Rosina O. Weber
Michael M. Richter (Eds.)

Case-Based Reasoning Research and Development

LNAI 4626

7th International Conference
on Case-Based Reasoning, ICCBR 2007
Belfast, Northern Ireland, UK, August 2007, Proceedings

Springer

Series Editors

Jaime G. Carbonell, Carnegie Mellon University, Pittsburgh, PA, USA
Jörg Siekmann, University of Saarland, Saarbrücken, Germany

Volume Editors

Rosina O. Weber
The iSchool at Drexel
College of Information Science & Technology
3141 Chestnut Street, Philadelphia, PA 19104, USA
E-mail: rweber@ischool.drexel.edu

Michael M. Richter
TU Kaiserslautern
Department of Computer Science
P.O. Box 3049, 67618 Kaiserslautern, Germany
E-mail: richter@informatik.uni-kl.de

Library of Congress Control Number: 2007932197

CR Subject Classification (1998): I.2, J.4, J.1, F.4.1

LNCS Sublibrary: SL 7 – Artificial Intelligence

ISSN 0302-9743
ISBN-10 3-540-74138-0 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-74138-1 Springer Berlin Heidelberg New York

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12105106 06/3180 5 4 3 2 1 0

The International Conference on C
international meeting on cas
(http://www.iccbr.org./iccbr07/) wa
significant contributions in the fiel
Northern Ireland, UK, during Augu
ECCBR (European Conference o
ICCBR followed a series of six succ
Sesimbra, Portugal (1995); Provide
(1999); Vancouver, Canada (2001
nois, USA (2005). The European
were held as European workshop
France (1994); Lausanne, Switzerl
Italy (2000); and as European con
(2004); and Lykia World, Turkey (2

Days one, two, and four compris
plied CBR research. In order to en
tional industry day was converted i
the middle of the conference. Day
Reasoning and Context-Awareness
Textual Case-Based Reasoning: Be
Based Reasoning; and Knowledge I

There were four distinguished in
munity, David W. Aha (Naval Rese
CBR, while Eva Armengol (IIIA-C
in CBR. Hans-Dieter Burkhard (Hu
cases in robotic soccer, and Larry
sented the role of XML databases i

The presentations and posters co
planning, learning, similarity, main
This volume includes 15 papers fr
were chosen from a total of 64 subr
addition, the volume contains three
were chosen based on a thorough a
reviewed and discussed by four revi

There were many people who pa
David W. Patterson (University o
Chair who had the initiative to prop
diverse, having David C. Wilson (
Khemani (IIT Madras, India) as
Roth-Berghofer (DFKI, Germany)
Program that included Kareem S

Table of Contents

Invited Papers

Research Papers

Application Papers

Intelligent Guidance and Suggestions Using Case-Based Planning

Javier Bajo[1], Juan Manuel Corchado[2], and Sara Rodríguez[2]

[1] Universidad Pontificia de Salamanca
Compañía 5, 37002, Salamanca, Spain
jbajope@upsa.es
[2] Departamento Informática y Automática
Universidad de Salamanca
Plaza de la Merced s/n, 37008, Salamanca, Spain
{corchado,srg}@usal.es

Abstract. This paper presents a multiagent system that provides guidance on leisure facilities and suggestions for shopping in malls. This paper presents a deliberative agent which incorporates a case based planner that provides suggestions in execution time. This agent is described together with its guidance and suggestion mechanism. The multiagent system has been tested, and the results obtained are presented in this paper.

Keywords: Planning; Learning; Shopping mall multiagent system; RFID.

1 Introduction

A shopping centre is a dynamic environment, in which shops change, promotions appear and disappear continuously, etc. This paper presents a multiagent system, developed for guiding and advising users in Shopping Centres (also known as shopping malls). The proposed system, SHOpping MulitAgent System (SHOMAS), helps users to identify a shopping or leisure plan as well as to identify other users within a given shopping mall. SHOMAS is an open wireless multiagent system and users require a wireless device (mobile or PDA) to download their own agent and to interact with the multiagent system. The user agents interact directly with a deliberative Case-Based Planning - Beliefes Desires Intentions (CBP-BDI) guiding agent which uses a case-based reasoning (CBR) [1], [21] architecture, that allows it to respond to events, to take the initiative according to its goals, to communicate with other agents, to interact with users, and to make use of past experiences to find the best plans to achieve goals. Moreover, SHOMAS incorporates Radio Frequency Identification (RFID) [28] technology to ascertain users' location in order to provide security and to optimize their time in the mall.

The core of SHOMAS is the CBP-BDI guiding agent. This particular agent uses a special type of CBR systems which we call Case-Base Planning (CBP) [12] system, specially designed for planning construction. CBP-BDI agent is a deliberative agent that works at a high level with the concepts of Believe, Desire, Intention (BDI) [7].

R.O. Weber and M.M. Richter (Eds.): ICCBR 2007, LNAI 4626, pp. 389–403, 2007.

