Kai Keng Ang, Haihong Zhang and Sim Heng Ong             | 3859 |
| 2:30PM | <i>Decoding Motor Cortical Activities of Monkey: A Dataset</i><br>Luoqing Zhou, Yu Qi, Yueming Wang, Gang Pan, Yiwen Wang, Xiaoxiang Zheng and Zhaohui Wu                     | 3865 |
| 2:50PM | <i>Programming a VG-RAM Based Neural Network Computer</i><br>Alberto F. De Souza, Avelino Forechi, Filipe W. Mutz, Mariella Berger, Thiago Oliveira-Santos and Claudine Badue | 3871 |
| 3:10PM | <i>High-Fidelity Compression of Electroneurographic Signals from Motor Cortex</i><br>Rachel Zhang, Gang Pan, Yueming Wang and Zhenfang Hu                                     | 3879 |
| 3:30PM | <i>Cognitive Memory Systems in Consciousness and Memory Model</i><br>Zhongzhi Shi, Xiaofeng Wang and Xi Yang  | 3887 |



**FrN3-3 Unsupervised Learning and Clustering, Chair: Alessandro Ghio, Room: 305B**

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Controlling Orthogonality Constraints for Better NMF Clustering</i><br>Ievgen Redko and Younes Bennani   | 3894 |
| 1:50PM | <i>Random Subspaces NMF for Unsupervised Transfer Learning</i><br>Ievgen Redko and Younes Bennani   | 3901 |
| 2:10PM | <i>User-Generated-Video Summarization Using Sparse Modelling</i><br>Yulong Liu, Huaping Liu, Yunhui Liu and Fuchun Sun  | 3909 |
| 2:30PM | <i>Smartphone Battery Saving by Bit-Based Hypothesis Spaces and Local Rademacher Complexities</i><br>Davide Anguita, Alessandro Ghio, Luca Oneto and Sandro Ridella | 3916 |
| 2:50PM | <i>SVD Truncation Schemes for Fixed-Size Kernel Models</i><br>Ricardo Castro, Siamak Mehrkanoon, Anna Marconato, Johan Schoukens and Johan Suykens                  | 3922 |
| 3:10PM | <i>An Ordinal Kernel Trick for a Computationally Efficient Support Vector Machine</i><br>Yara Rizk, Nicholas Mitri and Mariette Awad                                | 3930 |

**FrN3-4 Cognition, Bio-Inspired and Biomorphic Systems, Chair: Ali Minai, Room: 305C**

|        |   |      |
|--------|---|------|
| 1:30PM | <i>The Stapedius Reflex: Processing Its Neuronal Activity with a Small Embedded System</i><br>Ralf Warmuth and Ralf Salomon                               | 3938 |
| 1:50PM | <i>Dynamic Modeling of an Ostraciiform Robotic Fish Based on Angle of Attack Theory</i><br>Wei Wang, Guangming Xie and Hong Shi                           | 3944 |
| 2:10PM | <i>Detection of Signaling Pathways in Human Brain during Arousal of Specific Emotion</i><br>Reshma Kar, Amit Konar, Aruna Chakraborty and Atulya Nagar    | 3950 |
| 2:30PM | <i>Chunks of Thought: Finding Salient Semantic Structures in Texts</i><br>Mei Mei, Aashay Vanarase and Ali Minai  | 3958 |
| 2:50PM | <i>Bio-Inspired Probabilistic Model for Crowd Emotion Detection</i><br>Mirza Waqar Baig, Emilia Barakova and Matthias Rauterberg                          | 3966 |
| 3:10PM | <i>A Self-Organized Artificial Neural Network Architecture that Generates the McGurk Effect</i><br>Lennart Gustafsson, Tamas Jantvik and Andrew Paplinski | 3974 |

**FrN3-5 Machine Learning and Applications I, Chair: Bijaya Ketan Panigrahi, Room: 305D**

|        |  |      |
|--------|--|------|
| 1:30PM | <i>Exponential Synchronization for a Class of Networked Linear Parabolic PDE Systems via Boundary Control</i><br>Jun-Wei Wang, Cheng-Dong Yang and Chang-Yin Sun           | 3981 |
| 1:50PM | <i>Combining Technical Trading Rules Using Parallel Particle Swarm Optimization Based on Hadoop</i><br>Fei Wang, Philip Yu and David Cheung                                | 3987 |
| 2:10PM | <i>Prediction Interval Estimation for Electricity Price and Demand Using Support Vector Machines</i><br>Nitin Anand Shrivastava, Abbas Khosravi and Bijaya Ketan Panigrahi | 3995 |
| 2:30PM | <i>Enhancing MOPSO through the Guidance of ANNs</i><br>Timothy Rawlins, Andrew Lewis, Jan Hettenhausen and Timoleon Kipouros   | 4003 |
| 2:50PM | <i>Training High-Dimensional Neural Networks with Cooperative Particle Swarm Optimiser</i><br>Anna Rakitianskaia and Andries Engelbrecht                                   | 4011 |
| 3:10PM | <i>Improved Modeling of Pneumatic Muscle Actuator Using Recurrent Neural Network</i><br>Alexander Hosovsky, Jana Mizakova and Jan Pitel                                    | 4019 |

