

Research Group on Artificial Intelligence.

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The Research Group on Artificial Intelligence at the Universitat Rovira i Virgili was founded in 1994. Since 1998 it is directed by the Dr. David Riaño and in the period between 1998 and 2003 it has had eleven full-time members: five doctors, five PhD students, and one postgraduate, apart of several undergraduate students. The interests of the group are centred in Artificial Intelligence in Medicine and Artificial Intelligence to Design and Control Industrial Plants. The group has collaborated with the Hospital Joan XXIII (Tarragona), the Hospital de la Santa Creu i Sant Pau (Barcelona), the Wastewater Treatment Plant at Granollers (Barcelona).

From the technological point of view, the group has been working with Multi-agent Technologies, Data Mining and Knowledge Discovery, Believe Modelling, and Model-Based Reasoning. In the last six years the group has participated in two IST EU projects, one five-year Spanish CICYT project and one two-year Catalan CIRIT project. Moreover, the members of the group have been participating individually in other national and international projects. The group has been involved in the Agent Cities EU Network of Excellence, coordinates two projects within the network, and participates in the AgentCities Spanish Network. The group belongs to the EU Networks of Excellence AgentLink, Monet and Planet. Within the group, GRUSMA is an active subgroup of researchers in multi-agent systems. application of Intelligent Data Analysis to predict patient evolution in Hospitals and Health Care Institutions, Multiagent modelling to supervise transplant co-ordination of human organs and tissues, Multiagent and Data Mining technologies to analyse and control Waste-water treatment plants, the modelling and organisation of working teams in the design and construction of chemical plants, and the extraction and structuring of information from the Internet. <

1. AI Research in Medicine and Health-Care

The period 1998-2001 includes the SMASH project. It is a CICYT-funded project for research and development of new technologies of multiagent systems involving Artificial Intelligence techniques in reasoning, learning, communication, and cooperation with the goal of improve the services of the Hospital System in Catalonia.

However, the activities of the Banzai research group are more concerned with other projects as Cosys, Palliasys and HeCase.

Cosys emerges from the HISYS work. In HISYS, the historical evolution of all the patients admitted to a hospital is a source of information that is studied with intelligent data analysis methods. HISYS is an intelligent system in which transitions of the patients between the hospital units and services are represented by a draft chart. Two useful operations are implemented, filtering and adaptation, to both modify the chart in order to represent only the interesting information, and also to transform the general chart into a new patient chart. HISYS incorporates an inductive learning algorithm that generates knowledge rules to predict the evolution of new patients in the hospital. This knowledge is automatically organized in a rule-based DSS. The work HISYS evolved to incorporate cost analysis and health-care quality assessment. The new project was called COSYS.

COSYS is centered in the extension of a hospital computer system with techniques for DRG-based cost analysis (DRG stands for diagnostic related groups), it includes mechanisms to calculate the real costs per patient, to adjust the DRG related weights and to make budget comparisons with possible partial and marginal studies with patient, treatment, and healthcare structure prototyping. The system was used to study budget deviations in the Hospital Joan XXIII. The project started from the hypothesis that the DRG weights vary according to the moment, medical and pharmacologic discoveries, the socio-sanitary situation and other aspects. The DRG weights is then a time-limited utility. The project constructed a computer system which was variable and adaptable to the healthcare reality, and alternative DRG weight were proposed for some target diseases. The system applied Data Mining techniques, graphical GUIs and some other AI functionalities.

