

The series "Advances in Intelligent and Soft Computing" contains publications on various areas within so-called soft computing which include fuzzy sets, rough sets, neural networks, evolutionary computations, probabilistic and evidential reasoning, multi-valued logic, and related fields. The publications within "Advances in Intelligent and Soft Computing" are primarily textbooks and proceedings of important conferences, symposia and congresses. They cover significant recent developments in the field, both of a foundational and applicable character. An important characteristic feature of the series is the short publication time and world-wide distribution. This permits a rapid and broad dissemination of research results.

Yves Demazeau · Frank Dignum · Juan M. Corchado · Javier Bajo
Rafael Corchuelo · Emilio Corchado · Florentino Fernández-Riverola
Vicente J. Julián · Pawel Pawlewski · Andrew Campbell (Eds.)

Demazeau et al. (Eds.)



Trends in Practical Applications of Agents and Multiagent Systems

PAAMS, the International Conference on Practical Applications of Agents and Multiagent Systems is an international yearly forum to present, to discuss, and to disseminate the latest developments and the most important outcomes related to real-world applications. It provides a unique opportunity to bring multi-disciplinary experts, academics and practitioners together to exchange their experience in the development of Agents and Multiagent Systems.

This volume presents the papers that have been accepted for the 2010 edition in the Special Sessions and Workshops. PAAMS'10 Special Sessions and Workshops are a very useful tool in order to complement the regular program with new or emerging topics of particular interest to the participating community. Special Sessions and Workshops that emphasize on multi-disciplinary and transversal aspects, as well as cutting-edge topics were especially encouraged and welcomed.

Trends in Practical Applications of Agents and Multiagent Systems

Trends in Practical Applications of Agents and Multiagent Systems

8th International Conference on Practical Applications of Agents and Multiagent Systems

ISSN 1867-5662

ISBN 978-3-642-12432-7



9 783642 124327

Available
online

springerlink.com

springer.com

Springer

Editors

Yves Demazeau
Laboratoire d'Informatique de Grenoble
Centre National de la Recherche
Scientifique, Maison Jean Kuntzmann
110 av. de la Chimie
F-38041 Grenoble, France
E-mail: yves.demazeau@imag.fr

Frank Dignum
Department of Information and
Computing Sciences
Universiteit Utrecht Centrumgebouw Noord,
office A117, Padualaan 14, De Uitho
3584CH Utrecht, The Netherlands
E-mail: dignum@cs.uu.nl

Juan M. Corchado
Departamento de Informática y Automática
Facultad de Ciencias Universidad
de Salamanca Plaza de la Merced
S/N 37008 Salamanca, Spain
E-mail: corchado@usal.es

Javier Bajo
Escuela Universitaria de Informática
Universidad Pontificia de Salamanca,
Compañía 5, 37002 Salamanca, Spain
E-mail: jbajo@upsa.es

Rafael Corchuelo
ETSI Informática Universidad
de Sevilla Avda. Reina Mercedes
s/n 41012 Sevilla, Spain
E-mail: corchu@us.es

Emilio Corchado
Departamento de Informática
y Automática Facultad de Ciencias
Universidad de Salamanca Plaza de la
Merced S/N 37008 Salamanca, Spain
E-mail: escorchado@ubu.es

Florentino Fernández-Riverola
Escuela Superior de Ingeniería
Informática, Edificio Politécnico,
Despacho 408, Campus Universitario
As Lagoas s/n, 32004 Ourense, Spain
E-mail: riverola@ei.uvigo.es

Vicente Julián
Departamento de Sistemas Informáticos
y Computación Universidad Politécnica
de Valencia, Camino de Vera s/n
46022 Valencia, Spain
E-mail: vinglada@dsic.upv.es

Pawel Pawlewski
Department of Computing and Management
Poznan University of Technology
Strzelecka Str. 11, 60965 Poznan, Poland
E-mail: pawel.pawlewski@put.poznan.pl

Andrew Campbell
Department of Computer Science
Dartmouth College 6211 Sudikoff Laboratory
Hanover, NH 03755-3510, USA
E-mail: campbell@cs.dartmouth.edu

ISBN 978-3-642-12432-7

e-ISBN 978-3-642-12433-4

DOI 10.1007/978-3-642-12433-4

Advances in Intelligent and Soft Computing

ISSN 1867-5662

Library of Congress Control Number: 2010923872

© 2010 Springer-Verlag Berlin Heidelberg

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilm or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable for prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Typeset & Cover Design: Scientific Publishing Services Pvt. Ltd., Chennai, India.

