# 2013 Conference on Technologies and Applications of Artificial Intelligence

## TAAI 2013

### Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>xiii</td>
</tr>
<tr>
<td>Sponsors and Co-Organizers</td>
<td>xv</td>
</tr>
<tr>
<td>TAAI 2013 Organizing Committees</td>
<td>xvi</td>
</tr>
<tr>
<td>AIIS 2013 Special Session: Organization</td>
<td>xxiii</td>
</tr>
<tr>
<td>IHB 2013 Special Session: Organization</td>
<td>xxv</td>
</tr>
<tr>
<td>CCB 2013 Workshop: Organization</td>
<td>xxvi</td>
</tr>
<tr>
<td>HCC 2013 Workshop: Organization</td>
<td>xxviii</td>
</tr>
<tr>
<td>IWCG 2013 Workshop: Organization</td>
<td>xxix</td>
</tr>
<tr>
<td>TAEA 2013 Workshop: Organization</td>
<td>xxx</td>
</tr>
</tbody>
</table>

### Main Conference

#### Long Presentations

#### Machine Learning I

Clustering Unclustered Data: Unsupervised Binary Labeling of Two Datasets

Having Different Class Balances ................................................................. 1  
  *Marthinus Christoffel du Plessis, Gang Niu, and Masashi Sugiyama*

Key Stroke Profiling for Data Loss Prevention ............................................. 7  
  *Jain-Shing Wu, Yuh-Jye Lee, Song-Kong Chong, Chih-Ta Lin, and Jung-Lun Hsu*

Active Learning for Multiclass Cost-Sensitive Classification Using Probabilistic

Models ............................................................................................................. 13  
  *Po-Lung Chen and Hsuan-Tien Lin*
Machine Learning II
Pairwise Regression with Upper Confidence Bound for Contextual Bandit with Multiple Actions .......................................................... 19
  Ya-Hsuan Chang and Hsuan-Tien Lin
Data Selection Techniques for Large-Scale Rank SVM .................................................. 25
  Ken-Yi Lin, Te-Kang Jan, and Hsuan-Tien Lin
Lossless Vector-Quantised Index Coding with Index-Pattern Coding Scheme .................. 31
  Y.C. Liu, G.H. Lee, J.S. Taur, and L.P. Chi

Data Mining I
Energy Disaggregation via Clustered Regression Models: A Case Study in the Convenience Store ................................................................. 37
  Hsiao-Hui Chen, Ping-Feng Wang, Ching-Tien Sung, Yi-Ren Yeh, and Yuh-Jye Lee
On Package Organization for Willingness Satisfaction in Social Networks ........................ 43
  Chung-Kuang Chou, Hui-Ju Hung, Hong-Han Shuai, Chih-Ya Shen,
  De-Nian Yang, Meng-Jung Shih, and Wei-Jung Lai
Preference-Aware Community Detection for Item Recommendation ............................... 49
  Jia-Ching Ying, Bo-Nian Shi, Vincent S. Tseng, Huan-Wen Tsai,
  Kuang Hung Cheng, and Shun-Chieh Lin

Data Mining II
Using Attribute Construction to Improve the Predictability of a GP Financial Forecasting Algorithm .................................................. 55
  Michael Kampouridis and Fernando E.B. Otero
Frequent Pattern Based User Behavior Anomaly Detection for Cloud System .................... 61
  Chien-Yi Chiu, Chi-Tien Yeh, and Yuh-Jye Lee
VizStory: Visualization of Digital Narrative for Fairy Tales ............................................ 67
  Chieh-Jen Huang, Cheng-Te Li, and Man-Kwan Shan

Evolutionary Computation & Genetic Algorithms
Multi-objective Flexible Job Shop Scheduling Problem Based on Monte-Carlo Tree Search .......................................................... 73
  Tung-Ying Wu, I-Chen Wu, and Chao-Chin Liang
Parkinson's Disease Diagnosis Using Modular Systems ................................................. 79
  Mona Noori Hosseini and Behrooz Makki
Intelligent Human-Computer Interaction
A Preliminary Study on Preventive Care System Based on Game Playing
with Communication Robots .................................................................84
   Takuya Okano, Daisuke Kitakoshi, and Masato Suzuki
Fuzzy Controlled PAD Emotional State of a NAO Robot ...........................................90
   Alban Nanty and Rodolphe Gelin
Design of an Intelligent Memory Reclamation Service on Android ..................................97
   Cheng-Zen Yang and Bo-Shiung Chi

AI Applications I
Gen-Meta: Generating Metaphors Using a Combination of AI Reasoning
and Corpus-Based Modeling of Formulaic Expressions ..............................................103
   Andrew Gargett and John Barnden
Linking Statistics of Betting Behavior to Difficulties of Test Items: An
Exploration ...............................................................................................109
   Chien-Liang Chen, Chao-Lin Liu, Chia-Ying Lee, Yu-Lin Tzeng, and Chia-Ju Chou
Cloud-Mobile Computing Based Real-Time VoIP with PSO-ANFIS Tuning ..........................115
   Bao Rong Chang, Hsiu Fen Tsai, Chi-Ming Chen, Yi-Sheng Chang,
   and Chien-Feng Huang