Some of these AI functionalities have been exported to the PALLIASYS project. This new project is concerned with the fact that the arrival of the Information Society (IST) based on the Information and Communication New Technologies is forcing changes in the way that different sectors of the society work, and the health care sector is one of them. Health assistance is provided by a distributed network of services (hospitals, primary health care unit, out-patients services, and at-home care) to people with different requirements who can access these services: patients, general practitioners, physicians, nurses, secretaries, hospital managers, etc. The new technologies can improve this access to the health care services. PALLIASYS' main objective is to develop an application to help the palliative patient assistance, in particular the at-home patients. A palliative patient is in the last stage of a painful and long disease and requires a treatment to ease his last days suffering. The patient stays at home, if the disease allows that, surrounded by his relatives, but he is continuously monitored by health assistants, and if needed he may be moved to a hospital or a palliative hospice. The new communication technologies (e.g. mobile phones, Internet, PDAs) can be employed to facilitate the interaction between patients, health care providers, and medical data. On the other hand, the patient medical records stored in the Palliative Care Unit at the Santa Cruz y San Pablo Hospital (Barcelona) can be analysed to extract and discover knowledge from the patient historical Data-Bases in order to provide doctors with decision support mechanisms. The project aims to integrate four sub-systems that we are currently working on: (1) telecommunication system, (2) Secured storage of medical records, (3) Use of the stored information to improve the patient's care in two aspects: health care control (visits, prescriptions, tests, etc.) and data analysis (patient profile model creation, relevant data and parameters, etc.), and (4) knowledge generation to support medical decision making.

Concerning the use of multi-agent systems, HeCaSe (Health Care Services) is an agent-based application developed by the group that provides medical services. It contains agents (autonomous software entities) that have medical information and implement the behaviour of a set of health care entities of a sanitary region: medical centres, departments and doctors. They coordinate their tasks to simulate the operation of the whole medical organisation and the interaction between them, providing a set of services to the users (citizens or visitors of a city) and to the medical staff (doctors).

The system is part of the Agent Cities initiative, whose main aim is to provide agent-based intelligent services to improve the quality of life of citizens. It is currently running and accessible in the Agent Cities network of platforms. This work was presented on the Agentcities Agent Technology Competition (February 2003) where it was awarded with the Third Prize in Applications Category and the Special Public Prize.

2. AI Research in Industrial processes

Between 1999 and 2002, the group has collaborated with the Knowledge Engineering and Machine Learning Group at the Technical University of Catalonia, and the the Institute of Environment at the Universitat de Girona in the design and construction of a multi-agent system to supervise the activities in a waste-water treatment plant.

Moreover, it has been a member of the EU IST 5thFP project "hTechSight: A KM platform with intelligence and insight capabilities for technology intensive industries" (IST-2001-33174). This project was concerned with the painfully familiar challenges that we face every day in assessing the competitive performance of the business. Certain questions that arise in today's organisations operating in the new business environment tried to be solved with the development of some knowledge management technologies. These questions can be summarized in:

- * Is the quality/price of my products competitive?
- * What new products are emerging that might make mine obsolescent?
- * What new products could I deliver to gain an advantage on my competitors?
- * Am I using best-in-class technologies and producing at minimum practical cost?
- * What new technologies are emerging that might change best practice and threaten my position?
- * Am I missing opportunities for new business?
- * Where are the areas of growth?
- * How do I best respond to them?
- * Can I establish some "preferred supplier" situations?
- * Am I forming the right alliances and do they work effectively?
- * Am I properly integrated into the supply chains?

.... and so on!

Simultaneously, we are also all painfully aware that there is a vast amount of information "out there": in journals, newspapers, trade analyses, consultants' reports, from Government Departments, etc. and that we simply do not have the time to scan everything on the off-chance that it might apply to us! Nowadays, there is also a vast (and rapidly growing) amount of information on the "The Web". This information may be simply an electronic version of the traditional sources but, because of its timeliness and accessibility the web is also increasingly being used as a preferred means of dissemination: information will appear on the web that appears no-where else. Effective use of the web as an information resource is becoming a pre-requisite for competitive business performance: the trouble is that, once again, we simply do not have the time to scan everything! There is no "one-stop-shop", the information is fragmented and dispersed in a bewildering (and rapidly growing) array of websites.

