
Bayesian Image Super Resolution

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**Intelligent Communication
and Computational**

Technologies MDPI

This book covers the results of a study concerning systems for healthcare-oriented monitoring of elderly persons. It is focused on the methods for processing data from impulse-radar sensors and depth sensors, aimed at

localisation of monitored persons and estimation of selected quantities informative from the healthcare point of view. It includes mathematical descriptions of the considered methods, as well as the corresponding algorithms and the results of their testing in a real-world context. Moreover, it explains the motivations for developing healthcare-oriented monitoring systems and specifies the real-world needs which may be addressed by such systems. The healthcare systems, all over the world, are confronted with challenges implied by the ageing of population and the lack of adequate recruitment of healthcare professionals. Those challenges can be met by developing new technologies aimed at improving the quality of life of elderly people and at increasing the efficiency of public health management. Monitoring systems may contribute to this strategy by providing information on the evolving health status of independently-living elderly persons, enabling healthcare personnel to quickly react to dangerous events. Although these facts are generally acknowledged, such systems are not yet being commonly used in healthcare facilities and households. This may be explained by the difficulties related to the development of technological solutions which can be both acceptable for monitored persons and capable of providing healthcare personnel with useful information. The impulse-radar sensors and depth sensors, considered in this

book, have a potential for overcoming those difficulties since they are not cumbersome for the monitored persons -- if compared to wearable sensors -- and do not violate the monitored person's privacy -- if compared to video cameras. Since for safety reasons the level of power, emitted by the radar sensors, must be ultra-low, the task of detection and processing of signals is a research challenge which requires more sophisticated methods than those developed for other radar applications. This book contains descriptions of new Bayesian methods, applicable for the localisation of persons by means of impulse-radar sensors, and an exhaustive review of previously published ones. Furthermore, the methods for denoising, regularised numerical differentiation and fusion of data from impulse-radar sensors and depth sensors are systematically reviewed in this book. On top of that, the results of experiments aimed at comparing the performance of various data-processing methods, which may serve as guidelines for related future projects, are presented.

Advances in Multimedia
Information Processing - PCM
2006 Springer

The goal of super-resolution is to increase not only the size of an image, but also its apparent resolution, making the result more plausible to human viewers. Many super-resolution methods do well at modest magnification factors, but even the best suffer from boundary and gradient artifacts at high magnification factors. This thesis presents Bayesian edge inference (BEI), a novel method grounded

in Bayesian inference that does not suffer from these artifacts and remains competitive in published objective quality measures. BEI works by modeling the image capture process explicitly, including any downsampling, and modeling a fictional recapture process, which together allow principled control over blur. Scene modeling requires noncausal modeling within a causal framework, and an intuitive technique for that is given. Finally, BEI with trivial changes is shown to perform well on two tasks outside of its original domain--CCD demosaicing and inpainting--suggesting that the model generalizes well.

Artificial Neural

Networks - ICANN

2010 KIT Scientific Publishing

The rapid increase in computing power and communication speed, coupled with computer storage facilities availability, has led to a new age of

multimedia applications. This book presents recent advances in Multimedia Signal Processing and Communications.

Computer Analysis of Images and Patterns
ScholarlyEditions

The two volume set LNCS 6938 and LNCS 6939 constitutes the refereed proceedings of the 7th International Symposium on Visual Computing, ISVC 2011, held in Las Vegas, NV, USA, in September 2011. The 68 revised full papers and 46 poster papers presented together with 30 papers in the special tracks were carefully reviewed and selected from more than 240 submissions. The papers of part I (LNCS 6938) are organized in computational bioimaging, computer graphics, motion

and tracking, segmentation, visualization; mapping modeling and surface reconstruction, biomedical imaging, computer graphics, interactive visualization in novel and heterogeneous display environments, object detection and recognition. Part II (LNCS 6939) comprises topics such as immersive visualization, applications, object detection and recognition, virtual reality, and best practices in teaching visual computing.

Springer

The three-volume set LNCS 8149, 8150, and 8151 constitutes the refereed proceedings of the 16th International Conference on Medical Image Computing and Computer-Assisted

Intervention, MICCAI 2013, held in Nagoya, Japan, in September 2013. Based on rigorous peer reviews, the program committee carefully selected 262 revised papers from 789 submissions for presentation in three volumes. The 95 papers included in the first volume have been organized in the following topical sections: physiological modeling and computer-assisted intervention; imaging, reconstruction, and enhancement; registration; machine learning, statistical modeling, and atlases; computer-aided diagnosis and imaging biomarkers; intraoperative guidance and robotics;

microscope, optical imaging, and histology; cardiology, vasculatures and tubular structures; brain imaging and basic techniques; diffusion MRI; and brain segmentation and atlases.

