Foreword

The application of vision to robotics has seen an enormous progress in the last decade with the introduction on new algorithms and very powerful computer hardware. This progress has also been extended to a number of very dissimilar areas such as automation, medicine, and surveillance to name a few. Computer vision has seen very successful application in field and service robots, in particular in autonomous machines and automotive applications. This has been possible not only by the improvement of computer hardware but from the development of new very efficient algorithms.

Until a few years ago, fundamental problems affected computer vision that makes most algorithms not viable for real time application. This has started to change dramatically. Over the last few years, we have seen an enormous growth of very successful practical implementation of computer vision for robotics. Furthermore, some of them have exploited mass production of proprietary hardware to make the deployment of impressive applications at very reduced costs. This has also been possible due to a number of significant breakthroughs in the underlying algorithms and techniques, including feature detectors, classifiers and a large variety of very efficient machine learning algorithms.

This book presents a comprehensive introduction and the latest development to the fields of computer vision and applications to robotics, social robotics, visual control, and visual attention. The material is organized in various sections with a number of contributions from world experts in the different areas.

The target audience of this book includes robotics scientist, engineers, and students interested in getting a comprehensive background in the rapidly developing field of robotics and computer vision.

It is impossible to select a number of papers to cover all the recent progress in computer vision. Nevertheless, the editors have chosen a number of fundamental aspects of robotic vision that are addressed in a very comprehensive manner in this book. The material presented is intended to be a fundamental first step towards understanding the main challenges involved in robotic vision application.

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