

Foreword

Surveillance is an integral part of human existence - we are naturally endowed with the aptitude to observe, process, and extract information from the surrounding in order to respond to the environment in an appropriate manner. Teaching machines to do the same things is, however, now recognized to be a challenging task that engages several different scientific fields including machine vision, pattern recognition, sensor networks, distributed computing, information fusion and signal processing. Rapid advances in sensor design, processor technology, digital archiving, and algorithm development have now made it possible for us to design and install automatic surveillance systems for increased security requirements at critical locations such as airports and street corners. This means questions like “Is this environment hazardous to humans?”, “What is the identity of the individual at the airline counter?”, “Is this subway station too crowded?”, “Has there been a traffic violation or accident?” and “Are the people on the street corner behaving suspiciously?” may be easily posed to machines equipped with video, audio or thermal sensors for perceiving their environment. Indeed, the field of automated surveillance has experienced tremendous growth over the last decade due to increased attention on national security and the deployment of surveillance cameras in public spaces. In most situations, the images captured by these cameras are currently monitored by human operators. The goal is to replace the human operators so that objective, consistent and real-time decisions can be made about events and people.

Multimodal surveillance combines multiple sources of information presented by different sensors in order to generate a more accurate and robust interpretation of the environment. Consolidating information from diverse sources in an effective manner is a challenging task and has broad applications in several different fields besides surveillance. This book introduces the reader to (a) novel sensing mechanisms employed by machines to discern their environment, (b) state of the art algorithms to process and fuse the sensed information in order to interpret the environment; and (c) applications where multimodal surveillance have tremendous impact. Given the importance of this topic, this book will be extremely beneficial to readers who are interested in carrying out research in automated surveillance or keen on understanding the progress made in this important field. The editors of this book are distinguished researchers who have made significant contributions in surveillance. They are to be commended for putting together this edited volume that contains chapters written by leading experts on a number of important topics in surveillance.

Anil K. Jain
Michigan State University
January 15, 2007