Confronted with this situation, how can we turn the web into an effective weapon for competitive advantage? The objective of the h-TechSight Project aimed to provide an answer to this question.

3. Lists

3.1. Staff

Researchers			
	Name	E-mail	Membership period
	Xavier Mallafré Antonio Moreno David Riaño Aïda Valls	xmallafr@etse.urv.es amoreno@etse.urv.es drianyo@etse.urv.es avalls@etse.urv.es	1998- 1995- 1992- 1997-
Students			
	Name	E-mail	Membership period
	John Bohada Javier Gramajo Iván López Juan Martínez David Sánchez David Isern	jbohada@etse.urv.es jgramajo@etse.urv.es ilopez@etse.urv.es jumartin@etse.urv.es dsanchez@etse.urv.es disern@etse.urv.es sprado@etse.urv.es	2003- 2000-2003 2000- 2000- 2003- 2002- 1998-
Former Members			
	Name	E-mail	Membership period
	Arantza Aldea Beatriz López Ramón Sangüesa Francesc Serratos Vicenç Torra	a.aldea@reading.ac.uk blopez@silver.udg.es sanguesa@lsi.upc.es fserrato@etse.urv.es vtorra@iiaa.csic.es	1999-2003 1992-1995, 1998-2000 - 1998-2002 1992-1998
External Collaborators			
	Name	E-mail	Membership period
	Susana Prado	susana_prado@ieci.es	1998-

5.2. Projects

1. VIM: Virtual Multicomputer for Symbolic Applications

European Community project: CHRX-CT93-0401
 From January 1994 to December 1997
 Coordinator: Julian Padget (University of Bath)
 Main investigator at the Universitat Rovira i Virgili: Vicenç Torra
 Web page: <http://www.maths.bath.ac.uk/~jap/VIM/>

Partners:

Christian Albrechts Universitaet Kiel, Germany.
 CNR, Istituto di Cibernetica, Naples, Italy.
 CSIC, Institut d'Investigació en Intel·ligència Artificial, Spain.
 GMD, FIRST, Berlin, Germany.
 GMD, FIT.KI, Bonn, Germany.
 Ilog S.A., France.
 INRIA, France.
 Università di Pisa, Dipartimento di Informatica, Italy.
 Università di Salerno, Dipartimento di Informatica ed Applicazioni, Italy.

Universitat Politècnica de Catalunya, Department of Computer Science, Spain.
University of Bath, Mathematical Sciences, U.K.
University of Southampton, Department of Electronics and Computer Science, U.K.
University of Warwick, U.K.
Vrije Universiteit Brussel, AI Lab, Belgium.

2. SMASH: Multi-agent systems for Medical Services in Hospitals

CICYT project (Spanish government): TIC96-1038-C04-04
From August 1996 to July 2001
Coordinator: Lluís Godo (IIIA-CSIC)
Main investigator at the Universitat Rovira i Virgili: Vicenç Torra
Web page: <http://www.iiia.csic.es/Projects/smash/>

Partners:

CSIC, Institut d'Investigació en Intel·ligència Artificial.
CSM - Consorci Sanitari de Mataró.
Universitat de Lleida.

2. hTechSight: A KM platform with intelligence and insight capabilities for technology intensive industries

IST project (EU government): IST-2001-33174
From April 2002 to Sept 2004
Coordinator: Antonis Kokossis (Univ. of Surrey)
Main investigator at the Universitat Rovira i Virgili: René Bañares (April 2002-Sept 2003), David Riaño (Oct 2003-Sept 2004)
Web page: <http://prise-serv.cpe.surrey.ac.uk/techsight/>

Partners:

University of Surrey
Universitat Rovira I Virgili
Institut für Informatik, Leopold-Franzens Universität Innsbruck
The University of Sheffield
Athens Technology Center S.A.
Institution of Chemical Engineers
BAYER AG
P.N. GEROLYMATOS S.A.
MAMIDOIL-JETOIL S.A.
Institut Français du Pétrole

