Super Resolution From A Single Image

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Single-Molecule Science **CRC Press**
Motion-Free Super-Resolution is a compilation of very recent work on various methods of generating super-resolution (SR) images from a set of low-resolution images. The current literature on this topic deals primarily with the use of motion cues for the purpose of generating SR images. These cues have, it is shown, their advantages and disadvantages. In contrast, this book shows that cues other than motion can also be used for the same purpose, and

addresses both the merits and demerits of these new techniques. Motion-Free Super-Resolution supersedes much of the lead author ' s previous edited volume, "Super-Resolution Imaging," and includes an up-to-date account of the latest research efforts in this fast-moving field. This sequel also features a style of presentation closer to that of a textbook, with an emphasis on teaching and explanation rather than scholarly presentation.

2018 IEEE Fourth International Conference on Multimedia Big Data (BigMM)

Springer Nature

This unique book on super-resolution microscopy techniques presents comparative, in-depth analyses of the strengths and weaknesses of the individual approaches. It was written for non-experts who need to understand the principles of super-resolution or who wish to use recently commercialized instruments as well as for professionals who plan to realize novel microscopic devices. Explaining the practical requirements in terms of hardware, software and sample preparation, the book offers a wealth of hands-on tips and practical tricks to get a setup running, provides invaluable help and support for successful data acquisition and specific advice in the context of

data analysis and visualization. Furthermore, it addresses a wide array of transdisciplinary fields of applications. The author begins by outlining the joint efforts that have led to achieving super-resolution microscopy combining advances in single-molecule photophysics, fluorophore design and fluorescent labeling, instrument design and software development. The following chapters depict and compare current main standard techniques such as structured illumination microscopy, single-molecule localization, stimulated emission depletion microscopy and multi-scale imaging including light-sheet and expansion microscopy. For each individual approach the experimental setups are introduced, the imaging protocols are provided and the various applications illustrated. The book concludes with a discussion of future challenges addressing issues of routine applications and further commercialization of the available methods. Guiding users in how to make choices for the design of

their own experiments from scratch to promising application, this one-stop resource is intended for researchers in the applied sciences, from chemistry to biology and medicine to physics and engineering.

Computer Vision - ACCV 2010

Springer Nature

If you're a beginner photographer, this book can save you hundreds of dollars. If you're a seasoned pro, it can save you thousands. With access to over 16 HOURS of online video, this book helps you choose the best equipment for your budget and style of photography. In this book, award-winning author and photographer Tony Northrup explains explains what all your camera, flash, lens, and tripod features do, as well as which are worth paying for and which you can simply skip. Tony provides information specific to your style of photography, whether you're a casual photographer or you're serious about portraits, landscapes, sports, wildlife, weddings, or even macro. For the casual reader, Tony provides quick recommendations to allow you to get the best gear for your budget, without spending days researching. If you love camera gear, you'll be able to dive into 200 pages of detailed information covering Nikon, Canon, Sony, Micro Four-Thirds, Olympus, Samsung, Leica, Mamiya, Hasselblad, Fuji,

Pentax, Tamron, Sigma, Yongnuo, PocketWizard, Phottix, Pixel King, and many other manufacturers. Camera technology changes fast, and this book keeps up. Tony updates this book several times per year, and buying the book gives you a lifetime subscription to the updated content. You'll always have an up-to-date reference on camera gear right at your fingertips. Here are just some of the topics covered in the book: What should my first camera be?Which lens should I buy?Should I buy Canon, Nikon, or Sony?Is a mirrorless camera or a DSLR better for me?Do I need a full frame camera?Is it safe to buy generic lenses and flashes?What's the best landscape photography gear?Which portrait lens and flash should I buy?What gear do I need to photograph a wedding?How can I get great wildlife shots on a budget?Which sports photography equipment should I purchase?Should I buy zooms or primes?Is image stabilization worth the extra cost?Which type of tripod should I buy?Which wireless flash system is the best for my budget?How can I save money by buying used?What kind of computer should I get for photo editing?What studio lighting equipment should I buy?When you buy this book, you'll be able to immediately read the book online. You'll also be able to download it in PDF, .mobi, and .epub

formats--every popular format for your computer, tablet, smartphone, or eReader!

Computer Vision -- ECCV 2014 Springer Science & Business Media This book is devoted to the issue of image s uper-resolution—obtaining high-resolution images from single or multiple low-resolution images. Although there are numerous algorithms available for image interpolation and super-resolution, there's been a need for a book that establishes a common thread between the two processes. Filling this need, Image Super-Resolution and Applications presents image interpolation as a building block in the super-resolution reconstruction process. Instead of approaching image interpolation as either a polynomial-based problem or an inverse problem, this book breaks the mold and compares and contrasts the two approaches. It presents two directions for image super-resolution: super-resolution with a priori information and blind super-resolution reconstruction of images. It also devotes chapters to the two complementary steps used to obtain high-resolution images: image registration and image fusion. Details techniques for color image interpolation and interpolation for pattern recognition Analyzes image

interpolation as an inverse problem Presents image registration methodologies Considers image fusion and its application in image super resolution Includes simulation experiments along with the required MATLAB® code Supplying complete coverage of image-super resolution and its applications, the book illustrates applications for image interpolation and super-resolution in medical and satellite image processing. It uses MATLAB® programs to present various techniques, including polynomial image interpolation and adaptive polynomial image interpolation. MATLAB codes for most of the simulation experiments supplied in the book are included in the appendix.

