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Innovations in Hybrid Intelligent Systems — Source link

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Innovations in Hybrid Intelligent Systems

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Preface

The 2nd International Workshop on
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This volume of Advances in Soft C
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Since its first edition in Brazil in 2
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HAIS 2007 received 112 technic
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The large number of submitted pa
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conferences.

HAIS 07 has also teamed up with
Hybrid Artificial Intelligent Systems
HAIS 2007. The extended papers, t
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We would like to thank the work o
formed admirably under tight deadli
our Keynote Speakers: Prof. Ajith A
Technology, Norway, and Prof. Jo
Madrid, Spain.

Particular thanks go to the Organis
sation and promotion of HAIS 2007.

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Combining Improved FYDPS Neural Networks and Case-Based Planning – A Case Study

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Abstract. This paper presents a hybrid deliberative architecture based on the concept of CBP-BDI agent. A CBP-BDI agent is a BDI agent that incorporates a CBP reasoning engine. The work here presented focuses in the development of the CBP internal structure. The planning mechanism has been implemented by means of a novel FYDPS neural network. The system has been tested and this paper presents the results obtained.

1 Introduction

In this article we present a novel hybrid planning system based on the combination of neuronal networks with CBP (Case-based planning) systems [8]. CBP allows us to retrieve past experiences when a new plan is created which lends the system a large capacity for learning and adaptation [8]. The neuronal networks proposed within this research framework are self-organised, based on Kohonen [11] networks, but which present certain improvements (FYDPS neural Neural Network) [13]. These improvements allow the network to reach a solution much more rapidly. Furthermore, once a solution has been reached, it makes it possible to make new modifications taking restrictions into account (specifically time restrictions).

Case-based planning is based on the way through which a new plan is generated through experiences acquired in the past (after the creation and execution of plans to resolve similar problems to the current one). Case-based planning is carried out through a CBP cycle [2], [3], [8]. The CBP cycle is formed by four sequential stages: retrieve, reuse, revise and retain. In the retrieve stage past experiences are recuperated with a description of the problem similar to that of the current problem. In the revise stage the results attained after executing a new plan are evaluated. Lastly, in the retain stage, lessons are learnt from the new experience. Each one of the stages of the CBP cycle may be implemented in various ways, using different algorithms. In this article we present a novel model that allows the integration of the planning based on cases from FYDPS networks. This model offers greater speed for obtaining the solutions that Kohonen networks, and incorporated restrictions in the network.

The hybrid planning system developed has been applied to an existent Multiagent System, developed for guiding and advising users in Shopping Centres (also known as shopping malls) [2], [3]. A shopping centre is a dynamic environment, in which shops change, promotions appear and disappear continuously, etc. The proposed system

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helps users to identify a shopping or le
within a given shopping mall. Mu
recommended for solving dynamic di
deliberative agent that works at a high
Intention (BDI) [2], [9]. A CBP-BDI ag
mechanism, which allows it to learn fro
with the environment as well as with use
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Section two presents the shopping m
three introduces the planning strategy
neural network model finally, the system

2 Shopping Mall Multiagent Sy

This paper presents a distributed archite
of a CBP-BDI guiding agent, wireless ag
BDI agent incorporates a reasoning Cas
the agent to learn from initial knov
environment and users, and allows it
discovering knowledge "know how". T
recommending plans in dynamic enviro
to develop a guiding system for the u
identify bargains, offers, leisure activit
developed, which is capable of incorpor
and advice services to the users not onl
similar environment such as the labour
Users (clients in the mall) are able to g
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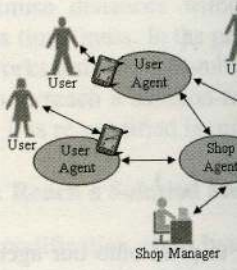

Fig. 1. Shopping Mall multiagent system

In terms of the efficacy obtained with the new planning model, the results of the new model have been compared with those of a classic planner and with the prior system. A set of synthetic tests has been developed, proposing 50 cases for generating a plan in each planner. The average times taken by each planner to generate a plan is illustrated in Table 2. Table 2 shows how the planner proposed in this study significantly improves the time taken over classical planner, and also slightly improves on the time taken by a geodesic based planner.

