

Foreword

by *Gerhard-Wilhelm Weber and Pandian Vasant*

The purpose of this book *Artificial Intelligence Applications in Distance Education* is to deeply inquire, reflect, and comprehensively expose this current and emerging cutting edge technology in important fields of investigation and high-performance facilities for original, innovative, and novel real-world applications in the modern world and its area of Education. During the previous decades, the analytical tools and the methodological toolbox of computer science and applied mathematics, of informatics and statistics, in emerging analytics, algorithms and Information Technologies has gained the attention of numerous researchers and practitioners from all over the world, providing a strong impact also in natural sciences, engineering, economy finance, and information technologies.

The contributing authors of this book are experienced scientists from all over the globe; they utilize and further refine the deep model-based methods of mathematics and the less model-based so-called smart or intelligent algorithms with their roots in the engineering disciplines, in computer science, and informatics. The second ones are often named as heuristics and model-free; they are less rigorous mathematically, but released from the firmness of calculus, in order to integrate nature- and, especially, bio-inspired approaches to efficiently cope with hard problems. The rise of these algorithms from Artificial Intelligence which is, as we understood, rather natural and intuitive often happened in parallel to the powerful progress in mathematics that is model-based mainly. Nowadays, labeled by names like Statistical Learning and Machine Learning, Metaheuristics and Matheuristics, and by Operational Research, model-free and model-based streamlines of traditions and approaches meet and exchange in various centres of research, at important congresses, and in remarkable projects and agendas all around the world to overcome misunderstandings and wrong perceptions of different kinds between those two academic avenues, but to benefit from synergy effects, to jointly advance scientific progress and to provide a service to the solution of urgent real-life challenges. Such huge problems exist in every area of the modern world and academics, in engineering, the economy, social sciences, life and human sciences, and development and the improvement of living conditions and future perspectives.

Among the variety of these subjects and, in fact, including all of them, the distinguished editors selected the area of Education which may be regarded as a foundation for them all. At the same time, Education has the potential to be supported by all the other areas and subjects, especially, from the modern high-tech ones, from advances in social sciences, and social media and networks and, of course, as explained above, Artificial Intelligence. In this book, a special emphasis lies on Distance Education.

It is a remarkable achievement for this new book and its editors that they have strongly contributed to this important process in science and culture, for having opened the floor to scientists and practitioners in order to expose their recent experiences and insights, their core results and main techniques.

To all the authors of these valuable chapters, we extend our cordial appreciation and gratitude for having shared their devotion, excellence, and vision with the entire academic community and mankind. We are very thankful to the publishing house *IGI Global*, and to the editorial team, *Dr. Utku Köse*, and his colleagues, for having provided the chance and the floor for these experts to publish their outstanding achievements and contributions. We express our sincere thankfulness to them for having ensured a premium book of a high standard academic, applied, and social importance!

We wish all of you lots of joy in reading this exciting work, and we hope a great benefit is gained from it of personal and societal kind.

Sincerely yours,

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Gerhard-Wilhelm Weber is a Professor at IAM, METU, Ankara, Turkey. His research is on optimization and control (continuous and discrete), OR, financial mathematics, on life, bio and human sciences, dynamical systems, data mining, statistical learning, inverse problems, environment and development. He is involved in the organization of scientific life internationally. He received both his Diploma and Doctorate in mathematics and economics / business administration at Aachen University of Technology (RWTH Aachen), and his Habilitation (second doctorate) at Darmstadt University of Technology (TU Darmstadt). He held Professorships by proxy at the University of Cologne, Germany, and Chemnitz University of Technology, Germany, before he worked at Cologne Bioinformatics Center and then, in 2003, went to Ankara. At IAM, METU, he is in the Programs of Financial Mathematics, Actuarial Sciences, and Scientific Computing. He is the Assistant to the Director of IAM and a member of four further graduate schools, departments, and institutes of METU.

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