2017 IEEE 16th International Conference on Cognitive Informatics & Cognitive Computing (ICCI*CC 2017)

Oxford, United Kingdom
26-28 July 2017

IEEE Catalog Number: CFP17312-POD
ISBN: 978-1-5386-0772-5

Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP17312-POD
ISBN (Print-On-Demand): 978-1-5386-0772-5
ISBN (Online): 978-1-5386-0771-8

Additional Copies of This Publication Are Available From:

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

Table of Contents

Preface iii

Conference Organization iv

Table of Contents vi

Keynotes 1

The Power of Cognitive Computing: An Example of Cognitive Dynamic Regional Development Modeling 1
Prof. Janusz Kacprzyk

Searching in Harsh Environments 3
Prof. Ophir Frieder

Semantic Computing and Cognitive Computing/Informatics 4
Prof. Phillip Sheu

Cognitive Foundations of Knowledge Science and Deep Knowledge Learning by Cognitive Robots 5
Prof. Yingxu Wang

Session A1 - Cognitive Informatics 6

Formal Ontology Generation by Deep Machine Learning 6
Yingxu Wang, Mehrdad Valipour, Omar A. Zatarain, Marina Gavrilova, Amir Hussain, Newton Howard and Shushma Patel

Extending Reference into Cognitive Computing: Through the Eyes of Ontological 16
Victor Raskin and Libby C. Chernouski

Model-based Polynomial Function Approximation with Spiking Neural Networks 22
Stefan Ulbrich, Terrence Steward, Igor Peric, Arne Roennau, Marius Zoellner and Ruediger Dillmann

Visualizing the Functional Connectivity of Bilingual and Monolingual Brain during Multitasking 28
Monica Ashokumar, Rosheema Bala J. B., Geethanjali B. and Mahesh Veezhinathan

Session A2 - Cognitive Computing 37

Cognitive Imaging: Using Knowledge Representation for Reliable Segmentation of MR Angiography Data 37
Julia Rayz, Vitaliy Rayz and Victor Raskin

Formal Rules for Concept and Semantics Manipulations in Cognitive Linguistics and Machine Learning 43
Yingxu Wang

Building Semantic Hierarchies of Formal Concepts by Deep Cognitive Machine 51
Mehrdad Valipour and Yingxu Wang

Cognitive Exploration of Regions through Analyzing Geo-tagged Social Media Data 59
Yunzhe Wang, George Baciu and Chenhui Li

Session A3 – Cognitive Machine Learning 65

Transfer Learning for Brain Decoding using Deep Architectures 65
Burak Velioglu and Fatos T. Yarman Vural

Formal Concept Refinement by Deep Cognitive Machine Learning 71
Omar A. Zatarain and Yingxu Wang

Persian Named Entity Recognition 79
Kia Dashtipour, Mandar Gogate, Ahsan Adeel, Abdulrahman Algarafi, Newton Howard and Amir Hussain

From Computing with Numbers to Computing with Numeric Words 84
Rodolfo A. Fiorini

An Improved KNN Text Classification Algorithm based on Simhash 92
Jie Liu, Ting Jin, Kejia Pan, Yi Yang, Yan Wu and Xin Wang

Session A4 – Affective Computing 96

Class Discovery from Semi-Structured EGG Data for Affective Computing and Personalisation 96
Aladdin Ayesh, Miguel Arevalillo-Herráez and Pablo Arnau-Gonzalez

Cognitive Modulation of Appraisal Variables in the Emotion Process of Autonomous Agents 102
Sergio Castellanos, Luis-Felipe Rodriguez, Luis A. Castro and Joaquin Pérez

Classification of EEG Signal by WT-CNN Model in Emotion Recognition System 109
Benyu Zhang, Huiping Jiang and Linshan Dong

Modeling of the Chasing Behaviors for Developmental Program of Children with Autism Spectrum Disorders 115
Airi Tsuji, Satoru Sekine, Takuya Enomoto, Soichiro Matsuda, Junichi Yamamoto and Kenji Suzuki

Music Emotions Recognition by Cognitive Classification Methodologies 121
Junjie Bai, Kan Luo, Jun Peng, Jinliang Shi, Ying Wu, Lixiao Feng, Jianqing Li and Yingxu Wang

Session A5 – Cognitive Image Processing 130

A Linear Regression Model for Estimating Facial Image Quality 130
Fatema Tuz Zohra, Andrei Dmitri Gavrilov, Omar A. Zatarain and Marina Gavrilova

Machine Learning based Computer-Aided Diagnosis of Liver Tumours 139
Liaqat Ali, Khaled Khelil, Summrina K. Wajid, Zain U. Hussain, Moiz A. Shah, Adam Howard, Ahsan Adeel, Amir A. Shah, Unnam Sudhakar, Newton Howard and Amir Hussain

A Novel Brain Image Processing Method for the Application of Detecting the GBM Disease Patterns in Anatomic Sections of T1-weighted 3D Magnetic Resonance Imaging 146
Peifang Guo and Prabir Bhattacharya