**FrN3-6 Brain-Machine Interfaces, Chair: Li-Wei Ko, Room: 305E**

|        |   |      |
|--------|---|------|
| 1:30PM | <i>Explorer Based on Brain Computer Interface</i><br>Lijuan Bai, Tianyou Yu and Yuanqing Li   | 4025 |
| 1:50PM | <i>Multi-Factor EEG-Based User Authentication</i><br>Tien Pham, Wanli Ma, Dat Tran and Phuoc Nguyen   | 4029 |
| 2:10PM | <i>Recognizing Slow Eye Movement for Driver Fatigue Detection with Machine Learning Approach</i><br>Yingying Jiao, Bao-Liang Lu, Xiaoping Chen, Shanguang Chen and Chunhui Wang | 4035 |

- 2:30PM *Neural Signal Analysis by Landmark-Based Spectral Clustering with Estimated Number of Clusters*  
Thanh Nguyen, Abbas Khosravi, Douglas Creighton and Saeid Nahavandi 4042
- 2:50PM *Calibration-Less Detection of Steady-State Visual Evoked Potentials - Comparisons and Combinations of Methods*  
Hubert Cecotti and Damien Coyle 4050

### Friday, July 11, 4:00PM-6:00PM

#### Special Session: FrN4-1 Computational Intelligence in Cyber Security, Chair: Frank Jiang and Longbing Cao, Room: 308

- 4:00PM *Cognitive Neural Network for Cybersecurity*  
Leonid Perlovsky and Olexander Shevchenko 4056
- 4:20PM *Large Scale Recurrent Neural Network on GPU*  
Boxun Li, Erjin Zhou, Bo Huang, Jiayi Duan, Yu Wang, Ningyi Xu, JIaxing Zhang and Huazhong Yang 4062
- 4:40PM *A Connectionist Approach to Airliner Safety*  
Marvin Oliver Schneider and Joao Luis Garcia Rosa 4070
- 5:00PM *Attribute Weighting: How and When Does it Work for Bayesian Network Classification*  
Jia Wu, Zhihua Cai, Shirui Pan, Xingquan Zhu and Chengqi Zhang 4076
- 5:20PM *Extension of Similarity Measures in VSM: from Orthogonal Coordinate System to Affine Coordinate System*  
Junyu Xuan, Jie Lu, Guangquan Zhang and Xiangfeng Luo 4084

#### Special Session: FrN4-2 Computational Intelligence in Brain Computer Interface, Chair: Li-Wei Ko and Chin-Teng Lin, Room: 305A

- 4:00PM *Medical Diagnosis Applications Using a Novel Interactively Recurrent Self-Evolving Fuzzy CMAC Model*  
Jyun-Guo Wang, Shen-Chuan Tai and Cheng-Jian Lin 4092
- 4:20PM *A Novel Classification Method for Motor Imagery Based on Brain-Computer Interface*  
Chih-Yu Chen, Chun-Wei Wu, Chin-Teng Lin and Shi-An Chen 4099
- 4:40PM *Motor Imagery Classification for Brain-Computer Interfaces through a Chaotic Neural Network*  
Denis Renato de Moraes Piazzentin and Joao Luis Rosa 4103
- 5:00PM *EEG-Based Driving Fatigue Prediction System Using Functional-Link-Based Fuzzy Neural Network*  
Yu-Ting Liu, Yang-Yin Lin, Shang-Lin Wu, Chun-Hsiang Chuang and Chin-Teng Lin 4109
- 5:20PM *Developing a Few-Channel Hybrid BCI System by Using Motor Imagery with SSVEP Assist*  
Li-Wei Ko, Shih-Chuan Lin and Meng-Shue Song 4114
- 5:40PM *A Novel BCI-SSVEP Based Approach for Control of Walking in Virtual Environment Using a Convolutional Neural Network*  
Giacomo Tattoli, Domenico Buongiorno, Claudio Loconsole, Daniele Leonardis, Michele Barsotti, Vitoantonio Bevilacqua, Antonio Frisoli and Massimo Bergamasco 4121

