

Preface

It has been 10 years since the publication of the second edition. The programming language, Java, has now developed into its maturity, being the language of choice in many industrial and business domains. Yet the skills of developing computer graphics applications using Java are surprisingly lacked in the computer science curricula. Though no longer active in classroom teaching, the first author has developed and published several Android applications using Java, the main language for Android developers. The second author has taught Computer Graphics at his current university for the past 17 years using the first and second editions of this textbook, apart from his previous years in Australia using different textbooks. We feel strongly a need for updating the book.

This third edition continues the main theme of the first two editions, that is, graphics programming in Java, with all the source code, except those for exercises, available to the reader. Major updates in this new edition include the following:

1. The contents of all chapters are updated according to the authors' years of classroom experiences and recent feedback from our students.
2. Hidden-line elimination and hidden-face elimination are merged into a single chapter.
3. A new chapter on color, texture, and lighting is added, as Chap. 7.
4. The companion software package, CGDemo, that demonstrates the working of different algorithms and concepts introduced in the book, is enhanced with two new algorithms added and a few bugs fixed.
5. A set of 37 video sessions (7–11 min each) in MOOC (Massive Open Online Course) style, covering all the topics of the textbook, is supplemented.
6. A major exercise, split into four parts, on implementing the game of Tetris is added at the end of four relevant chapters.

Many application examples illustrated in this book could be readily implemented using Java 3D or OpenGL without any understanding of the internal working of the implementation, which we consider undesirable for computer science students. We therefore believe that this textbook continues to serve as an indispensable introduction to the foundation of computer graphics, and more

importantly, *how* various classic algorithms are designed. It is essential for computer science students to learn the skills on how to optimize time-critical algorithms and how to develop elegant algorithmic solutions.

The example programs can be downloaded from the Internet at:

<http://home.kpn.nl/ammeraal/>

or at:

<http://www.utdallas.edu/~kzhang/BookCG/>

Finally, we would like to thank the UT-Dallas colleague Pushpa Kumar, who has been using this textbook to teach undergraduate Computer Graphics class and provided valuable feedback. We are grateful to Susan Lagerstrom-Fife of Springer for her enthusiastic support and assistance in publishing this edition.

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