Investigations on the Brain Connectivity Patterns in Progression of Alzheimer's Disease using Functional MR Imaging and Graph Theoretical Measures 151
Bhuvaneshwari Bhaskaran and Kavitha Anandan

Session A6 – Brain Informatics and Consciousness 161

Complex-Valued Computational Model of Hippocampus CA3 Recurrent Collaterals 161
Ashraya Samba Shiva, Mandar Gogate, Newton Howard, Bruce Graham and Amir Hussain

Formulation of Cognitive Skills: A Theoretical Model Based on Psychological and Neuroscience Studies 167
Sadique Ahmad, Kan Li, Yang Li, Humera Qureshi and Siraj Khan

The Effects of Typing Demand on Learner's Motivation/Attitude-Driven Behaviour (MADB) Model with Mouse and Keystroke Behaviours 175
Yee Mei Lim, Aladdin Ayesh and Martin Stacey

Exact Spike Timing Computational Model of Convolutional Associative Memories 182
Igor Peric, Felix Schneider, Cameron Price, Stefan Ulbrich, Arne Roennau, Marius Zoellner and Ruediger Dillmann

Session A7 – Cognitive Systems (I) 191

Indoor Localization with Occlusion Removal 191
Yushi Li, George Baciu, Yu Han and Chenhui Li

A Study on Merging Mechanisms of Simple Hopfield Network Models for Building Associative Memory 199
Peter Mungai and Runhe Huang

Model Based Formal Design for MVB System 207
Ji Qi and Guiming Luo

NBPMF: Novel Network-Based Inference Methods for Peptide Mass Fingerprinting 213
Zhewei Liang, Gilles Lajoie and Kaizhong Zhang

Random Neural Networks based Cognitive Controller for HVAC in Non-Domestic Building using LoRa 220
Abbas Javed, Hadi Larijani, Andrew Wixted and Rohinton Emmanuel

Session A8 – Cognitive Linguistics and Semantics **227**
Extracting Aspects of Online Reviews: What Can We Make of Text Similarity? 227
Penghao Wang and Julia Rayz

An Interval Particle Swarm Optimization Algorithm for Numerical Function Optimization 233
Xiaoyu Lin, Yiwen Zhong and Riqing Chen

A Fuzzy Ontology for Geography Knowledge of China`s College Entrance Examination 237
Xingyu Chen, Guangping Zeng, Qingchuan Zhang, Liu Chen, Danfeng Wu

Question Answering over Knowledgebase with Attention-based LSTM Networks and Knowledge Embeddings 243
Liu Chen, Guangping Zeng, Qingchuan Zhang, Xingyu Chen and Danfeng Wu

Session A9 – Brain Informatics **247**
A Functional Connectivity based Approach to Visualize the Event Related Changes in Depression through Cognitive Information Processing during Working Memory Tasks 247
V. Ritu, M Keerthana, B Geethanjali and Mahesh Veezhinathan

Functional Connectivity Assessment for Episodic Memory Functional Connectivity Assessment for Episodic Memory 257
Kapardi Mallampalli and Kavitha A.

Early Diagnosis in Mild Cognitive Impairment: A Case Study in Approaches to Inductive Logic Programming 262
Niken Prasasti Martono, Hayato Ohwada and Takehiko Yamaguchi

Session B1 – Brain-Inspired Systems **268**
Brain-Inspired Systems and Predicative Competence 268
Rodolfo A. Fiorini

An Engineering Model of the Cognitive Mind 276
Carla V.M. Marques, Carlo E.T. de Oliveira and Cibele R.C. Oliveira

(1+1=2) — A Quantum Model of Neurobiology and Cognition 283
Wen-Ran Zhang

Adaptive Step Mechanism in Glowworm Swarm Optimization 291
Hong-Bo Wang, Ke-Na Tian, Xue-Na Ren and Xu-Yan Tu

Session B2 – Neural Networks and Machine Learning **297**
Fractal Based Cognitive Neural Network to Detect Obfuscated and Indistinguishable Internet Threats 297
Sana Siddiqui, Muhammad Salman Khan, Ken Ferens and Witold Kinsner

Study on Hydrocarbon of Seismic Data Structure Characteristics based on Grey System Thoery 309
Wei Zhou and Haimin Guo

A Mathematical and Simulation Model on Stability and Parameters of Multi-equilibrium Points in CNNs 315
Qi Han, Jun Peng, Sk Md Mizanur Rahman, Ahmad Almogren, Atif Alamri, Tengfei Weng and Jin Liu

A Cognitive Approach for Attribute Selection in Internet Dataset 319
Danish Kaleem and Ken Ferens

Session B3 – Cognitive Vehicles and Self-Driving **329**
Route-planning based on a Passenger Condition for Self-driving Vehicles 329
Hironori Hiraishi