#### FrN4-3 Support Vector Machines and Kernel Methods, Chair: Alessandro Sperduti, Room: 305B

- 4:00PM *Kernel-Based Semi-Supervised Learning for Novelty Detection*  
Van Nguyen, Trung Le, Pham Thien, Mi Dinh and Hoang Thai Le 4129
- 4:20PM *Robust Support Vector Machine*  
Trung Le, Dat Tran, Wanli Ma, Thien Pham, Phuong Duong and Minh Nguyen 4137
- 4:40PM *Integrating Bi-Directional Contexts in a Generative Kernel for Trees*  
Davide Bacciu, Alessio Micheli and Alessandro Sperduti 4145
- 5:00PM *Large Scale Semi-Supervised Learning Using KSC Based Model*  
Siamak Mehrkanoon and Johan Suykens 4152

- 5:20PM *A Practical SIM Learning Formulation with Margin Capacity Control*  
Thomas Vacek 4160
- 5:40PM *Quantized Mixture Kernel Least Mean Square*  
Rosha Pokharel, Sohan Seth and Jose Principe 4168

**FrN4-4 Feature Extraction and Classification Systems, Chair: Emil Eirola, Room: 305C**

- 4:00PM *Multi-View Uncorrelated Linear Discriminant Analysis with Applications to Handwritten Digit Recognition*  
Mo Yang and Shiliang Sun 4175
- 4:20PM *Differentially Private Feature Selection*  
Jun Yang and Yun Li 4182
- 4:40PM *A Binary Feature Selection Framework in Kernel Spaces*  
Chengzhang Zhu, Xinwang Liu, Sihang Zhou, Qiang Liu and Jianping Yin 4190
- 5:00PM *A Flexible and Efficient Algorithm for Regularized Marginal Fisher Analysis*  
Jinrong He, Lixin Ding, Lei Jiang and Li Huang 4198
- 5:20PM *Estimation of Individual Prediction Reliability Using Error Analysis Applied to Short-Term Load Forecasting Problem*  
Elia Matsumoto and Emilio Del-Moral-Hernandez 4206
- 5:40PM *The Delta Test: The 1-NN Estimator as a Feature Selection Criterion*  
Emil Eirola, Amaury Lendasse, Francesco Corona and Michel Verleysen 4214

**FrN4-5 Machine Learning and Applications II, Chair: Giacomo Boracchi, Room: 305D**

- 4:00PM *Improved Biogeography-Based Optimization Approach to Secondary Protein Prediction*  
Ruisong Fan, Haibin Duan and Guangming Xie 4223
- 4:20PM *Integrating Self-Organizing Neural Network and Motivated Learning for Coordinated Multi-Agent Reinforcement Learning in Multi-Stage Stochastic Game*  
Teck-Hou Teng, Ah-Hwee Tan, Janusz Starzyk, Yuan-Sin Tan and Loo-Nin Teow 4229
- 4:40PM *Extracting Temporal Knowledge from Time Series: A Case Study in Ecological Data*  
Reggio Hartono, Russel Pears, Nikola Kasabov and Susan Worner 4237
- 5:00PM *Planning-Driven Behavior Selection Network for Controlling a Humanoid Robot*  
Yu-Jung Chae and Sung-Bae Cho 4244
- 5:20PM *Sliding Window-Based Analysis of Multiple Foreign Exchange Trading Systems by Using Soft Computing Techniques*  
Rodrigo Brito and Adriano Oliveira 4251
- 5:40PM *Learning in Dynamic Decision Making: The Usability Process*  
Liana Stanca, Ramona Lacurezeanu and Cristina Felea 4259

**FrN4-6 Neuromorphic Hardware, Chair: Eros Pasero, Room: 305E**

- 4:00PM *Majority Neuron Circuit Having Large Fan-in with Non-Volatile Synaptic Weight*  
Akima Hisanao, Katayama Yasuhiro, Nakajima Koji, Sakuraba Masao and Sato Shigeo 4266
- 4:20PM *Accelerating Pattern Matching in Neuromorphic Text Recognition System Using Intel Xeon Phi Coprocessor*  
Khadeer Ahmed, Qinru Qiu, Parth Malani and Mangesh Tamhankar 4272
- 4:40PM *Optimising the Overall Power Usage on the SpiNNaker Neuromimetic Platform*  
Evangelos Stromatias, Cameron Patterson and Steve Furber 4280
- 5:00PM *Efficient Implementation of STDP Rules on SpiNNaker Neuromorphic Hardware*  
Peter U. Diehl and Matthew Cook 4288
- 5:20PM *Robust Doublet STDP in a Floating-Gate Synapse*  
Roshan Gopalakrishnan and Arindam Basu 4296
- 5:40PM *Clustering and Synchronous Firing of Coupled Rulkov Maps with STDP for Modeling Epilepsy*  
Naohiro Shibuya, Charles Unsworth, Yoko Uwate and Yoshifumi Nishio 4302