PREFACE

This book has grown out of the author's research experience and teaching practices for full-time undergraduate and graduate students at various universities, as well as for students and engineers taking summer courses. It is prepared with students and instructors in mind with the principal objective of introducing basic concepts, theories, methodologies, and techniques of image engineering in a vivid and pragmatic manner. This book will help beginners lay a thorough foundation and provide mature students and engineers with advanced materials.

Image engineering is a broad subject encompassing computer science, electrical and electronic engineering, as well as mathematics, physics, physiology, and psychology. Readers of this book should have some preliminary background in one of these areas. Knowledge of linear system theory, vector algebra, probability, and random process is beneficial but not necessary.

This book consists of four parts dealing respectively with image fundamentals, image processing, image analysis, and image understanding. It has 463 figures, 47 tables, and 1,196 numbered equations in addition to 113 examples and 277 problems. Moreover, over 300 key references are given at the end of book.

This book can be used for courses in image engineering, computer science, electrical and electronic engineering, image pattern recognition, information processing, and intelligent information systems. It can also be of great help to scientists and engineers doing research and development related to image engineering.

There are many ways to use it as a textbook:

Firstly, senior students of computer science and electronic engineering may find several chapters, such as Chapters 1 to 6, 8 to 10, and 14 to 16 useful for a course titled Image Engineering.

Secondly, chapters from Parts 1 and 2 can be used for an undergraduate course called Fundamentals of Image Processing while chapters from Parts 3 and 4 are appropriate for a graduate course called Image Analysis and Understanding.

Thirdly, lecturers of Image Processing may choose chapters from Parts 1 and 2, professors of Image Analysis can turn to chapters from Parts 1 and 3, and those teaching Image Understanding will find chapters from Parts 1 and 4 helpful.

While readers may find this book reasonably comprehensive, some important topics have actually been omitted due to the limited book size. I hope I will have an opportunity in the future to expand and update its content in accordance with the kind feedback of readers.

Special thanks go to Cengage Learning Asia (CLA) and Tsinghua University Press (TUP), in particular, Liping Yang from CLA as well as Kai-Yan Zhou and Guo-Xin Chen from TUP. Their kind and professional assistance are truly appreciated.

Last but not least, I am deeply indebted to my wife, my daughter, and my parents for their encouragement, patience, support, tolerance, and understanding during the writing of this book.

Yu-Jin ZHANG
Department of Electronic Engineering
Tsinghua University, Beijing 100084
The People's Republic of China

Office: Rohm Building, 6-305
Tel: 86-10-62798540
Fax: 86-10-62770317
E-mail: zhang-yj@tsinghua.edu.cn
Homepage: http://oa.ee.tsinghua.edu.cn/~zhangyujin/