Foreword

Optimization has become a key technology in all areas of academic life and its practical use in real life. In fact, contributions of modern Optimization range from science, engineering, economics, the sectors of finance, energy, environment and ecology to social sciences and emerging \textit{“new frontiers,” “hard” and “soft” ones combined}, with all their challenges. Optimization has served and will further serve (\textit{i}) to represent reality in terms of mathematics and in a way which gives access to modern algorithmical methods and the power of high-performance computers, and (\textit{ii}) to give decision aid to persons and institutions in responsibility for the world of tomorrow. In this respect, Optimization has been and will further be witnessing the wealth of life, and survey and select chances for improvements in the technical and economical fields of life, and for improvements of living conditions on earth, in all quantitative and qualitative aspects and respects.

In these years, in addition to the Calculus based traditions of Optimization which originate from mathematics, physics and mechanics and which are more model-based, Engineering has contributed a lot to Optimization, too, namely, via Heuristics and Meta-Heuristics. These approaches are often inspired by nature, especially, by Biology, e.g., by Genetics and Population Dynamics. Herewith, they are often model-free, and they aim at learning from nature. By this view and ability to learn and, eventually, to benefit from the “success stories” of nature, Heuristics and Meta Heuristics have become surprisingly successful. It is subject of present and future research to further rigorously compare the model-free and model-based approaches and to combine, or hybridize, these two traditions fruitfully.

The present book now is a scientific “festival” of Meta-Heuristics in Optimization, especially, from the applied perspectives of engineering, business, economics and finance. Herewith, it represents state-of-the-art and modern developments as well; by this, the new book establishes a basis for further exchange, the establishment of theoretical foundations and results, by Optimizers of different academic backgrounds, and for joint efforts towards premium science and important applications - for the sake of mankind. Cordial thanks for the editors and publishers of this book who supported and encouraged that future potential and opportunity.

\textit{Gerhard-Wilhelm Weber}

\textit{Institute of Applied Mathematics, METU, Turkey}

\textit{Gerhard-Wilhelm Weber} is a Professor at IAM, METU, Ankara, Turkey. His research is in 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 into the organization of scientific life internationally. G.-W. Weber 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 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 Assistant to the Director of IAM and a member of three further graduate schools and institutes of METU. Further, he has affiliations at University of Siegen (Germany), University of Ballarat (Australia), University of Aveiro (Portugal), Malaysia University of Technology and University of North Sumatra (Indonesia). He has served in several national and international projects. Gerhard-Wilhelm Weber is (co-) author of more than 200 publications, e.g., papers and books, he has been member in the Editorial Boards of approximately 15 journals. G.-W. Weber has received a number of awards, calls and distinctions.