13. Cumby, C., Fano, A., Ghani, R., Krema, M.: Building intelligent shopping assistants using individual consumer models. In: Proc. IUI 2005 ACM, New York, pp. 323–325 (2005)
14. Eriksson, J., Finne, N.: MarketSpace: an open agent-based market infrastructure, Uppsala Master's thesis in Computing Science 106, Examensarbete DV3 (1997)
15. Fano, A.E.: Shopper's Eye: Using location-based Filtering for a shopping agent in the physical world. In: Proc. of the Second International Conference on Autonomous Agents, pp. 416–421 (1998)
16. Fonseca, S.P., Griss, M.L., Letsinger, R.: An Agent Mediated E-Commerce Environment for the Mobile Shopper, Hewlett-Packard Laboratories, Technical Report, HPL-2001-157 (2001)
17. Ga, M.: Agents in E-commerce. In: Communications of the ACM, vol. 42(3), pp. 79–80. ACM Press, New York (1999)
18. Giampapa, J.A., Sycara, K.: Conversational Case-Based Planning for Agent Team Coordination. In: Aha, D.W., Watson, I. (eds.) ICCBR 2001. LNCS (LNAI), vol. 2080, pp. 189–203. Springer, Heidelberg (2001)
19. Giampapa, J.A., Sycara, K.: Team-Oriented Agent Coordination in the RETSINA Multi-Agent System. In: AAMAS 2002 Workshop on Teamwork and Coalition Formation. Robotics Institute, Carnegie Mellon University, Pittsburgh, PA (2002)
20. Glez-Bedia, M., Corchado, J.M., Corchado, E., Fyfe, C.: Analytical Model for Constructing Deliberative Agents. Engineering Intelligent Systems 3, 173–185 (2002)
21. Hammond, K.: Case-based planning: Viewing planning as a memory task. Academic Press, Boston, MA (1989)
22. Kim, J., LaRose, R.: Interactive e-commerce: Promoting consumer efficiency or impulsivity? Journal of Computer-Mediated Communication 10 (2004)
23. Kowalczyk, R., Ulieru, M., Unland, R.: Integrating Mobile and Intelligent Agents in Advanced e-Commerce: A Survey. In: Kowalczyk, R., Müller, J.P., Tianfield, H., Unland, R. (eds.) Agent Technologies, Infrastructures, Tools, and Applications for E-Services. LNCS (LNAI), vol. 2592, pp. 295–313. Springer, Heidelberg (2003)
24. Maes, P., Guttman, R., Moukas, A.: Agents That Buy and Sell. Communications of the ACM 42(3), 81–91 (1999)
25. Muñoz-Avila, H., Aha, D.W.: On the role of explanation for hierarchical case-based planning in real-time strategy games. In: Gervás, P., Gupta, K.M. (eds.) Proceedings of the ECCBR 2004 Workshops (2004) (Technical Report 142-04)
26. Pokahr, A., Braubach, L., Lamersdorf, W.: Jadex, Implementing a BDI-Infrastructure for JADE Agents. In: EXP - In Search of Innovation (Special Issue on JADE) September 2003, vol. 3(3), pp. 76–85. Telecom Italia Lab, Turin, Italy (2003)
27. Shung, H.H.: Helping Online Customers Decide through Web Personalization. IEEE Intelligent Systems 17(6), 34–43 (2002)
28. Sokymat (2007), http://www.sokymat.com
29. Veloso, M., Muñoz-Avila, H., Bergmann, R.: Case-Based Planning: Selected Methods and Systems. AI Commun. 9(3), 128–137 (1996)
30. Yoshino, T., Muta, T., Munemori, J.: NAMBA: location-aware collaboration system for shopping and meeting. IEEE Trans. on Consumer Electronics 48(3), 470–477 (2001)

Lecture Notes in Artificial Intelligence

Subseries of Lecture Notes in Computer Science

The LNAI series reports state-of-the-art results in artificial intelligence research, development, and education, at a high level and in both printed and electronic form. Enjoying tight cooperation with the R&D community, with numerous individuals, as well as with prestigious organizations and societies, LNAI has grown into the most comprehensive artificial intelligence research forum available.

The scope of LNAI spans the whole range of artificial intelligence and intelligent information processing including interdisciplinary topics in a variety of application fields. The type of material published traditionally includes

- proceedings (published in time for the respective conference)
- post-proceedings (consisting of thoroughly revised final full papers)
- research monographs (which may be based on PhD work)

More recently, several color-cover sublines have been added featuring, beyond a collection of papers, various added-value components; these sublines include

- tutorials (textbook-like monographs or collections of lectures given at advanced courses)
- state-of-the-art surveys (offering complete and mediated coverage of a topic)
- hot topics (introducing emergent topics to the broader community)

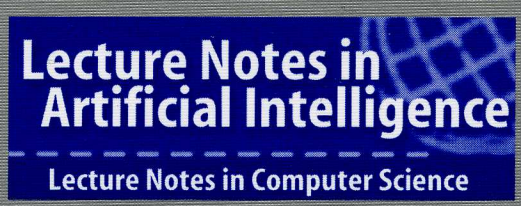
In parallel to the printed book, each new volume is published electronically in LNCS Online.

Detailed information on LNCS can be found at
www.springer.com/lncs

Proposals for publication should be sent to
LNCS Editorial, Tiergartenstr. 17, 69121 Heidelberg, Germany
E-mail: lncs@springer.com

ISSN 0302-9743

ISBN 978-3-540-74138-1



springer.com