Fuzzy Logic-Based Modeling in Collaborative and Blended Learning

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Description:

Technology has dramatically changed the way in which knowledge is shared within and outside of traditional classroom settings. The application of fuzzy logic to new forms of technology-centered education has presented new opportunities for analyzing and modeling learner behavior.

**Fuzzy Logic-Based Modeling in Collaborative and Blended Learning** explores the application of the fuzzy set theory to educational settings in order to analyze the learning process, gauge student feedback, and enable quality learning outcomes.

This premier reference monograph presents key research on educational data analysis and modeling through the integration of research on advanced modeling techniques, educational technologies, fuzzy concept maps, hybrid modeling, neuro-fuzzy learning management systems, and quality of interaction.

Readers:

This publication is an essential reference source for educators, researchers, educational administrators and designers, and IT specialists.


Topics Covered:

- Advanced Modeling Techniques
- Data Modeling
- Educational Data Analysis
- Educational Technologies
- Fuzzy Concept Maps
- Hybrid Modeling
- Learning Management Systems
- Quality of Interaction

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PART I: EDUCATIONAL-ICT BACKGROUND
CHAPTER 1: Placing the Framework within the Educational Context
CHAPTER 2: Understanding Online Learning Environments (OLEs)
CHAPTER 3: Computer-Supported Collaborative Learning: A Holistic Perspective
CHAPTER 4: Towards Blending Potentials within a Learning Management System: Definitions, Issues and Trends
CHAPTER 5: Personal/Cloud Learning Environment, Semantic Web 3.0 & Ontologies

PART II: FUZZY LOGIC: DEFINITIONS AND INFERENCE SYSTEMS
CHAPTER 6: Placing the Framework within the Fuzzy Logic World
CHAPTER 7: Fuzzy Logic Essentials
CHAPTER 8: Fuzzy Logic-based Inference Systems

PART III: FIS-BASED MODELING APPROACHES IN LEARNING
CHAPTER 9: Connecting the Educational and Fuzzy Worlds
CHAPTER 10: FIS-based Collaborative/Metacognitive Data Modeling
CHAPTER 11: ANFIS-based Collaborative/Metacognitive Data Modeling
CHAPTER 12: FIS/IFIS Modeling in Professional and Collaborative Learning: A Systemic Approach
CHAPTER 13: Embracing Macro-, Meso-, and Micro-levels of Analysis of FIS-based LMS Users’ Quality of Interaction
CHAPTER 14: FCM-based Modeling of LMS users’ Quality of Interaction

PART IV: OVERALL PERSPECTIVE
CHAPTER 15: Towards a Hybrid Modeling
CHAPTER 16: Concluding Remarks and Probing Further

Sofia J. Hadjileontiadou (♀) received the Diploma degree in Civil Engineering in 1986 and the Ph.D. degree in Educational Technology in 2000, both from the Aristotle University of Thessaloniki (AUTH), Thessaloniki, Greece. She also holds a MSc in Environmental Engineering. Currently, she is principal of SEK an educational structure within VET, tutor at the Master’s in Education (M.Ed) program of the Hellenic Open University and research associate at the 1-Year Programme of Pedagogical Training (EPPAIK) at the School of Pedagogical and Technological Education of Greece. She received the best full paper award at the ICALT’2004 conference of IEEE. Her research interests include educational technology, ICT mediated collaboration, blended learning, innovation in didactics, environmental education and fuzzy logic applications upon educational data. She has published 20 papers in peer reviewed international journals, 40 papers in peer reviewed international conference proceedings and 7 book chapters. She is a member of the Technical Chamber of Greece, the Greek Society of the Teachers of Environmental Education and the Greek Scientific Society of ICT in Education.

Sofia B. Dias (♀) currently works as a Research Assistant at the Faculty of Human Kinetics, University of Lisbon, Portugal. She embraced a Ph.D. in Science Education, specialty of Analysis and Organization of Educational Systems, financed by a project grant awarded by the Foundation for Science and Technology (FCT-Portugal). In 2007 she received an award of the Best Students University of Lisbon (UTL/Santander). She has published 2 books, 1 book chapter, 5 papers in peer reviewed international journals and 7 papers in peer reviewed international conference proceedings. Since 2011 she is peer reviewer of several international journals, namely: Computers & Education, The Internet & Higher Education, Interactive Learning Environments, Educational Research & Reviews, Academic Proceedings in Engineering Sciences, Systems, and Journal of Medical Internet Research. Just recently, she has won a 5-year FCT Postdoctoral grant for exploring blended, collaborative and affective learning in Higher Education. Her research interests and current projects focus on blended learning, ICT in education, learning management systems and intelligent modelling of learning processes.

José Diniz (♂) is a full professor at the University of Lisbon, Head of the Faculty of Human Kinetics, Director of the PhD. Program in Education and the European Master in Media Engineering for Education. He has published and presented both nationally and internationally in the specific areas of: Information and Communication Technologies (ICTs) integration in school context, Technology and Teacher Education, Youths’ lifestyles and technology. He was adviser of 18 doctoral dissertations and 29 master thesis, published 65 papers in peer reviewed international journals, 5 books, and 25 book chapters.

Leontios J. Hadjileontiadis (♂, b.1966) received the Diploma and the Ph.D. degree in Electrical and Computer Engineering in 1989 and 1997, respectively, both from the Aristotle University of Thessaloniki (AUTH), Thessaloniki, Greece. Professor Hadjileontiadis also holds a Diploma in Musicology (AUTH, Thessaloniki, 2011) and a Ph.D. degree in music composition (University of York, UK, 2004). Since December 1999 he joined the Department of Electrical and Computer Engineering, AUTH, Greece as a faculty member, where he is a Full Professor, working at the Signal Processing and Biomedical Technology Unit of the Telecommunications Laboratory. Professor Hadjileontiadis is an IEEE Senior Member.