Common-Sense Approach to Avoid Near-Miss Incidents of Pedestrians Suddenly Crossing Narrow Roads 337
Fumio Mizoguchi, Akira Yoshizawa and Hirotoshi Iwasaki

Study of Cognitive Route Search Technique for Self-driving Vehicles 341
Hironori Hiraishi and Fumio MizoguchiHironori Hiraishi and Fumio Mizoguchi

Detecting Driver's Visual Attention Area by using Vehicle-mounted Device 346
Nobuhiro Mizuno, Akira Yoshizawa, Akihiro Hayashi and Takahiro Ishikawa

Analysis of Driver's Visual Attention Using Near-Miss Incident Cases 353
Akira Yoshizawa and Hirotoshi Iwasaki

Session B4 - Cognitive Algorithms 361

Combining Multiple Algorithms for Portfolio Management using Combinatorial Fusion 361
Yuxiao Luo, Bruce Kristal, Christina Schweikert and D. Frank Hsu

The Integrated Loading and Unloading Quay Crane Scheduling Problem by AFSA-GA Algorithm 367
Yi Liu, Sabina Shahbazzade and Jian Wang

Influence of Type and Level of Noise on the Performance of an Adaptive Novelty Detector 373
Matous Cejnek and Ivo Bukovsky

The Tornadogenesis Optimization Algorithm 378
Ravi Kumar Saidala and Nagaraju Devarakonda

A Multi-View Fusion Approach for Entity Alignment 390
Chunxia Zhang, Xiuzhang Yang, Shuliang Wang, Zhendong Niu and Yu Guo

Session B5 – Big Data Cognition and Mining 394

A RST-based Stateful Data Analytics Within Spark 394
Jike Ge, Zuqin Chen, Can Liu, Jun Peng Wenbo He, Nan Zhu

Big Data Processing Framework of Learning Weather Information and Road Traffic Collision using Distributed CEP from CCTV Video: Cognitive Image Processing 402
In Jeong Lee

Towards MapReduce Approach with Dynamic Fuzzy Inference/Interpolation for Big Data Classification Problems 407
Shangzhu Jin, Jun Peng and Dong Xie

A Computational Cognitive Model for Political Positioning and Reactions in Web Media 414
Eric F. de M. Araujo and Michel Klein

Session B6 – Bioinformatics 423

Kinect Gait Skeletal Joint Feature-Based Person Identification 423
Md Wasiur Rahman and Marina Gavrilova

Estimation of Biomarkers for Autism and its Co-morbidities using Resting State EEG 431
Vishnu P. Kandasamy and Kavitha A.

Towards Multimodal Saliency Detection: An Enhancement of Audio-visual Correlation Estimation 438
Antonio Rodríguez-Hidalgo, Carmen Peláez-Moreno and Ascensión Gallardo-Antolín

Establishment and Optimization of Human Skin Charge Modeling 444
Lixiao Feng, Dong Xie, Jun Peng, Guorong Chen, Chengyuan Chen and Junjie Bai

Session B7 – Computational Intelligence and Applications 450

Two Term Controller Design for Multivariable Linear Time Delay Systems 450
Sonal Singh and Shubhi Purwar

Identification of Finger Vein using Neural Network Recognition Research Based on PCA 456

Changlong He, Zuojin Li, Liukui Chen and Jun Peng

Application of Artificial Intelligence in Continuous Emission Monitoring System 461
Dedong Tang, Julan Mou, Dong Xie and Xi Tang

Self-Powered Intelligent door handle based on Triboelectric Nanogenerator 465
Yiping Deng, Lu Liao, Gang Hu, Junjie Bai, Xiaoyun Zhang, Yuan Zhai, Ying Wu and Guang Zhu

Application of PSO LS-SVM Forecasting Model in Oil and Gas Production Forecast 470
Yudeng Qiao, Jun Peng, Lan Ge and Hongjin Wang

Session B8 – Cognitive Systems (II) 475

Algorithmic Knowledge Profiles for Introspective Monitoring in Artificial Cognitive Agents 475
Manuel Caro, Adan Gomez and Juan Giraldo

Design of Information Value Determination Method for Information-Sharing Systems During Large-Scale Disasters 482
Tatsuya Sonobe, Akiko Takahashi and Takuo Suganuma

From Standardized Data Formats to Standardized Tools for Optimization Algorithm Benchmarking 490
Thomas Weise

Autonomic Computing Meets SCADA Security 498
Sajid Nazir, Shushma Patel and Dilip Patel

Session B9 – Hybrid Man-machine Systems 503

Semantic Framework to Enhance Human-Robot Interaction using EKRL 503
Omar Adjali and Amar Ramdane-Cherif

Construction of Discharge Summaries Classifier 513
Shusaku Tsumoto, Tomohiro Kimura, Haruko Iwata and Shoji Hirano

A Cognitive Anti-jamming and Interference-Avoidance Stochastic Game 520
Mohamed A. Aref and Sudharman K. Jayweera

Author Index 528