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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.

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ADVANCES IN INTELLIGENT AND *SOFT COMPUTING* 71

Yves Demazeau et al. (Eds.)

# Trends in Practical Applications of Agents and Multiagent Systems

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

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## 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

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# 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.

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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

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