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Biomechanical Biofeedback Systems and Applications

Springer

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Preface

A few years ago we started developing an application that would help Golfers Master a *perfect* golf swing by using an augmented biofeedback. We enthusiastically began our research, but soon found out that the literature in the area of biofeedback systems and applications is scattered across different research areas and domains. It was difficult to find books or articles relevant to the topics of our interest. A good deal of works was dealing only with a very narrow research topic or they were written as reviews and surveys. We did not find any works that would systematically and concisely discuss the research area of augmented biofeedback systems and applications; the area of our interest.

With the continuing research in this scientific area, we became aware that many of our research colleagues came across the same difficulties. An idea to write a book that systematically covers biomechanical branch of biofeedback systems was born. We made every effort to organize the content of this book systematically, clearly, concisely and in a way that reflects the most relevant topics in biomechanical biofeedback systems and applications from the view of engineers with expertise in signal processing, communication, and information technologies. The emphasis is on systems with augmented feedback and special attention is given to systems and applications that use technical equipment to provide concurrent feedback to the user.

The book starts with a relatively comprehensive introduction that tries to present the broad interdisciplinarity of this research area. Then its focus narrows to the explanation of biomechanical biofeedback, its systems, and its different implementation architectures. The second half of the book is dedicated to the applications of biofeedback systems in sport and rehabilitation. In connection to that we discuss some of the most notable problems regarding the performance limitations of the available technologies that are used in such systems. The last chapter is devoted to the detailed presentation of biomechanical biofeedback systems and applications developed and implemented by the authors of this book.

This book is intended for researchers who are interested in a systematic presentation and discussion of the most relevant and interesting topics of biomechanical biofeedback systems and applications. We sincerely hope that we succeeded in

connecting the scattered pieces of knowledge about biofeedback systems and applications in a concise, well-organized, understandable, and readable text that fills the void in this research area.

Ljubljana, Slovenia
July 2018

Anton Kos
Anton Umek

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