Printed on acid-free paper

5 4 3 2 1 0

springer.com

Contents

Special Session on Adaptive Multiagent Systems

Use of Agents to Realize a Federated Searching of Learning Objects	1
<i>Jaime Muñoz-Arteaga, Edgar A. Calvillo-Moreno, Carlos A. Ochoa-Zezzatti, René Santaolaya-Salgado, Fco. Álvarez-Rodríguez</i>	
MDD for Virtual Organization Design	9
<i>Jorge Agüero, Miguel Rebollo, Carlos Carrascosa, Vicente Julián</i>	
Towards Soccer Simulation as a Testbed for Adaptive Systems and Agreement Technologies	19
<i>Víctor Sánchez-Anguix, Juan A. García-Pardo, Ana García-Fornes, Vicente Julián</i>	
Normative Argumentation	29
<i>N. Criado, S. Heras, E. Argente, V. Julián</i>	
Engineering Ambient Intelligence Services by Means of MABS	37
<i>Teresa García-Valverde, Alberto García-Sola, Francisco Lopez-Marmol, Juan A. Botia</i>	
Mobile Agent Middleware for Intelligent Management of Communication Infrastructures	45
<i>Carmelo R. García, Francisco Alayón, Ricardo Pérez</i>	
A Multiagent System for Efficient Portfolio Management	53
<i>Vivian F. López, Noel Alonso, Luis Alonso, María N. Moreno</i>	
Managing Real-Time Web Services through Agents	61
<i>Elena del Val, Martí Navarro, Vicente Julián, Miguel Rebollo</i>	

Open MAS Architecture. Providing Real Time Solutions	69
<i>Martí Navarro, Sara Rodríguez, Vicente Julián, Vivian F. López</i>	
Special Session on Multiagent Systems for Health Care and Bioinformatics	
PathAgent: Multi-agent System for Updated Pathway Information Integration	77
<i>M. Reboiro-Jato, D. Glez-Peña, R. Domínguez, G. Gómez-López, D.G. Pisano, C. Campos, F. Fdez-Riverola</i>	
Multi-agent System for Mass Spectrometry Analysis	87
<i>Miguel Reboiro-Jato, Daniel Glez-Peña, Hugo M. Santos, Mário S. Diniz, Carlos Lodeiro, José L. Capelo, Florentino Fdez-Riverola</i>	
Multi-agent Personal Memory Assistant	97
<i>Ângelo Costa, Paulo Novais, Ricardo Costa, Juan M. Corchado, José Neves</i>	
TENSSION: A Tool for the Medical Patient Follow-Up	105
<i>Del Rey Ignacio, Ana Belén Gil, R. González-Celador</i>	
Dynamic Planning with Bayesian Network Applied in MAS	113
<i>Juan F. De Paz, Manuel Pablo Rubio, Angélica González</i>	
Special Session on Multiagent Systems for Ambient Intelligence	
Enhancing the Role of Multi-agent Systems in the Development of Intelligent Environments	123
<i>Davide Carneiro, Paulo Novais, Ricardo Costa, José Neves</i>	
Towards Distributed Wireless Intelligent Sensor Networks . . .	131
<i>J.A. Fernández-Prieto, J. Canada-Bago, M.A. Gadeo-Martos, J.R. Velasco</i>	
Context-Aware Agents for Vehicular Networks: An Aspect-Oriented Approach	139
<i>Mercedes Amor, Lidia Fuentes</i>	
Reasoning on a Semantic Web Based Context-Awareness Middleware	147
<i>Alberto García-Sola, Teresa García-Valverde, Juan A. Botía</i>	

