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NEURO-FUZZY METHODS AND SYSTEMS FOR EVALUATION AND DESIGN IN ERGONOMICS AND HUMAN-COMPUTER INTERACTION

Alexander Nikov

The book examines neuro-fuzzy-based knowledge acquisition, modeling and study of complex human-machine systems in ergonomics and human-computer interaction. For solving of problems in both areas two neuro-fuzzy models are created: a fuzzy-knowledge-based evaluation mechanism and a fuzzy backpropagation algorithm.

Four applications of these models in the area of **ergonomics** are developed: 1) framework for human factors analysis of office automation systems; 2) tool for quick ergonomic screening of workplaces; 3) adaptable tool for ergonomic evaluation and design of workplaces; and 4) intelligent toolkit for creation and support of workshop production structures.

Four applications in **human-computer interaction** are developed: 1) method for user interface adaptation SOFIA; 2) a control structure for interactive systems adaptation CBAUM; 3) usage and user modeling for user-adaptivity systems MBAUM; and 4) intelligent system for usability evaluation of hypermedia user interfaces ISSUE.

The framework for human factor analysis of office automation systems was used in a study of more than 4000 workplaces in Italian Telecom. SOFIA was implemented for user interface adaptation of the information system of the Bulgarian parliament. Using CBAUM and MBAUM case studies for user interface adaptation in the electronic research funding system ELFI developed by the German National Centre for Information Technology were carried out. ISSUE was applied for usability evaluation of hypermedia educational software.

Alexander Nikov, senior lecturer of Computer Science and Human-Computer Interaction at the University of the West Indies, Trinidad and Tobago, is a highly regarded researcher on application of the computational intelligence models in the areas of human factors and human-computer interaction. A leading international lecturer, author, editor and consultant, he chairs Ergonomics and Human-Computer Interaction sessions on international conferences, has eight books and more than 120 published papers to his credit.