3. Publications

3.1 International journals

1. Martínez-Miranda, Juan and Aldea, Arantza. Emotions in Human and Artificial Intelligence. Computers in Human Behaviour in Press. 2004
2. J. Martínez-Miranda, A. Aldea and R. Bañares-Alcántara. Agent Based Simulation in the Selection of Work Teams. Computación y Sistemas. Vol. 7 No. 3. Pp:210-23 Bárbaro J. Ferro (Ed.). 2004
3. A. Rodríguez-Martínez, I. López-Arévalo, R. Bañares-Alcántara and A. Aldea. Multi-model knowledge representation in the retrofit of processes. Special Issue of Journal of Computer Applications in Chemical Engineering. Vol. 28 Pp: 781-788 Elsevier.
4. I. López-Arévalo, A. Rodríguez-Martínez, R. Bañares-Alcántara and A. Aldea The Application of Ontologies in the Retrofit of Chemical Processes. Revista Mexicana De Ingeniería Química. Academia Mexicana de Investigación y Docencia en Ingeniería Química Vol 3. Pp: 39-53. 2004
5. A. Aldea, R. Bañares-Alcántara, L. Jiménez, A. Moreno, J. Martínez, D. Riaño. The scope of Application of Multi-Agent Systems in the Process Industry: Three Case Studies. Journal on Expert Systems with Applications 26 Pp: 34 - 47. 2004
6. Antonio Moreno, David Isern, David Sánchez. Provision of agent-based health care services. AI-Communications Special issue on agents applied in health care Volume 16, Number 3 Pp:167 - 178. 2003
7. Valls, A., Torra, V., Domingo, J. Semantic based aggregation for Statistical Disclosure Control. International Journal of Intelligent Systems, vol. 18 (9) Pp: 939 - 952. 2003

3.2 National Journals

8. S. Prado, D. Riaño, M. Olona, X. Allué. Gestión Clínica Basada en la Evidencia. Aplicación de Tecnologías de "Data Mining" en la Gestión Sanitaria. Gestión Hospitalaria 12(2) Pp: 40-47 2001

3.3. International conferences

9. Open Discussion Track Proceedings of IBERAMIA 2002 VIII Iberoamerican Conference on Artificial Intelligence., F. Garijo, J.C. Riquelme, M. Toro (eds) Pp: 1 - 10 Sevilla (Spain) 2002
10. Martínez-Miranda, Juan; Aldea, Arantza; and Bañares-Alcántara, René. Simulation of work teams using a Multi-Agent System. Proceedings of The Second International Joint Conference on Autonomous Agents & Multi Agent Systems, AAMAS 2003 Pp: 1064 - 1065 Melbourne (Australia) 2003.
11. J. Martínez-Miranda, A. Aldea and R. Bañares-Alcántara. A tool to support the configuration of work teams. Process Systems Engineering 2003 (Part B). B. Chen and A.W. Westerberg (eds.), Computer-Aided Chemical Engineering series, 15. Elsevier Science. Pp: 280 - 285 China 2003
12. Juan Martínez-Miranda, Arantza Aldea and René Bañares-Alcántara. Modelling Human Behaviour to Support the Integration of Work Teams. Proceedings of Workshop on Intelligent Computing, WIC 2004, L. Sheremetov and M. Alvarado, (Eds.) Pp: 91 - 99 Ciudad de México (México) 2004
13. Ivan López-Arévalo, Arantza Aldea y René Bañares-Alcántara. Modelado Múltiple en el Rediseño de Procesos Químicos. 8a. Conferencia Iberoamericana de Inteligencia Artificial (IBERAMIA 2002) , Open Discussion Track Proceedings. Pp: 21 - 30 Sevilla (Spain) 2002
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16. A. Rodríguez-Martínez, I. López-Arévalo, R. Bañares-Alcántara and A. Aldea. Retrofit Approach for Developing Sustainable Chemical Processes. 13th Annual Meeting of the Society of Environmental Toxicology and Chemistry in Europe (SETAC'03). Hamburg (Germany) 2003.
17. A. Rodríguez-Martínez, I. López-Arévalo, R. Bañares-Alcántara and A. Aldea Automatic Hierarchical Abstraction Tool for the Retrofit of Processes. 4th European Congress in Chemical Engineering (ECCE-4). Granada (Spain) 2003