Contents	XV
Agent-Based AmI System Case Study: The Easy Line + Project	157
<i>Armando Roy Delgado, Rubén Blasco, Álvaro Marco, Diego Cirujano, Roberto Casas, Armando Roy Yarza, Vic Grout, Richard Picking</i>	
Multiagent System for Detecting Passive Students in Problem-Based Learning	165
<i>Alexandre Ádames Alves Pontes, Francisco Milton Mendes Neto, Gustavo Augusto Lima de Campos</i>	
Context-Aware Agents for People Detection and Stereoscopic Analysis	173
<i>Sara Rodríguez, Juan F. De Paz, Pablo Sánchez, Juan M. Corchado</i>	
Analysis and Design of a SOA-Based Multi-agent Architecture	183
<i>Dante I. Tapia, Ricardo S. Alonso, Carolina Zato, Oscar Gil, Fernando De la Prieta</i>	
Special Session on Multi-Agent Systems for Manufacturing and Supply Chain	
A Multiagent Scheduling Repair Method for Disruption Management in Complex Socio-technical Organizations	191
<i>Sebastien Fournier, Alain Ferrarini</i>	
Price Updating in Combinatorial Auctions for Coordination of Manufacturing Multiagent Systems	201
<i>Juan José Lavios Villahoz, Ricardo del Olmo Martínez, Alberto Arauzo Arauzo, José Manuel Galán Ordax</i>	
Study on Integrated Model of Lean and Agile Supply Chain Based on Multi-DPs	209
<i>Jiang Mei Xian, Feng Ding Zhong, Fan Jia Jing, Yan Lian Lian, Jin Shou Song</i>	
Towards Improving Supply Chain Coordination through Agent-Based Simulation	217
<i>Areti Manataki, Yun-Heh Chen-Burger, Michael Rovatsos</i>	
Using Multi-agent System for Improving and Implementing a New Enterprise Modeling Tool	225
<i>Paul-Eric Dossou, Pawel Pawlewski</i>	
Production Process Based on CIMOSA Modeling Approach and Software Agents	233
<i>Pawel Pawlewski, Arkadiusz Kawa</i>	

A Beehive-Like Approach for Dynamic Generation of Integration Services to Enable Adaptive Supply Chains Using Enterprise Tomography	241
<i>Ammar Memari, Roberto Pérez López de Castro, Jan Aalmlink</i>	
Cooperative Purchasing of Logistics Services among Manufacturing Companies Based on Semantic Web and Multi-agent System	249
<i>Arkadiusz Kawa, Pawel Pawlewski, Paulina Golinska, Marcin Hajdul</i>	
Sandbox for Development of Evolving Manufacturing Control Architectures	257
<i>Zbigniew J. Pasek</i>	
Agent-Based Model of Kanban Flows in the Environment with High Demand Variances	267
<i>Paulina Golińska, Joanna Oleśków-Szlapka, Agnieszka Stachowiak, Paweł Rudiak</i>	
Supply Chain with Reverse Flows- Benefiting from Recycled Resources	277
<i>Konrad Fuks, Paulina Golinska, Agnieszka Stachowiak</i>	
Special Session on Enterprise Application and Information Integration	
e-Wedding Based on Multi-agent System	285
<i>Kobkul Kularbphetong, Gareth Clayton, Phayung Meesad</i>	
Distributed Computing Using RESTful Semantic Web Services	295
<i>Antonio Garrote Hernández, María N. Moreno García</i>	
Enhancing the Services Integration Mechanism in the HoCa Multi-agent Architecture	303
<i>J.A. Fraile, Jesús A. Román, Belén Pérez-Lancho</i>	
Integrating Deep-Web Information Sources	311
<i>Iñaki Fernández de Viana, Inma Hernandez, Patricia Jiménez, Carlos R. Rivero, Hassan A. Sleiman</i>	
Ontological Trading in a Multi-agent System	321
<i>J. Criado, N. Padilla, L. Iribarne, J.A. Asensio, F. Muñoz</i>	

An Agent-, Service-Based Platform Supporting Ontological Integration of Proficient Knowledge Managed in Decision Making	331
<i>Elsa Trigueros, María V. Hurtado, Kawtar Benghazi, José-Manuel Zurita</i>	
Special Session on Software Agents in Knowledge Management	
A Multi-agent Recommender System to Suggest Documents in Communities of Practice	339
<i>Aurora Vizcaíno, Juan Pablo Soto, Javier Portillo-Rodríguez, Mario Piattini</i>	
AIDeM: Agent-Based Intrusion Detection Mechanism	347
<i>Cristian Pinzón, Martí Navarro, Javier Bajo</i>	
A Multi-agent System that Searches for Learning Objects in Heterogeneous Repositories	355
<i>Fernando De la Prieta, Ana Belén Gil</i>	
Application of a Modeling Standard Language on the Definition of Agent Oriented Development Processes	363
<i>Alma M. Gómez-Rodríguez, Juan C. González-Moreno</i>	
Special Session on Bio-Inspired and Multi-Agents Systems: Applications to Languages	
Variable Length-Based Genetic Representation to Automatically Evolve Wrappers	371
<i>David F. Barrero, Antonio González, María D. R-Moreno, David Camacho</i>	
A Case Study on Grammatical-Based Representation for Regular Expression Evolution	379
<i>Antonio González-Pardo, David F. Barrero, David Camacho, María D. R-Moreno</i>	
Towards the Automatic Programming of H Systems: jHsys, a Java H System Simulator	387
<i>J.M. Rojas Síles, M. de la Cruz Echeandía, A. Ortega de la Puente</i>	
L Systems as Bio-MAS for Natural Language Processing	395
<i>Leonor Becerra-Bonache, Suna Bensch, M. Dolores Jiménez-López</i>	
Poetic RNA: Adapting RNA Design Methods to the Analysis of Poetry	403
<i>Veronica Dahl, M. Dolores Jiménez-López, Olivier Perriquet</i>	