Advanced Concepts for Intelligent Vision Systems Springer Nature
The four-volume set LNCS 11070, 11071, 11072, and 11073 constitutes the refereed proceedings of the 21st International Conference on Medical Image Computing and Computer-Assisted Intervention, MICCAI 2018, held in Granada, Spain, in September 2018. The 373 revised full papers presented were carefully reviewed and selected from 1068 submissions

in a double-blind review process. The papers have been organized in the following topical sections: Part I: Image Quality and Artefacts; Image Reconstruction Methods; Machine Learning in Medical Imaging; Statistical Analysis for Medical Imaging; Image Registration Methods. Part II: Optical and Histology Applications: Optical Imaging Applications; Histology Applications; Microscopy Applications; Optical Coherence Tomography and Other Optical Imaging Applications. Cardiac, Chest and Abdominal Applications: Cardiac Imaging Applications; Colorectal, Kidney and Liver Imaging Applications; Lung Imaging Applications; Breast Imaging

Applications; Other Abdominal Applications. Part III: Diffusion Tensor Imaging and Functional MRI: Diffusion Tensor Imaging; Diffusion Weighted Imaging; Functional MRI; Human Connectome. Neuroimaging and Brain Segmentation Methods: Neuroimaging; Brain Segmentation Methods. Part IV: Computer Assisted Intervention: Image Guided Interventions and Surgery; Surgical Planning, Simulation and Work Flow Analysis; Visualization and Augmented Reality. Image Segmentation Methods: General Image Segmentation Methods, Measures and Applications; Multi-Organ Segmentation; Abdominal Segmentation Methods; Cardiac Segmentation	Methods; Chest, Lung and Spine Segmentation; Other Segmentation Applications. Bayesian Super-resolution with Application to Radar Target Recognition Springer The two-volume set LNCS 9516 and 9517 constitutes the thoroughly refereed proceedings of the 22nd International Conference on Multimedia Modeling, MMM 2016, held in Miami, FL, USA, in January 2016. The 32 revised full papers and 52 poster papers were carefully reviewed and selected from 117 submissions. In addition 20 papers were accepted for five special sessions out of 38 submissions as well as 7 demonstrations (from 11 submissions) and 9 video showcase
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papers. The papers are organized in topical sections on video content analysis, social media analysis, object recognition and system, multimedia retrieval and ranking, multimedia representation, machine learning in multimedia, and interaction and mobile. The special sessions are: good practices in multimedia modeling; semantics discovery from multimedia big data; perception, aesthetics, and emotion in multimedia quality modeling; multimodal learning and computing for human activity understanding; and perspectives on multimedia analytics.

Recent Advances in
Multimedia Signal
Processing and
Communications

Springer

This volume collects the papers accepted for presentation at the 11th International Conference on Advanced Concepts for Intelligent Vision Systems (ACIVS 2009). Following the first meeting in Baden-Baden (Germany) in 1999, which was part of a large multiconference, the ACIVS conference then developed into an independent scientific event and has ever since maintained the tradition of being a single track conference. ACIVS 2009 attracted computer scientists from 25 different countries, mostly from Europe, but also from Australia, New-Zealand

and Japan, and from the Technovision projects. USA and Mexico. We would like to thank the invited speakers

Although ACIVS is a conference on all areas Steve Sangwine (University of Essex, UK) and Jordi Inglada (CNES, France) for enhancing the technical

of image and video processing, submission stand together with in certain major fields of interest. As was the case last year, program with their

about a quarter of these selected papers deal with image and video coding and presentations.

processing, including Artificial Neural Networks - ICANN 2007 Springer

filtering and restoration Super Resolution of Images and Video Morgan & Claypool Publishers

and low-level analysis. Medical Image Computing and Computer-Assisted Intervention -- MICCAI 2013 Morgan & Claypool Publishers

