BOOK REVIEW
E-LEARNING PARADIGMS AND APPLICATIONS
Agent-Based Approach
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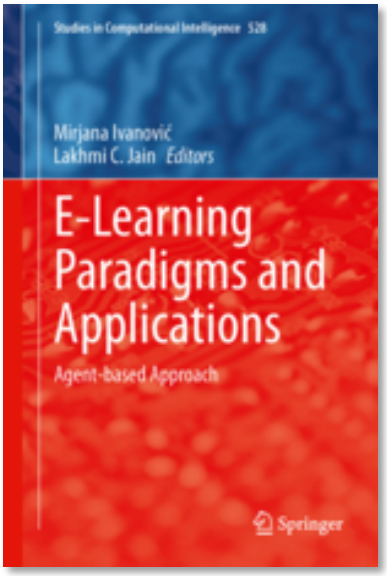

E-learning involves the use of digital technology applications in learning and teaching processes, and grows out of an interdisciplinary field, in which are contained a variety different approaches and components. Since the field of e-learning requires the use of high-level technology, it is very much affected by technological developments. Software agents are computer systems that have features such as autonomy, reactivity, intentionality and interactivity. The integration of software agents into e-learning mediums strengthens e-learning systems and allows for higher quality learning outcomes.

In this book, "E-Learning Paradigms and Applications: Agent-based Approach", which is the 528th volume of the "Studies in Computational Intelligence" series, the focus is on an agent-based approach, and shifts in e-learning paradigms and innovative applications. Editorship of the book has been jointly assumed by Mirjana Ivanovic´ from the Department of Mathematics and Informatics at the University of Novi Sad and Lakhmi C. Jain of the Faculty of Education, Science, Technology and Mathematics at the University of Canberra. The book contains 9 chapters and 273 pages. In each chapter, e-learning applications are associated with different software agents. The chapters reflect on the e-learning fields of robotics, artificial intelligence, game-based systems, fuzzy-logic, mobile learning, augmented reality, virtual reality, virtual learning environments, collaborative learning, grid services, pedagogical interface agents, the importance of quality and fit-to-purpose open educational resources, new e-

assessment approaches in e-learning, and emotional agents. The applicability of innovative ideas to e-learning systems is discussed in general throughout the book. The book argues that educational practices supported by software agents improve the learning process and produce positive learning outcomes.

In the first chapter of the book a system called RoboNewbie is introduced, which is a product of artificial intelligence. Being different from other Robotics experiments, the authors outline the RoboNewbie experiments to be lacking in danger, independent of any special hardware, low cost and easy to understand. Since there are certain requirements involved in making real robots, simulated virtual robots were used. The constructed framework was used in e-learning environments and tested in different conditions and with different participants. In this way the usability of e-learning systems integrated with artificial intelligence and the field of robotics is proven. The RoboNewbie project can be considered an impressive example of how (particularly simulated) humanoid robots will enrich and strengthen e-learning environments.

In the 2nd chapter intelligent agents are designed and game-based modules are used for e-learning purposes. It is claimed that intelligent agents and fuzzy logic are the most important components for e-learning environments, and a game-based learning system is built on these two foundations. The authors mention that this work, which is related to intelligent agent models that are developed and used for adaptive game-based learning and virtual learning environments, will be applied in learning management systems such as Moodle. At the end of the study, it is observed that, according to the data gathered in a Computer Science Course, game-based modules can be effective in e-learning processes.

In the 3rd chapter, based on the idea that e-learning could be a solution to protecting cultural heritage, the authors introduce a mobile augmented reality-based e-learning system, which is supported by social media integration. It is emphasized that when software agents are integrated with artificial intelligence, some intelligent educational applications will be created, and particularly narrative tools, digital storytelling and virtual reality applications are examples of complex applications produced by software agents. In this chapter, in addition to software agents, other components of the Agent-Based Learning Paradigm are elaborated in detail. In this study, in which artificial intelligence elements are integrated with software agents, it is concluded that software agents are effective in the development, application and assessment of e-learning tools.

In the 4th chapter problems in inter-university collaboration and cooperation are emphasized, and the virtual learning environment ITC-Euromaster (ITCEM) is introduced. In this study, which was prepared as a case study, the objective is to enhance cooperation between ITCEM and distributed students, and instructors living in different nations and continents, and to develop effective e-learning environments.

In the 5th chapter, based on the notion that e-learning services should be scalable, flexible and secured, Grid environments are introduced with the aim that geographically dispersed users utilize their resources in a dynamic, distributed, and heterogeneous way. Within this context, an agent-based e-learning framework for Grid services has been developed.

In the 6th chapter it is asserted that pedagogical interface agents could solve the problem of deficiency in computer literacy, seen as one of the biggest problems in developing countries. The authors applied pedagogical interface agents to adult learners to improve their computer usage skills and reached the conclusion that, compared to traditional teaching methods, the use of interface agents are more effective from the perspective of knowledge, attitude and aspiration.

The 7th chapter discusses the importance of open educational resources and open courseware for instructors and learners. It then underlines that learning materials in these resources should

be appropriate to requirements and should be of high quality. However, acknowledging that this process is difficult, a system called MASECO has been developed. As a multi-agent system, MASECO allows for the assessment and classification of educational materials, and provides instructors and learners with high quality educational materials which are appropriate to requirements. In addition to introducing MASECO the authors emphasize the importance of quality assurance with regard to educational resources.

In the 8th chapter the authors concentrate on adaptive testing and an innovative assessment approach in online learning. The adaptive testing in the developed online learning tool contains some software agents and defines different behavioral patterns. The study presents clues regarding how e-assessment systems will be constructed and how e-testing will be implemented in e-learning systems.

In the 9th and final chapter, research is presented about how emotional agents are used in e-learning environments. The author laments the difficulty of the group decision-making process, and discusses personality, emotions and mood agents that are important in group-wide decision-making processes. The author then tackles patience and experience as constituents in emotional agents. The study offers an example of how emotional agents are used in e-learning. E-learning is a field which can be used with many different technologies and which contains many components. This book presents a variety of innovations in traditional learning methods, and concentrates on new applications and paradigm shifts in regards to the field of e-learning, all of which enrich current learning environments. The authors share their results and experiences, obtained by the integration of software agents and e-learning tools. All the chapters in the book have been prepared on the basis of an agent-based approach, but each offers a different perspective. Different experiences and perspectives enhance the value of the book, and provide a diversity of opinions. This book, which is grounded on discussion of how e-learning systems can be made more effective and stronger via software agents, will be a highly useful reference source, particularly for those who work or who want to work in the fields of Computer Science, Open and Distance Education, and Educational Technology. Due to the multidisciplinary nature of e-learning, this book has the potential to appeal to many different audiences, including postgraduate students, instructors and researchers, in a diverse range of fields.

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