AI Applications II
A Hybrid Algorithm for Fast Learning Individual Daily Activity Plans
for Multiagent Transportation Simulation ....................................................122
   Tai-Yu Ma and Philippe Gerber
Inertial-Sensor-Based Balance Analysis System for Patients with Alzheimer’s
Disease ......................................................................................................128
   Wei-Hsin Wang, Pau-Choo (Julia) Chung, Yu-Liang Hsu, Ming-Chyi Pai,
   and Chien-Wen Lin
Experimental Evaluation of Artificial Bee Colony with Greedy Scouts
for Constraint Satisfaction Problems ........................................................134
   Yuko Aratsu, Kazunori Mizuno, Hitoshi Sasaki, and Seiichi Nishihara

Short Presentations
Machine Learning and Pattern Recognition

Mathematical Formula Detection in Heterogeneous Document Images ...........................................140
   Wei-Ta Chu and Fan Liu

Elastic Warping of Radial Features for Shape Alignment in Sketch Retrieval ..................................146
   Bor-Shen Lin, Wen-Chi Yeh, and Yen-Chun Lin

A Sharpness Measure for Image Quality Assessment Using Average Effective Number of Neighbors .................................................................152
   Wen-Hung Liao

DDIM-CAPTCHA: A Novel Drag-n-Drop Interactive Masking CAPTCHA against the Third Party Human Attacks .........................................................158
   Quan-Bin Ye, Te-En Wei, Albert B. Jeng, Hahn-Ming Lee, and Kuo-Ping Wu

On Enhancing Recent Multi-player Game Playing Strategies Using a Spectrum of Adaptive Data Structures ........................................................................164
   Spencer Polk and B. John Oommen

Multi-view Malicious Document Detection ......................................................................................170
   Jing-Yao Lin and Hsing-Kuo Pao

Data Mining and Web Intelligence

X2-Search: Contextual Expert Search in Social Networks ....................................................................176
   Cheng-Te Li and Man-Kwan Shan

Discovering Point-of-Interest Signatures Based on Group Features from Geo-social Networking Data .................................................................182
   Ling-Yin Wei, Mi-Yen Yeh, Grace Lin, Ya Hui Chan, and Wei Jung Lai

A Hybrid Preference-Aware Recommendation Algorithm for Live Streaming Channels .................................................................188
   Tzu-Wei Yang, Wen-Yuh Shih, Jiun-Long Huang, Wei-Chih Ting, and Pin-Chuan Liu

An Efficient RSM-Based Algorithm for Measuring Chlorophyll on Orchid Leaves with a Microspectrometer ....................................................................194
   Chin-Shun Hsu, Yung-Hsing Peng, Po-Chuang Huang, and Yen-Dong Wu

An Adaptive Page Clustering Based Weighting Method for Information Retrieval .................................................................199
   Yi-Xian Lin and Hung-Yu Kao

Session-Based Recommendation -- Case Study on Tencent Weibo ......................................................205
   Chen-Ling Chen and Chia-Hui Chang
AI Applications III

Handling a Dynamic Mixture of Sources in Blind Source Separation Tasks ..................................................211

Somnuk Phon-Amnuaisuk

Multivariable Type-2 Self-Organizing Fuzzy Logic Controllers for Regulating Anesthesia with Rule Base Extraction .....................................................................................................................217

Yan-Xin Liu, Jiann-Shing Shieh, Faiyaz Doctor, Shou-Zen Fan, and Kuo-Kuang Jen


Olusegun Peter Awe, Ziming Zhu, and Sangarapillai Lambotharan

A Crowdsourcing-Based Approach to Assess Concentration Levels of Students in Class Videos .........................................................228

Hu-Cheng Lee, Chao-Lin Wu, and Ling-Jyh Chen

FML-Based Recommender System for Restaurants .................................................................................................234

Woan-Tyng Lin, Mei-Hui Wang, Chang-Shing Lee, Kanta Kurozumi, and Yukie Majima

Interactive Learning from Demonstration with a Multilevel Mechanism for Collision-Free Navigation in Dynamic Environments .........................................................................................................................240

Chung-Che Yu and Chieh-Chih Wang

Special Session on Advanced Interaction for Intelligent Systems

Walking Route Recommender System Considering SAW Criteria .........................................................................................246

Wataru Sasaki and Yasufumi Takama

A System for Retrieving Time-Series Data Based on Linguistic Expression .................................................................................252

Naoya Otsuka, Daiki Hasui, and Mitsunori Matsushita

Uncertainty Sampling for Constrained Cluster Ensemble ..............................................................................................................257

Masayuki Okabe and Seiji Yamada

An ICF Decision Supporting System Based on Sensoring Technologies .................................................................................................263

Lieu-Hen Chen, Wei-Fen Hsieh, Eri Sato-Shimokawara, Yasufumi Takama, and Toru Yamaguchi