18. I. López-Arévalo, A. Rodríguez-Martínez, R. Bañares-Alcántara and A. Aldea. Towards the Automatic Identification of Process Sections during the Redesign of Petroleum and Chemical Processes. 2nd Workshop on Intelligent Computing in the Petroleum Industry. Acapulco (México) 2003.
19. I. López-Arévalo, A. Rodríguez-Martínez, R. Bañares-Alcántara and A. Aldea. Ontologías: Desarrollo y Aplicación en Ingeniería Química. 32 XXV Encuentro de la Academia Mexicana de Investigación y docencia en Ingeniería Química. Puerto Vallarta (Mexico) 2004.
20. D. Riaño, S. Prado. A data-mining alternative to model hospital operations: filtering, adaptation, and behaviour prediction. First Int. Symposium in Medical Data Analysis. Pp: 293-299 Frankfurt (Germany) 2000.
21. D. Riaño, S. Prado. Improving HISYS1 with a Decision Support System. The Eighth European Conference on Artificial Intelligence in Medicine. Pp: 413 - 416 Cascais (Portugal) 2001.
22. D. Riaño, S. Prado. Application of Data Mining in Health Care. Int. ICSC Congress Computational Intelligence Methods and Applications. Pp: 154 - 158. Bangor (UK) 2001.
23. D. Riaño, S. Prado. The analysis of hospital episodes. Second Int. Symposium on Medical Data Analysis. Madrid (Spain) 2001
24. F. Borrell, D. Riaño, M. Sánchez-Marrè, I. R.-Roda. Implementation of a Multiagent Prototype for WWTP Management. International Environmental Modelling and Software Society. Lugano (Switzerland) 2002.
25. D. Riaño, S. Prado, A. Pascual, S. Martín. A Multiagent System Model to Support Palliative Care Units. 15th IEEE Symposium on Computer Based Medical Systems. Maribor (Slovenia) 2002.
26. D. Riaño, S. Prado. The Study of Medical Costs with Intelligent Information Systems. 15th IEEE Symposium on Computer Based Medical Systems. Maribor (Slovenia) 2002.
27. D. Riaño. Guideline Composition from Minimum Basic Data Set. The 16th IEEE Symposium on Computer-Based Medical Systems . Pp: 231 - 235 New York (USA) 2003.
28. D. Riaño, J. Gramajo. Medical Data Extraction and Organization from the Internet . The 16th IEEE Symposium on Computer-Based Medical Systems . Pp: 379 - 354 New York (USA) 2003.
29. A. Aldea, R. Bañares-Alcántara, J. Bocio, J. Gramajo, D. Isern, A. Kokossis, L. Jiménez, A. Moreno, D. Riaño. An Ontology-Based Knowledge Management Platform. IJCAI Workshop on Information Integration on the Web. Acapulco (Mexico) 2003.
30. D. Riaño, J.A. Bohada, T. Welzer. The DTP model: Integration of intelligent techniques for the decision support in Healthcare Assistance. Engineering of Intelligent Systems 2004. Pp: 256 - 261 Madeira Island (Portugal) 2004.
31. A. Kamicalic, T. Welzer, D. Riaño. Tools enabling creation of GRIDs. MIPRO 2004. Pp: 256 - 261 Opatija (Croatia) 2004.
32. A. Moreno, A. Valls, D. Riaño. Improving palliative care with agent technology. 2nd Workshop on Agents Applied in HealthCare, ECAI 2004. Pp: 121 - 126 Valencia (Spain) 2004
33. D. Riaño, A. Moreno, A. Valls. Palliasys: Agent Based Palliative Care. IEEE 4th Conf. on Intelligent Systems Design and Applications. Pp: 121 - 126 Budapest (Hungary) 2004
34. D. Riaño. Time-Independent Rule-Based Guideline Induction. ECAI 2004. Pp: 535 - 538 Valencia (Spain) 2004
35. J. A. Bohada, D. Riaño. A CPG-Based CBR model to offer the best available therapy. STAIRS 2004. Valencia (Spain) 2004
36. J. Bocio, D. Isern, A. Moreno, D. Riaño. Semantically grounded information search in the WWW. CCIA 2004. Barcelona (Spain) 2004.
