
Preface

The field of image processing has seen many developments in many fronts since its inception. However, there is a dearth of knowledge when it comes to one area namely the area of using alternate sampling grids. Almost every textbook on Digital Image Processing mentions the possibility of using hexagonal sampling grids as an alternative to the conventional square grid. The mention, however, is usually cursory, leading one to wonder if considering an alternative sampling grid is just a worthless exercise. Nevertheless, the cursory mention also often includes a positive point about a hexagonal grid being advantageous for certain types of functions. While it was curiosity that got us interested in using hexagonal grids, it was the positive point that spurred us to study the possibility of using such a grid further and deeper. In this process we discovered that while many researchers have considered the use of hexagonal grids for image processing, most material on this topic is available only in the form of research papers in journals or conference proceedings. In fact it is not possible to find even a comprehensive survey on this topic in any journal. Hence the motivation for this monograph.

In writing this book, we were mindful of the above point as well as the fact that there are no hardware resources that currently produce or display hexagonal images. Hence, we have tried to cover not only theoretical aspects of using this alternative grid but also the practical aspects of how one could actually perform hexagonal image processing. For the latter, we have drawn from our own experience as well that of other researchers who have tried to solve the problem of inadequate hardware resources.

A large part of the work that is reported in the book was carried out when the authors were at the Department of Electrical and Electronic Engineering, The University of Auckland, New Zealand. The book took its current shape and form when the authors had moved on to the University of Southampton (LM) and IIT-Hyderabad (JS). Special thanks to Prof. Narendra Ahuja for readily agreeing to write the foreword. Thanks are due to the anonymous reviewers whose feedback helped towards making some key improvements to the book.

Lee: Thanks are first due to Prof. Mark Nixon and Dr John Carter who were understanding and provided me time to work on the book. Secondly thanks go to my, then, supervisor Jayanthi for believing in the idea I came to her office with. Thirdly, I would like to thank the *crew* at Auckland University for making my time there interesting: adrian, anthony, bev, bill, brian, brad, bruce, colin, david, dominic, evans, evan, geoff ($\times 2$), jamie, joseph, nigel, russell m, and woei. Finally, thanks go to Sylvia for being herself the whole time I was writing the manuscript.

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Middleton, L.; Sivaswamy, J.

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