

Preface

People write books for different reasons. One is an opportunity to express the thoughts that would be valuable for contemporaries and the future generations. My quest for writing this has been to summarize my sustained research in this area for the past 10 years. A decade ago when I joined the School of Electrical, Computer and Telecommunications Engineering at the University of Wollongong as an academic, one of my goals was to develop a practical systems that would bring computer vision closer to one's day to day activities. I was inspired by my own research at the University of Adelaide as a Research Fellow working for CSSIP developing a system to automatically classify ships for Australian Naval Forces. Despite lacking support to garner any patents, I published the first developmental work in 2005. Then a refined version of this work which was published in IET Computer Vision received national and international media accolades. Soon after, the big players in the consumer electronics giants such as Samsung patented the technology for mobile phones and televisions. Few years later, this probably prompted Microsoft to develop Kinect camera which use hand gesture recognition for gaming. Today, hand gesture control is considered as viable option for gaming and non-critical input to computers and smart devices. Samsung smart television can be controlled using hand gestures. The consumer electronics control system that I developed made use of my best abilities in classification and system development. When I first developed a Static Hand Gesture Recognition system which garnered worldwide publicity, it was the first attempt by a researcher in the world to use Hu moments approach for hand gesture recognition. Over the years, I have incrementally developed the theory and technology to implement such a system in a Smartphone or many other devices with minimal power for hand gesture recognition.

There has been depth of research into Sign Language since 1990s. This research is also benefitted with any developments in Hand Gesture Recognition. I believe that, miniscule devices optimized for receiving and being able to recognize human gestures will play a vital role in future of computer human interactions. The challenge now is to develop the theory further with supplementing information not just vision in order to accurately detect and recognize hand gestures.

Every effort has been made to reflect most of the successful algorithms and approaches in hand gesture recognition in this book so that it would be versatile for

any graduate student who is embarking on research into man-machine interaction. The readers are encouraged to use Matlab for developing fast routines to implement any type of hand gesture related processing. If Matlab would result in unexpectedly longer processing time, they are directed to use OpenCV (Open Computer Vision) platform that is fast becoming very popular with academics and developers which already has numerous computer vision related functional libraries. The youtube also presents a vast collection of evidence to the usefulness of OpenCV with thousands of routines already written in C++ to process images.

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