37. A. Moreno, D. Riaño, D. Isern, J. Bocio, D. Sánchez. Agent-based semantic information search on the web. 3rd. Int. Workshop on Practical Applications of Agents and Multi-Agent Systems. Burgos (Spain) 2004
38. J. Bocio, A. Moreno, D. Riaño, D. Sánchez, L. Jiménez, R. Bañares-Alcántara. Ontology-based information retrieval. PAKM 2004. Viena (Austria) 2004.
39. D. Riaño. Ordered Time-Independent CIG Learning. ISBMDA 2004. Barcelona (Spain) 2004.
40. I. Aslanidis, D. Riaño. Finding Relationships in Medical Diagnoses and Procedures ISBMDA 2004. Barcelona (Spain) 2004.
41. David Isern, David Sánchez, Antonio Moreno, Aida Valls HeCaSe: an agent-based system to provide personalised medical services Workshop on Intelligent agents in the Third Millennium, in CAEPIA 2003. San Sebastián (Spain) 2003.
42. Moreno, A., Valls, A. GRUSMA1: Experience on the deployment of agent-based health care services. Applications of Software Agent Technology in Health Care Domain Whitestein Series in Software Agent Technologies, Nealon and Moreno (eds.), Birkhäuser Verlag. Pp: 49 - 66 2003
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45. Valls, A., Moreno, A., Sánchez, D. A multi-criteria decision aid agent applied to the selection of the best receiver in a transplant 4th. International Conference on Enterprise Information Systems (ICEIS) Pp: 431 - 438 Ciudad Real (Spain) 2002.
46. Valls, A., Torra, V., Domingo-Ferrer, J. Aggregation methods to evaluate multiple protected versions of the same confidential data set 1st. International Workshop on Soft Methods in Probability and Statistics. Pp: 355 - 362. Polonia (2002)
47. Valls, A., Moreno, A. Using multi-agent systems to help in organ transplant management 1st International Workshop on Health Care Applications of Intelligent Agents, Information Day 3 of the European project AgentCities. NET Barcelona (Spain) 2003
48. Isern, D., Sánchez, D., Moreno, A., Valls, A. HECASE: provision of secure personalised medical services First European Workshop on Multi-Agent Systems (EUMAS) UK 2003.
49. Isern, D., Sánchez, D., Moreno, A., Valls, A. Personalisation of medical services Application of computing science in medicine and health care (Instituto Politécnico Nacional) Pp: 18 - 31 Cuernavaca (Mexico) 2003.
50. Moreno, A., Valls, A., Marín M. Multi-agent simulation of work teams 3rd International/Central and Eastern European Conference on Multi-Agent Systems (CEEMAS), Lecture Notes in Computer Science. Pp: 281 - 291 Prague (Czech Republic) 2003
51. D. Riaño, J. M. Corchado. IJCAI'99 Workshop on Automating the Construction of Case-based Reasoners, Descriptive Rules Model for Learning and Pruning the Memory of CBR Systems, Stockholm, Sweden, 31st July to 6th August 1999.
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53. D. Riaño, F. Serratos. *Unsupervised Synthesis of Function-described Graphs*, 2nd Int. Workshop on Graph-based Representations in Pattern Recognition, Austria, May 1999.
54. E. de la Torre, D. Riaño. *Aplicació ESSAI: sistema didàctic de razonamiento aproximado*, 2n Congrés Català d'Intel·ligència Artificial (CCIA 1999). pp. 93-98, Girona, Spain. 1999.
55. J. Virgili, D. Riaño, C. Fyfe. *Aplicació de tècniques d'IA per resoldre el problema TSP*, 2n Congrés Català d'Intel·ligència Artificial (CCIA 1999). pp. 248-252, Girona, Spain. 1999.
56. D. Riaño. Learning Rules within the Framework of Environmental Sciences, W7: Binding Environmental Sciences and AI in ECAI98, Brighton, UK, August 1998.