A Visual Language for Modelling and Simulation of Networks of Evolutionary Processors	411
<i>Antonio Jimenez, Emilio del Rosal, Juan de Lara</i>	
An Evolutionary Confidence Measure for Spotting Words in Speech Recognition	419
<i>Alejandro Echeverría, Javier Tejedor, Dong Wang</i>	
Workshop on Artificial Intelligence and Distributed Systems	
Intelligent Agents and Wireless Sensor Networks: A Healthcare Telemonitoring System	429
<i>Ricardo S. Alonso, Oscar García, Carolina Zato, Oscar Gil, Fernando De la Prieta</i>	
Indoor Navigation Multi-agent System for the Elderly and People with Disabilities	437
<i>Jose Maria Falco, Miguel Idiago, Armando Roy Delgado, Alvaro Marco, Angel Asensio, Diego Cirujano</i>	
Algorithms of Machine Learning for K-Clustering	443
<i>S. José Luis Castillo, José R. Fernández del Castillo, León González Sotos</i>	
Monitoring and Adaptation of Assessment Process in Virtual Courses Based in Multi-agent Systems	453
<i>M. Néstor D. Duque, C. Demetrio Ovalle, B. Jovani Jiménez</i>	
A Model-Based Ambient Agent Providing Support in Handling Desire and Temptation	461
<i>Mark Hoogendoorn, Zulfiqar A. Memon, Jan Treur, Muhammad Umair</i>	
Cluster Analysis and Decision Trees of MR Imaging in Patients Suffering Alzheimer's	477
<i>Ali Hamou, Michael Bauer, Benoit Lewden, Andrew Simmons, Yi Zhang, Lars-Olof Wahlund, Catherine Tunnard, Iwona Kloszewska, Patrizia Mecozzi, Hilkka Soininen, Magda Tsolaki, Bruno Vellas, Sebastian Muehlboeck, Alan Evans, Per Julin, Niclas Sjögren, Christian Spenger, Simon Lovestone, Femida Gwadry-Sridhar, other participants in the AddNeuroMed consortium</i>	
Improving the Quality of Health Service with Smart Communication	485
<i>Rosa Cano, Manuel P. Rubio, Ana de Luis</i>	

Contents	XIX
Multi-Agent System (MAS) Applications in Ambient Intelligence (AmI) Environments	493
<i>Nayat Sánchez-Pi, Eleni Mangina, Javier Carbó, José Manuel Molina</i>	
Agents to Help Context-Aware System in Home Care	501
<i>Juan A. Fraile, Dante I. Tapia, Jesús A. Román, Oscar García</i>	
SDL Ontology for Specifying Systems Based on Finite State Machines	509
<i>Marina Bagić Babac, Marijan Kunštić</i>	
Applying Data Mining Techniques to Stock Market Analysis	519
<i>Gabriel Fiol-Roig, Margaret Miró-Julià, Andreu Pere Isern-Deyà</i>	
Synthesis and Analysis of Classifiers Based on Generalized Model of Identification	529
<i>M. Tatur, D. Adzinets, M. Lukashevich, S. Bairak</i>	
Multiagent Based Spectrum Sharing Using Petri Nets	537
<i>Usama Mir, Leila Merghem-Boulahia, Dominique Gaiiti</i>	
A Multi Agent Architecture for Tourism Recommendation	547
<i>Laura Sebastia, Adriana Giret, Inma Garcia</i>	
Improving Functionalities in a Multi-agent Architecture for Ocean Monitoring	555
<i>Fernando de la Prieta, Oscar Gil, Carolina Zato, Beatriz Martín, Alberto García</i>	
Multiagent Systems in Stock Index Prediction	563
<i>Ricardo Antonello, Ricardo Azambuja Silveira</i>	
Experiments on Robotic Multi-agent System for Hose Deployment and Transportation	573
<i>Ivan Villaverde, Zelmar Echevoyen, Ramón Moreno, Manuel Graña</i>	
On Cooperative Swarm Foraging for Simple, Non Explicitly Connected, Agents	581
<i>Mireia Sempere, Fidel Aznar, Mar Pujol, Ramon Rizo</i>	
Analyzing Large-Scale Crowd Simulations for Building Evacuation	591
<i>Carlos García-Cabrera, Pedro Morillo, Juan M. Orduña</i>	