Topics related to This thesis is concerned with methods to facilitate automatic target

biometrics (including recognition using images generated from a group of associated radar

face recognition), systems. Target recognition algorithms require access to a

tracking, pattern database of previously

recognition and scene understanding all remain well represented. Noteworthy are the growing number of papers related to medical applications and color processing and the papers related to the

recorded or synthesized radar images for the targets of interest, or a database of features based on those images. However, the resolution of a new image acquired under non-ideal conditions may not be as good as that of the images used to generate the database. Therefore it is proposed to use super-resolution techniques to match the resolution of new images with the resolution of database images. A comprehensive review of the literature is given for super-resolution when used either on its own, or in conjunction with target recognition. A new superresolution algorithm is developed that is based on numerical Markov chain Monte Carlo Bayesian statistics. This algorithm allows uncertainty in the superresolved image to be taken into account in the target recognition process. It is shown that the Bayesian approach improves the probability of correct target classification over standard super-resolution techniques. The new super-resolution algorithm is demonstrated using a simple synthetically generated data set and is compared to other similar algorithms. A variety of effects that degrade super-resolution performance, such as defocus, are analyzed and techniques to compensate for these are presented. Performance of the super-resolution algorithm is then tested as part of a Bayesian target recognition framework using

measured radar data.
UAV Photogrammetry
and Remote Sensing
Springer

This book is the second of a two-volume set that constitutes the refereed proceedings of the 17th International Conference on Artificial Neural Networks, ICANN 2007. It features contributions related to computational neuroscience, neurocognitive studies, applications in biomedicine and bioinformatics, pattern recognition, self-organization, text mining and internet applications, signal and times series processing, vision and

image processing, robotics, control, and more.

Bayesian Estimation of High-Resolution Imagery from Low-Resolution Video Sequences and Multisensor Data Sets
John Wiley & Sons

The three-volume set LNCS 10433, 10434, and 10435 constitutes the refereed proceedings of the 20th International Conference on Medical Image Computing and Computer-Assisted Intervention, MICCAI 2017, held in Quebec City, Canada, in September 2017. The 255 revised full papers presented were carefully reviewed and selected from 800 submissions in a two-

phase review process.

The papers have been organized in the following topical sections: Part I: atlas and surface-based techniques; shape and patch-based techniques; registration techniques, functional imaging, connectivity, and brain parcellation; diffusion magnetic resonance imaging (dMRI) and tensor/fiber processing; and image segmentation and modelling. Part II: optical imaging; airway and vessel analysis; motion and cardiac analysis; tumor processing; planning and simulation for medical interventions; interventional imaging and navigation; and medical image

computing. Part III: feature extraction and classification techniques; and machine learning in medical image computing.

Advances in Neural Information Processing Systems 19 Springer Science & Business Media

With the exponential increase in computing power and broad proliferation of digital cameras, super-resolution imaging is poised to become the next "killer app." The growing interest in this technology has manifested itself in an explosion of literature on the subject. Super-Resolution Imaging consolidates key recent research

contributions from eminent scholars and practitioners in this area and serves as a starting point for exploration into the state of the art in the field. It describes the latest in both theoretical and practical aspects of direct relevance to academia and industry, providing a base of understanding for future progress. Features downloadable tools to supplement material found in the book Recent advances in camera sensor technology have led to an increasingly larger number of pixels being crammed into ever-smaller spaces. This has resulted in an overall decline in the visual quality of	recorded content, necessitating improvement of images through the use of post-processing. Providing a snapshot of the cutting edge in super-resolution imaging, this book focuses on methods and techniques to improve images and video beyond the capabilities of the sensors that acquired them. It covers: History and future directions of super-resolution imaging Locally adaptive processing methods versus globally optimal methods Modern techniques for motion estimation How to integrate robustness Bayesian statistical approaches Learning-based methods
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Applications in remote sensing and medicine
Practical implementations and commercial products based on super-resolution The book concludes by concentrating on multidisciplinary applications of super-resolution for a variety of fields. It covers a wide range of super-resolution imaging implementation techniques, including variational, feature-based, multi-channel, learning-based, locally adaptive, and nonparametric methods. This versatile book can be used as the basis for short courses for engineers and scientists, or as part of graduate-level courses

in image processing.
Advances in Neural Information Processing Systems 16 Springer
This volume contains 85 papers presented at CSI 2013: 48th Annual Convention of Computer Society of India with the theme “ ICT and Critical Infrastructure ” . The convention was held during 13th – 15th December 2013 at Hotel Novotel Varun Beach, Visakhapatnam and hosted by Computer Society of India, Vishakhapatnam Chapter in association with Vishakhapatnam Steel Plant, the flagship company of RINL, India. This volume contains papers mainly focused on Data Mining, Data Engineering and Image Processing, Software Engineering and Bio-Informatics, Network Security, Digital Forensics and Cyber Crime, Internet and Multimedia Applications and E-