Tap Model to Improve Input Accuracy of Touch Panels .........................................................................................................................265

Takahisa Tani and Seiji Yamada

Constrained Clustering Based on Semantic Information .........................................................................................................................268

Takahiro Nishigaki and Takashi Onoda

Maintaining Situation Awareness over Time -- A Survey on the Evolution Support of Situation Awareness Systems .........................................................................................................................274

Andrea Salfinger, Werner Retschitzegger, and Wieland Schwinger
Special Session on Influencing Human Behavior

Long Presentations
Consideration about Applicability of Recommender System Employing Personal-Value-Based User Model .........................................................282
    Shunichi Hattori and Yasufumi Takama
Computer-Mediated Reflection: An Analysis of the Mechanisms Underlying an Effective Rewriting Process .........................................................288
    Mitsunori Matsushita and Nanae Shirozu
P-CUBE: Block Type Programming Tool for Visual Impairments .................................................................294
    Shun Kakehashi, Tatsuo Motoyoshi, Kenfichi Koyanagi, Toru Ohshima, and Hiroshi Kawakami
Encouraging User Interaction of Social Network through Tweet Recommendation Using Community Structure .........................................................300
    Kenya Sudo, Shogo Nagasaka, Kuniaki Kobayashi, Tadahiro Taniguchi, and Toshiaki Takano
A Card-Type Tool to Support Divergent Thinking for Embodying Benefit of Inconvenience .................................................................306
    Yuichi Hasebe, Hiroshi Kawakami, Toshihiro Hiraoka, and Kosuke Naito
Five Sightseeing Navigation Systems Using Limited Information .................................................................312
    Shuichi Takagi, Tomoko Izumi, and Yoshio Nakatani
An Opportunistic Tourism Navigation System Using Photographing Point Recommendation .................................................................318
    Hiroya Sakaguchi, Tomoko Izumi, and Yoshio Nakatani
Preliminary Considerations on Shikake Design Process .................................................................324
    Naohiro Matsumura and Larry Leifer

Short Presentations
Research on Estimation of Relative Position and Construction of Three-Dimensional Space Using Range Image Sensor .................................................................329
    Yoshinori Tsukada, Etsuji Kitagawa, Shigenori Tanaka, Satoshi Abiko, and Yuki Fukushima
Contemplating AI Technologies from the Viewpoint of Benefit of Inconvenience .................................................................335
    Hiroshi Kawakami and Toshihiro Hiraoka
A Tourist Navigation System in Which a Historical Character Guides to Related Spots by Hide-and-Seek .................................................................337
    Hirofumi Eguma, Tomoko Izumi, and Yoshio Nakatani
International Workshop on Computational, Cognitive, and Behavioral Social Science

The Strategic Impacts of a Success CEO .................................................................343
Shirley J. Ho

Analysis of Conceptualization Patterns across Groups of People ..........................349
Fumiko Kano Glückstad, Tue Herlau, Mikkel N. Schmidt, Morten Mørup, Rafal Rzepka, and Kenji Araki

Optimal Bankruptcy Decisions of Supply Chain Agents under Uncertainty ...............355
Po-Yuan Chen

Emergence of Aggregation from Mutual Beneficial Interaction ...............................359
Han Fu, Ke Wu, Chao Wang, and Yougui Wang

Complex Dynamics of a N-Players Cournot Game with Adaptive Adjustments .............363
Ke Wu, Wanting Xiong, and Yougui Wang

On the Prediction Accuracy of Prediction Markets: Would the Spatial Distribution of Information Matter? .................................................................367
Bin-Tzong Chie and Shu-Heng Chen

Personality Traits and Routes to Cooperation in Two-Player Public Good Games ..........370
Tongkui Yu and Yun Li

International Workshop on Human-Centric Computing

An Assistive Tool to Improve Usability of Error Dialogs ........................................376
Tejaswinee Kelkar, Prakash Gadepalli, and Bipin Indurkhya

Falls Detection and Notification System Using Tri-axial Accelerometer and Gyroscope Sensors of a Smartphone .........................................................382
Waskitho Wibisono, Dedy Nur Arifin, Baskoro Adi Pratomo, Tohari Ahmad, and Royyana M. Ijtihadie

International Workshop on Computer Games

Bitboard Connection Code Design for Connect6 .........................................................386
Jung-Kuei Yang

On the Efficiency of Executing Diverse Game Tree Search Applications in a Volunteer Computing Federation .........................................................392
Lung-Pin Chen, I-Chen Wu, Yuan-Yao Chang, and Wen-Jie Tseng
International Workshop on Theory and Applications of Evolutionary Algorithms

Two-Phase Pareto Local Search to Solve the Biobjective Set Covering Problem ................................................................................................................................. 397
   Thibaut Lust and Daniel Tuyttens

Optimized SCC Processor by Using Parallel Genetic Algorithms ..................................................................................................................403
   Nicolas Lassabe

Author Index ..................................................................................................................................................................................408