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Autonomous FYDPS Neural Network-Based Planner Agent for Health Care in Geriatric Residences

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Abstract. This paper presents an autonomous intelligent agent developed for health care in geriatric residences. The paper focuses on the construction of an autonomous agent which incorporates a model of human thinking, such as reasoning based on past experiences. The work here presented focuses in the development of the CBP internal structure. The planning mechanism has been implemented by means of a novel FYDPS neural network. The system has been tested and this paper presents the results obtained.

Keywords: Multi-agent System, CBR, FYDPS neural network.

1 Introduction

In this article we present a novel planning system based on the combination of neuronal networks with CBP (Case-based planning) systems [7]. Case-based planning allows us to retrieve past experiences to create a new plan which lends the system a large capacity for learning and adaptation [7]. The neuronal networks proposed within this research framework are self-organised, based on Kohonen networks [10], but present certain improvements (FYDPS Neural Network) [11]. These improvements allow the network to reach a solution much more rapidly. Besides, once a solution has been reached, it is possible to make modifications taking restrictions into account (in this study time restrictions). The new planning mechanism is integrated within AGALZ (Autonomous aGent for monitoring ALZheimer patients) [5], [6], a planning agent that works in conjunction with complementary agents into a prototype multi-agent system (ALZ-MAS: ALZheimer Multi-Agent System). The results obtained are compared to those obtained with the previous geodesic planner used by AGALZ.

This work focuses in the development of deliberative agents using a case-based planning [1] architecture, as a way to implement adaptive systems to improve assistance and health care support for elderly and people with disabilities, in particular with Alzheimer's. Agents in this context must be able to respond to events, take the initiative according to their goals, communicate with other agents, interact with users, and make use of past experiences to find the best plans to achieve goals, so we propose the development of a deliberative agent that incorporates a CBP mechanism, specially designed for planning construction. CBP-BDI facilitates learning and

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In the future, health care will require the use of new technologies that allow medical personnel to carry out their tasks more efficiently [3]. We have shown some potential of deliberative CBP-BDI agents in a distributed multi-agent system focused on health care. In addition, the use of RFID technology [15] on people provided a high level of interaction among users and patients through the system.

Acknowledgements. This work has been partially supported by the MCYT TIC2003-07369-C02-02 and the JCYL-2002-05 project SA104A05. Special thanks to Sokymat by the RFID technology provided and to Telefónica Móviles (Movistar) for the wireless devices donated.

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Structure-Preserving Noise F Imaging

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Abstract. An approach for noise filtering based The method combines edge-preserving noise structures and a mechanism to further smooth with its application to electron cryotomography molecular architecture of complex biological sp to increase the extremely low signal-to-noise the three-dimensional structures. The filtering reducing the noise with excellent preservation

1 Introduction

The advent of biological imaging technol or indirectly, the molecular and cellular essential functions within cells and tiss techniques (optical microscopy, confocal tomography, just to name a few) in biolo the need for sophisticated image proce interpretation at different scales of resol even needed for analysis of other biologic

Noise reduction is paramount for pro images. Standard linear filtering techni kernels succeed in reducing the noise, bu Anisotropic nonlinear diffusion (AND) i reduction techniques [3]. AND achieves tunes the strength and direction of the sm image. It preserves edges and enhances the signal-to-noise ratio (SNR) with no si in 1990 by Perona and Malik [4], in the well-established tool for denoising multid

Electron cryotomography (cryoET) molecular architecture of biological sp produces extremely low contrast three-

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Innovations in Hybrid Intelligent Systems

Hybrid Artificial Intelligence Systems (HAIS) combines symbolic and sub-symbolic techniques to construct more robust and reliable problem solving models. This volume focused on "Hybrid Artificial Intelligence Systems" contains a collection of papers that were presented at the 2nd International Workshop on Hybrid Artificial Intelligence Systems, held in 12–13 November, 2007, Salamanca, Spain. This carefully edited book provides a comprehensive overview of the recent advances in the hybrid intelligent systems and covers a wide range of application areas, including data analysis and data mining, intelligent control, pattern recognition, robotics, optimization, etc. The book is aimed at researchers, practitioners and postgraduate students who are engaged in developing and applying advanced intelligent systems principles to solving real-world problems.

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