3.4. National conferences

57. Ivan López-Arévalo, Arantza Aldea y René Bañares-Alcántara. Uso de HYSYS en la Abstracción y Retro fit de Procesos. Ir. Encuentro Universitario sobre Simulación de Procesos y Aplicaciones Hysys. Valencia (Spain) 2001
58. S. Prado, D. Riaño. Modelat del Comportament Hospitalari amb Tècniques de Data Mining. 3er Congrés Català d'Intel·ligència Artificial. Barcelona (Spain) 2000
59. D. Subies, I. Alcón, D. Riaño, B. Lees. Art-Market: sistema d'agents mòbils per a la compra-venda en Galeries d'Art. 3er Congrés Català d'Intel·ligència Artificial. Barcelona (Spain) 2000
60. S. Prado, D. Riaño. Aplicación de las nuevas tecnologías de la información para la obtención y uso de conocimiento hospitalario: ayuda a la toma de decisiones clínicas y administrativas. VIII Congreso Nacional de Informática Médica. Pp: 413 - 416. Toledo (Spain) 2000.
61. S. Prado, D. Riaño, M. Olona, X. Allué. Gestión Clínica Basada en la Evidencia. Aplicación de Tecnologías de "Data Mining" en la Gestión Sanitaria. XII

- Congreso Nacional de Hospitales. Pp: 154 - 158. Barcelona (Spain) 2001
62. F. Borrell, J. Bocio, D. Riaño, M. Sánchez-Marrè, I. R.-Roda. Sistema Multiagent de control d'una Planta Depuradora d'Aigües Residuals. Congrés Català d'Intel·ligència Artificial. Barcelona (Spain) 2001
 63. A.Pascual, D. Riaño, S. Prado, C. López, S. Martín. Un Modelo de Sistema Multiagente en un Programa de Cuidados Paliativos. Congreso Nacional de Paliativos Granada (Spain) 2002.
 64. D. Riaño, S. Prado, M. Olona, X. Allué, D. Pi. Sistema Informático para el cálculo de costes hospitalarios orientado al paciente: CCostes v2.1. INFORSALUD 2004. Pp: 256 - 261 Madrid (Spain) 2004.
 65. Moreno, A., Valls, A. Experiencia de realización de proyectos fin de carrera en el área de los sistemas multi-agente Jornadas de Enseñanza Universitaria de la Informática (JENUI). Cáceres (Spain) 2002
 66. Antonio Moreno, David Sánchez Security measures in a medical MAS VI Congrés Català d'Intel·ligència Artificial, CCIA 2003. Palma de Mallorca (Spain) 2003.
 67. Valls, A., Torra, V. Fusion of qualitative preferences with different vocabularies. 5è Congrés Català d'Intel·ligència Artificial (CCIA). Pp: 137 - 144 Castelló (Spain) 2002.
 68. Valls, A., Torra, V. Describing Preferences with a Negation-based Vocabulary 6è Congrés Català d'Intel·ligència Artificial (CCIA). Pp: 51 - 61. Mallorca (Spain) 2003
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