Governance Applications.
Computer Analysis of
Images and Patterns
Springer

The field of mechatronics (which is the synergistic combination of precision mechanical engineering, electronic control and systems thinking in the design of products and manufacturing processes) is gaining much attention in industries and academics. It was detected that the topics of computer vision, control and robotics are imperative for the successful of mechatronics systems. This book includes several chapters which report successful study cases about computer vision, control and robotics. The readers will have the latest information related to mechatronics, that contains the details of implementation, and the description of the test scenarios.

Medical Image
Computing and
Computer Assisted
Intervention – MICCAI
2018 CRC Press

This book constitutes the refereed conference proceedings of the 8th International Conference on Image and Graphics, ICIG 2015 held in Tianjin, China, in August 2015. The 164 revised full papers and 6 special issue papers were carefully reviewed and selected from 339 submissions. The papers focus on various advances of theory, techniques and algorithms in the fields of images and graphics.
Super-resolution Via
Image Recapture and
Bayesian Effect

Modeling CRC Press

This book focuses on the super resolution of images and video. The authors' use of the term super resolution (SR) is used to describe the process of obtaining a high resolution (HR) image, or a sequence of HR images, from a set of low resolution (LR) observations. This process has also been referred to in the literature as resolution enhancement (RE). SR has been applied primarily to spatial and temporal RE, but also to hyperspectral image enhancement. This book concentrates on motion based spatial RE, although the authors also describe motion free and hyperspectral image SR problems. Also examined is the very recent research area of SR for

compression, which consists of the intentional downsampling, during pre-processing, of a video sequence to be compressed and the application of SR techniques, during post-processing, on the compressed sequence. It is clear that there is a strong interplay between the tools and techniques developed for SR and a number of other inverse problems encountered in signal processing (e.g., image restoration, motion estimation). SR techniques are being applied to a variety of fields, such as obtaining improved still images from video sequences (video printing), high definition television, high performance color Liquid Crystal Display (LCD) screens, improvement of the quality of color

images taken by one CCD, video surveillance, remote sensing, and medical imaging. The authors believe that the SR/RE area has matured enough to develop a body of knowledge that can now start to provide useful and practical solutions to challenging real problems and that SR techniques can be an integral part of an image and video codec and can drive the development of new coder-decoders (codecs) and standards.

Image and Graphics

Springer Nature

The two-volume set LNCS 9279 and 9280 constitutes the refereed proceedings of the 18th International Conference on Image Analysis and Processing, ICIAP

2015, held in Genoa, Italy, in September 2015. The 129 papers presented were carefully reviewed and selected from 231 submissions. The papers are organized in the following seven topical sections: video analysis and understanding, multiview geometry and 3D computer vision, pattern recognition and machine learning, image analysis, detection and recognition, shape analysis and modeling, multimedia, and biomedical applications. Non-Invasive Monitoring of Elderly Persons Springer The book includes insights that reflect the advances in the field of Internet of Things from

upcoming researchers and leading academicians across the globe. It contains the high-quality peer-reviewed papers of ' International Conference on Internet of Things for Technological Development (IoT4TD 2017) ', held at Kadi Sarva Vishvavidyalaya, Gandhinagar, Gujarat, India during April 1-2, 2017. The book covers variety of topics such as Internet of things, Intelligent Image Processing, Networks and Mobile Communications, Big Data and Cloud. The book is helpful for the perspective readers ' from computer industry and academia to derive the advances of next

generation communication and computational technology and shape them into real life applications. Facial Texture Super-Resolution by Fitting 3D Face Models Springer The two volume set LNCS 6854/6855 constitutes the refereed proceedings of the International Conference on Computer Analysis of Images and Patterns, CAIP 2011, which took place in Seville, Spain, August 29-31, 2011. The 138 papers presented together with 2 invited talks were carefully reviewed and selected from 286 submissions. The papers are organized in topical section on: motion analysis, image and shape models, segmentation and grouping, shape recovery, kernel methods, medical imaging, structural pattern recognition, Biometrics, image and video

processing, calibration; and
tracking and stereo vision.