

# Preface

The idea of this monograph is to present the latest results related to biomechanical systems and materials. Biomechanical systems within this book are prostheses (lower limb and orbitarian cranial cavity), implants (such as for the femoral bone, microimplants for dental surgery, and total hip replacement), medical operation robots (for tumor removal), and muscular retraining systems (for forearm and wrist). To characterize and design such systems, a multidisciplinary approach is required which involves the classical disciplines of mechanical/materials engineering (design, analysis, and properties), and biology/medicine. The challenge in such an approach is that views, concepts or even languages are sometimes different from discipline to discipline and the interaction and communication of the scientists must be first developed and adjusted. In the context of materials, the interaction of materials with mechanical systems, their description as a mechanical system or their mechanical properties is covered.

The 6th International Conference on Advanced Computational Engineering and Experimenting, ACE-X 2012, was held in Istanbul, Turkey, from 1 to 4 July 2012 with a strong focus on computational-based and supported engineering. This conference served as an excellent platform for the engineering community to meet with each other and to exchange the latest ideas. This volume contains 11 revised and extended research articles written by experienced researchers participating in the conference. The book will offer the state-of-the-art of tremendous advances in biomechanical systems and materials.

The organizers and editors wish to thank all the authors for their participation and cooperation which made this volume possible. Finally, we would like to thank the team of Springer-Verlag, especially Dr. Christoph Baumann, for the excellent cooperation during the preparation of this volume.

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