

Frontiers
in
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Intelligence
and
Applications

ARTIFICIAL INTELLIGENCE RESEARCH AND DEVELOPMENT

Edited by
Monique Polit
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Artificial Intelligence Research and Development

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Preface

Artificial Intelligence (AI) forms an essential branch of computer science. The field covered by the IA is multiform and gathers subjects as various as the engineering of knowledge, the automatic treatment of the language, the training, the systems multi-agents, to quote only some of them. The history of the AI knew various periods of evolution passing from periods of doubt at very fertile periods. AI is now in its maturity and did not remain an isolated field of computer science, but approached various fields like statistics, data analysis, linguistics and cognitive psychology or databases. AI is focused on providing solutions to real life problems and is used now in routine in medicine, economics, military or strategy games...

The Catalan Association for Artificial Intelligence (ACIA¹), with the aim of joining together the researchers of the AI community, organizes an annual conference to promote synergies in the research community of its influence.

The advances made by ACIA people and its influence area have been gathered in this single volume as an update of previous volumes published in 2003, 2004 and 2005 (corresponding to numbers 100, 113 and 131 of the series “Frontiers in Artificial Intelligence and Applications”).

The book is organized according to the different sessions in which the papers were presented at the ninth International Conference of the Catalane Association for artificial Intelligence, held in Perpignan (France) on October 26–27th, 2006, namely: Machine Learning, Reasoning, Neural Networks, Computer Vision, Planning and Robotics and Multiagent Systems. For the first time this conference has been organized in the “French Catalonia” and we want to thank the ACIA for confidence that they granted to us. Papers have been selected after a double blind process in which distinguished AI researchers participated. The quality of papers was high on average. All the papers collected on this volume would be of interest to any computer scientist or engineer interested in AI.

We would like to express our sincere gratitude to all the authors and members of the scientific and organizing committees that have made this conference a success. We also send special thanks to the invited speakers for their effort in preparing the lectures.

Perpignan, October 2006

Monique Polit (University of Perpignan)
Joseph Aguilar-Martin (LAAS/CNRS, Toulouse)
Beatriz López (University of Girona)
Joaquim Meléndez (University of Girona)

¹ ACIA, the Catalan Association for Artificial Intelligence, is member of the European Coordinating Committee for Artificial Intelligence (ECCAI). <http://www.acia.org>.

Conference Organization

CCIA 2006 was organized by:
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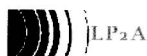
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Invited Talks

Application of expert systems in medicine

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Abstract

In this talk, we will present some development of expert system for decision-making in diagnosis and treatment in medicine. These systems guide the user to collect easily the patient information, based on those information points that can lead to a possible diagnose and to the adapted treatment of the diseases. They guide the user during the medical examination (physical) that will be done on the patient showing the definitions, images, sounds and/or videos of the signs associated to their disease and verify that the doctor does not forget to examine none of the criteria diagnoses even though is the first time that he sees or knows this sign.

Once the patient data collected, the diagnose is based on the stored medical knowledge. The data on symptoms or signs, special data of laboratory or tests or radiological images are process by the system using defined rules to obtain the possible diagnoses. Additional data such as the presence or absence of certain signs and symptoms help to make a final diagnose. The rules of these Expert systems include the diagnose criteria from world-wide Associations, as well as algorithms designed by members of the Laboratory of Intelligent Systems of the University of The Andes. The qualities of this system are:

1. It can diagnose of one or more diseases and suggests the appropriate therapy.
2. It diagnoses the absolute absence of anyone of these diseases.
3. It can find some symptoms or signs due to any exogenous cause (a differential diagnose).
4. It notifies to the doctor that the patient does not fill the minimum criteria for some of the diseases and in this case, suggests a new evaluation.
5. It suggests send the patient to a specialist.

The reasoning for establishing diagnoses or hypotheses of diagnoses is given as well as the plans for other examinations and for patient treatment. Also it is indicated when there are inexplicable signs, symptoms or laboratory data. They include the realization of a set of questions individualized for each subject and the selection of data that is going to be acquired answering the questions.

About the speaker

Francklin Rivas Echeverría. Associated professor at the "Universidad de Los Andes " (ULA) in Mérida, Venezuela. Engineer in Systems, Scientific magister in control engineering and PHD in Applied Sciences. Actually, he is Director of the Intelligent System Laboratory in ULA; He is co-editor of the book " Introduction to the techniques of Intelligent Computing and co-author of the book "Control of non-linear systems" published by "Pearson Education". He is the author of more than 100 papers in reviews or conference proceedings. He has directed more than 50 theses. His is member of scientific committee of various conferences and reviewer of some reviews and of national and international programs

From Artificial Intelligence to Natural Stupidity (and Back) in only Fifty Years

Ton Sales

About the speaker

Ton Sales was Professor of Logic and Artificial Intelligence at the School of Computer Science in the Technical University of Catalonia (UPC) Barcelona. He is actually retired.