Agent Collaboration Framework	599
<i>Juan C. González-Moreno, Francisco J. Rodríguez-Martínez, Rubén Romero-González, Cástor Sánchez-Chao</i>	
Workshop on Systems, Man, & Cybernetics: SMC-Workshop.- IEEE.- SPANISH CHAPTER	
Some Issues and Extensions of JADE to Cope with Multi-agent Operation in the Context of Ambient Intelligence	607
<i>A. Paz-Lopez, G. Varela, S. Vazquez-Rodriguez, J.A. Becerra, R.J. Duro</i>	
P300-Based Brain-Computer Interface for Internet Browsing	615
<i>José L. Sirvent, José M. Azorín, Eduardo Iáñez, Andrés Úbeda, Eduardo Fernández</i>	
Modeling Virtual Agent Behavior in a Computer Game to Be Used in a Real Environment	623
<i>Catalina Roncancio, Jaime Gómez G-B, Eduardo Zalama</i>	
A Legal View of Ambient Assisted Living Developments	631
<i>J.P. Pedraza, M.A. Patricio, A. De Asís, J.M. Molina</i>	
An Intelligent Tutoring System Oriented to the Integration of People with Intellectual Disabilities	639
<i>A. Conde, K. López de Ipiña, M. Larrañaga, J.A. Elorriaga, J.M. López, E. Irigoyen, N. Garay-Vitoria, A. Ezeiza, J. Rubio</i>	
An Automatic Programming ACO-Based Algorithm for Classification Rule Mining	649
<i>Juan Luis Olmo, José María Luna, José Raúl Romero, Sebastián Ventura</i>	
Energy Cost Reduction in the Synchronization of a Pair of Nonidentical Coupled Hindmarsh-Rose Neurons	657
<i>A. Moujahid, A. D'Anjou, F. Torrealdea, F.J. Torrealdea</i>	
A Color Transformation for Robust Detection of Color Landmarks in Robotic Contexts	665
<i>Ramón Moreno, Manuel Graña, Alicia d'Anjou</i>	
Low Quality Data Management for Optimising Energy Efficiency in Distributed Agents	673
<i>Jose R. Villar, Enrique de la Cal, Javier Sedano</i>	

Contents	XXI
Interactive Multimedia Tabletops (IMT) for Casual Users ...	681
<i>Andoni Beristain Iraola, Manuel Graña Romay</i>	
Emotion Elicitation Oriented to the Development of a Human Emotion Management System for People with Intellectual Disabilities	689
<i>R. Martínez, K. López de Ipiña, E. Irigoyen, N. Asla, N. Garay, A. Ezeiza, I. Fajardo</i>	
Acoustic Phonetic Decoding Oriented to Multilingual Speech Recognition in the Basque Context	697
<i>N. Barroso, K. López de Ipiña, A. Ezeiza</i>	
A Computer-Aided Decision Support System for Shoulder Pain Pathology	705
<i>K. López de Ipiña, M.C. Hernández, M. Graña, E. Martínez, C. Vaquero</i>	
Unsupervised Visualization of SQL Attacks by Means of the SCMAS Architecture	713
<i>Álvaro Herrero, Cristian I. Pinzón, Emilio Corchado, Javier Bajo</i>	
Assessing Knowledge Management in the Power Sector through a Connectionist Model	721
<i>Álvaro Herrero, Lourdes Sáiz, Emilio Corchado</i>	
Author Index	731

Unsupervised Visualization of SQL Attacks by Means of the SCMAS Architecture

Álvaro Herrero, Cristian I. Pinzón, Emilio Corchado, and Javier Bajo

Abstract. This paper presents an improvement of the SCMAS architecture aimed at securing SQL-run databases. The main goal of such architecture is the detection and prevention of SQL injection attacks. The improvement consists in the incorporation of unsupervised projection models for the visual inspection of SQL traffic. Through the obtained projections, SQL injection queries can be identified and subsequent actions can be taken. The proposed approach has been tested on a real dataset, and the obtained results are shown.

