Preface

This is the second volume of a book series that provides a modern, algorithmic introduction to digital image processing. It is designed to be used both by learners desiring a firm foundation on which to build and practitioners in search of critical analysis and modern implementations of the most important techniques. This updated and enhanced paperback edition of our comprehensive textbook *Digital Image Processing: An Algorithmic Approach Using Java* packages the original material into a series of compact volumes, thereby supporting a flexible sequence of courses in digital image processing. Tailoring the contents to the scope of individual semester courses is also an attempt to provide affordable (and "backpack-compatible") textbooks without comprimising the quality and depth of content.

This second volume, titled *Core Algorithms*, extends the introductory material presented in the first volume (*Fundamental Techniques*) with additional techniques that are, nevertheless, part of the standard image processing toolbox. A forthcoming third volume (*Advanced Techniques*) will extend this series and add important material beyond the elementary level, suitable for an advanced undergraduate or even graduate course.

Math, Algorithms, and "Real" Code

It has been our experience in teaching in this field that mastering the core takes more than just reading about the techniques—it requires active construction and experimentation with the *algorithms* to acquire a feeling for how to use these methods in the real world. Internet search engines have made finding *someone's* code for almost any imaging problem as simple as coming up with a succinct enough set of keywords. However, the problem is not to find *a* solution, but developing one's own and understanding how it works—or why it

eventually does not. Whereas we feel that the real value of this series is not in its code, but rather in the critical selection of algorithms, illustrated explanations, and concise mathematical derivations, we continue to augment our algorithms with complete implementations, as even the best description of a method often omits some essential element necessary for the actual implementation, which only the unambiguous semantics of a real programming language can provide.

Online Resources

The authors maintain a Website for this text that provides supplementary materials, including the complete Java source code for the examples, the test images used in the examples, and corrections. Visit this site at

www.imagingbook.com

Additional materials are available for educators, including a complete set of figures, tables, and mathematical elements shown in the text, in a format suitable for easy inclusion in presentations and course notes. Comments, questions, and corrections are welcome and should be addressed to

imagingbook@gmail.com

Acknowledgements

As with its predecessors, this book would not have been possible without the understanding and steady support of our families. Thanks go to Wayne Rasband (NIH) for developing and refining ImageJ and for his truly outstanding support of the community. We appreciate the contribution from many careful readers who have contacted us to suggest new topics, recommend alternative solutions, or to suggest corrections. Finally, we are grateful to Wayne Wheeler for initiating this book series and Catherine Brett and her colleagues at Springer's UK and New York offices for their professional support.

Hagenberg, Austria / Washington DC, USA
June 2008

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http://www.springer.com/978-1-84800-194-7

Principles of Digital Image Processing
Core Algorithms
Burger, W.; Burge, M.J.
2009, XII, 332 p. With online files/update., Softcover
ISBN: 978-1-84800-194-7