Intelligent and Adaptive Educational-Learning Systems

Achievements and Trends
Intelligent and Adaptive Educational-Learning Systems: Achievements and Trends
A. Peña-Ayala, WOLNM & IPN of México, Osaka University of Japan (Ed.)

A book of the Springer series: Smart Innovation, Systems and Technologies

SCOPE
This book is devoted to the interdisciplinary community at the frontiers of the fields of artificial intelligence, web technologies, education, pedagogic, psychology and cognitive sciences, who carry out rigorous research and applications devoted to the Intelligent and Adaptive Educational-Learning Systems. So the book covers the basic theories, architectures, paradigms, approaches and case studies of such a field.

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Educational learning systems (ELS) represent computer-based approaches devoted to spread educational services for teaching and learning mainly through the Internet. When the development of ELS accounts artificial intelligence techniques (e.g., acquiring and representing knowledge, make inferences and automatic learning) they become intelligent.

ELS are adaptive, once they pursue to adapt themselves to satisfy users’ needs, such as: navigation, interaction, content authoring, delivering, sequencing, assessment, evaluation, assistance, supervision, collaboration… Hence, ELS that include some kind of intelligent and adaptive functionality are called: intelligent and adaptive ELS (IALES).

This book reveals a sample of current work in the IALES, where researchers and practitioners of fields such as pedagogy, education, computer sciences, artificial intelligence, and graphic design join efforts to outcome frameworks, models, methods, systems and approaches for innovate the provision of education and enhance the learning of students.

This book is devoted to the “Intelligent and Adaptive Educational-Learning Systems”. It privileges works that highlight key achievements and outline trends to inspire future research.

This volume is the result of one year of effort, where more than forty chapters were rigorous peer reviewed by a set of ninety reviewers. After several cycles of chapter submission, revision and tuning based on the KES International quality principles, twenty works were approved and organized into four sections: Modeling, content, virtuality and applications.

Authors, reviewers and editors of this book expect this volume is of interest to researchers, practitioners, professors and postgraduate students aimed to update their knowledge and find out targets for future work in the field of artificial intelligence on education.
A. Peña-Ayala, Unidad Profesional Zacatenco, Mexico City, Mexico (Ed.)

Intelligent and Adaptive Educational-Learning Systems
Achievements and Trends

▶ Provides a holistic view of the computers in education paradigms and approaches
▶ Presents the underlying components of the Educational-Learning Systems
▶ Written by leading experts in the field

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This book is devoted to the “Intelligent and Adaptive Educational-Learning Systems”. It privileges works that highlight key achievements and outline trends to inspire future research. After a rigorous revision process twenty manuscripts were accepted and organized into four parts as follows:

- **Modeling:** The first part embraces five chapters oriented to: 1) shape the affective behavior; 2) depict the adaptive learning curriculum; 3) predict learning achievements; 4) mine learner models to outcome optimized and adaptive e-learning objects; 5) classify learning preferences of learners.
- **Content:** The second part encompasses five chapters aimed to: 6) provide adaptive guidance and personalized content; 7) adaptively select learning objects; 8) collaboratively generate learning objects; 9) automatic development of reusable adaptive content; 10) deploy intelligent tutoring systems as learning objects.
- **Virtuality:** The third part holds four chapters dedicated to: 11) explain how Second Life was used to promote collaborative writing; 12) acquire knowledge within a smart home environment; 13) share experiences of adaptive training virtual systems; 14) reveal how an agent is used in a simulation-based tutoring system for learning the complex task of operating a robotic arm.
- **Applications:** The fourth part owns six chapters concerned about: 15) an agent-based way to design scaffolding to prompt reflection; 16) the stimulation of self-regulated to learn higher order knowledge; 17) a web-mediated training system design architecture; 18) a decision making model upon the quality of the collaboration; 19) a dynamic storyboarding system to support academic process; 20) an analysis of educational and business effects of artificial intelligence application on education.

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