Keywords: Multiagent System for Security, Neural Projection Models, Unsupervised Learning, Database Security, SQL Injection Attacks.

1 Introduction

Over the last years, one of the most serious security threats to databases has been the SQL injection attack [1]. In spite of being a well-known type of attack, the SQL injection remains at the top of the published threat list [2]. The solutions proposed so far seem insufficient to block this type of attack because the vast majority of them are based on centralized mechanisms [3], [4] with little capacity to work in distributed and dynamic environments. Furthermore, the detection and classification mechanisms proposed by these solutions lack the learning and adaptation capabilities for dealing with attacks and variations of the attacks that may appear in the future.

Álvaro Herrero
Civil Engineering Department, University of Burgos
C/ Francisco de Vitoria s/n, 09006 Burgos, Spain
e-mail: ahcosio@ubu.es

Cristian I. Pinzón · Emilio Corchado · Javier Bajo
Departamento de Informática y Automática, Universidad de Salamanca,
Plaza de la Merced s/n 37008, Salamanca, Spain
e-mail: {cristian_ivanp, jbaejope}@usal.es, escorchado@ubu.es

References

1. Halfond, W.G.J., Viegas, J., Orso, A.: A Classification of SQL-Injection Attacks and Countermeasures. In: Proceedings of the IEEE International Symposium on Secure Software Engineering, Arlington, VA, USA (2006)
2. Breach Security Inc. The Web Hacking-Incidents Database (2008)
3. Halfond, W.G.J., Orso, A.: AMNESIA: analysis and monitoring for NEutralizing SQL-injection attacks. In: Proceedings of the 20th IEEE/ACM international Conference on Automated software engineering (ASE 2005). ACM, New York (2005)
4. Kosuga, Y., Kono, K., Hanaoka, M., Hishiyama, M., Takahama, Y.: Sania: Syntactic and Semantic Analysis for Automated Testing against SQL Injection. In: 23rd Annual Computer Security Applications Conference. IEEE Computer Society, Los Alamitos (2007)
5. Bajo, J., Corchado, J.M., Pinzón, C., Paz, Y.D., Pérez-Lancho, B.: SCMAS: A Distributed Hierarchical Multi-Agent Architecture for Blocking Attacks to Databases. *International Journal of Innovative Computing, Information and Control* (2008)
6. Allen, J., Christie, A., Fithen, W., McHugh, J., Pickel, J., Stoner, E.: State of the Practice of Intrusion Detection Technologies. Technical Report CMU/SEI-99-TR-028. Carnegie Mellon University - Software Engineering Institute (2000)
7. Herrero, Á., Corchado, E., Gastaldo, P., Zunino, R.: Neural Projection Techniques for the Visual Inspection of Network Traffic. *Neurocomputing* 72(16-18), 3649–3658 (2009)
8. Corchado, J.M., Laza, R.: Constructing deliberative agents with case-based reasoning technology. *International Journal of Intelligent Systems* 18, 1227–1241 (2003)
9. Pearson, K.: On Lines and Planes of Closest Fit to Systems of Points in Space. *Philosophical Magazine* 2(6), 559–572 (1901)
10. Demartines, P., Herault, J.: Curvilinear Component Analysis: A Self-Organizing Neural Network for Nonlinear Mapping of Data Sets. *IEEE Transactions on Neural Networks* 8(1), 148–154 (1997)
11. Corchado, E., Fyfe, C.: Connectionist Techniques for the Identification and Suppression of Interfering Underlying Factors. *International Journal of Pattern Recognition and Artificial Intelligence* 17(8), 1447–1466 (2003)
12. Kohonen, T.: The Self-Organizing Map. *IEEE* 78(9), 1464–1480 (1990)
13. Corchado, E., MacDonald, D., Fyfe, C.: Maximum and Minimum Likelihood Hebbian Learning for Exploratory Projection Pursuit. *Data Mining and Knowledge Discovery* 8(3), 203–225 (2004)
14. Friedman, J.H., Tukey, J.W.: A Projection Pursuit Algorithm for Exploratory Data-Analysis. *IEEE Transactions on Computers* 23(9), 881–890 (1974)
15. Seung, H.S., Soccia, N.D., Lee, D.: The Rectified Gaussian Distribution. *Advances in Neural Information Processing Systems* 10, 350–356 (1998)
16. Damele, B.: SQLMAP0.5 – Automated SQL Injection Tool (2007)