Foreword

Although computer vision is such a relatively young field of study, it has matured immensely over the last 25 years or so—from well-constrained, targeted applications to systems that learn automatically from examples.

Such progress over these 25 years has been spurred not least by mind-boggling advances in vision and computational hardware, making possible simple tasks that could take minutes on small images, now integrated as part of real-time systems that do far more in a fraction of a second on much larger images in a video stream.

This all means that the focus of research has been in a perpetual state of change, marked by near-exponential advances and achievements, and witnessed by the quality, and often quantity, of outstanding contributions to the field published in key conferences and journals such as ICCV and PAMI. These advances are most clearly reflected by the growing importance of the application areas in which the novel and real-time developments in computer vision have been applied to or developed for. Twenty-five years ago, industrial quality inspection and simple military applications ruled the waves, but the emphasis has since spread its wings, some slowly and some like wildfire, to many more areas, for example, from medical imaging and analysis to surveillance and, inevitably, complex military and space applications.

So how does Roy's book reflect this shift? Naturally, there are many fundamental techniques that remain the same, and this book is a wonderful treasure chest of tools that provides the fundamentals for any researcher and teacher. More modern and state-of-the-art methodologies are also covered in the book, most of them pertinent to the topical application areas currently driving not only the research agenda, but also the market forces. In short, the book is a direct reflection of the progress and key methodologies developed in computer vision over the last 25 years and more.

Indeed, while the third edition of this book was already an excellent, successful, and internationally popular work, this fourth edition is greatly enhanced and updated. All its chapters have been substantially revised and brought up to date by the inclusion of many new references covering advances in the subject made even in the past year. There are now also two entirely new chapters (to reflect the great strides that have been made in the area of video analytics) on surveillance and in-vehicle vision systems. The latter is highly relevant to the coming era of advanced driver assistance systems, and the former's importance and role requires no emphasis in this day and age where so many resources are dedicated to criminal and terrorist activity monitoring and prevention.

The material in the book is written in a way that is both approachable and didactic. It is littered with examples and algorithms. I am sure that this volume will be welcomed by a great many students and workers in computer and machine vision, including practitioners in academia and industry—from beginners who are

starting out in the subject to advanced researchers and workers who need to gain insight into video analytics. I will also welcome it personally, for use by my own undergraduate and postgraduate students, and will value its presence on my bookshelf as an up-to-date reference on this important subject.

Finally, I am very happy to go on record as saying that Roy is the right person to have produced this substantial work. His long experience in the field of computer and machine vision surpasses even the "big bang" in computer vision around 25 years ago in the mid-80s when the Alvey Vision Conference (UK) and CVPR (USA) were only inchoates of what they have become today and reaches back to when ICPR and IAPR began to be dominated by image processing in the late 70s.

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