Example-Based Super Resolution Springer

A comprehensive volume that brings together authoritative overviews of single molecule science techniques from a biological perspective.

Pattern Recognition Springer Nature

This book contains some selected papers from the International Conference on Extreme Learning Machine 2015, which was held in Hangzhou, China, December 15-17, 2015. This conference brought

together researchers and engineers to share and exchange R&D experience on both theoretical studies and practical applications of the Extreme Learning Machine (ELM) technique and brain learning. This book covers theories, algorithms ad applications of ELM. It gives readers a glance of the most recent advances of ELM.

Single Image Super-resolution Based on Neural Networks for Text and Face Recognition

O'Reilly Media

The seven-volume set comprising LNCS volumes 8689-8695 constitutes the refereed proceedings of the 13th European Conference on Computer Vision, ECCV 2014, held in Zurich, Switzerland, in September 2014. The 363 revised papers presented were carefully reviewed and selected from 1444 submissions. The papers are organized in topical sections on tracking and activity recognition; recognition; learning and inference; structure from motion and feature matching; computational photography and low-level vision; vision; segmentation and saliency; context and 3D scenes; motion and 3D scene analysis; and poster sessions.

Recent Advances in Fluorescent Probes for Super-Resolution Microscopy
John Wiley & Sons
The proceedings set LNCS 13231, 13232, and 13233 constitutes the refereed proceedings of the 21st International Conference on Image Analysis and Processing, ICIAP 2022, which was held during May 23-27, 2022, in Lecce, Italy, The 168 papers included in the proceedings were carefully reviewed and selected from 307 submissions. They deal with video analysis and understanding; pattern recognition and machine learning; deep learning; multi-view geometry and 3D computer vision; image analysis, detection and recognition; multimedia; biomedical and assistive technology; digital forensics and biometrics; image processing for cultural heritage; robot vision; etc.
Image Mosaicing and Super-resolution
Springer Nature
This book encompasses the full breadth of the super-resolution imaging field, representing modern techniques that exceed the traditional diffraction limit, thereby opening up new

applications in biomedicine. It shows readers how to use the new tools to increase resolution in sub-nanometer-scale images of living cells and tissue, which leads to new information about molecules, pathways and dynamics. The book highlights the advantages and disadvantages of the techniques, and gives state-of-the-art examples of applications using microscopes currently available on the market. It covers key techniques such as stimulated emission depletion (STED), structured illumination microscopy (SSIM), photoactivated localization microscopy (PALM), and stochastic optical reconstruction microscopy (STORM). It will be a useful reference for biomedical researchers who want to work with super-resolution imaging, learn the proper technique for their application, and simultaneously obtain a solid footing in other techniques.

2019 IEEE International Conference on Unmanned Systems (ICUS)

CRC Press

This book investigates sets of images consisting of many overlapping viewsofa scene, and how the information contained within them may be combined to produce single images of

superior quality. The generic name for such techniques is frame fusion. Using frame fusion, it is possible to extend the fieldof view beyond that ofany single image, to reduce noise, to restore high-frequency content, and even to increase spatial resolution and dynamic range. The aim in this book is to develop efficient, robust and automated frame fusion algorithms which may be applied to real image sequences. An essential step required to enable frame fusion is image registration: computing the point-to-point mapping between images in their overlapping region. This sub problem is considered in detail, and a robust and efficient solution is proposed and its accuracy evaluated. Two forms of frame fusion are then considered: image mosaic ing and super-resolution. Image mosaicing is the alignment of multiple images into a large composition which represents part of a 3D scene. Super-resolution is a more sophisticated technique which aims to restore poor-quality video sequences by mod elling and removing the degradations inherent in the imaging process, such as noise, blur and spatial-sampling. A key element in this book is the assumption of a completely uncalibrated cam era. No prior knowledge of the camera parameters, its motion, optics or photometric characteristics is assumed. The power of the methods is illustrated with many real image sequence examples.

Hybrid Intelligent Systems BoD – Books on Demand

This book

features selected research papers presented at the First International Conference on Computing, Communications, and Cyber-Security (IC4S 2019), organized by Northwest Group of Institutions, Punjab, India, Southern Federal University, Russia, and IAC Educational Trust, India along with KEC, Ghaziabad and ITS, College Ghaziabad as an academic partner and held on 12 – 13 October 2019. It includes innovative work from researchers, leading innovators and professionals in the area of communication and network technologies, advanced computing technologies, data analytics and intelligent learning, the latest electrical and electronics trends, and security and privacy issues. *Smart and Sustainable Intelligent Systems* IOS Press 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. Su per-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 su per-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 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.

High-Resolution Electron Microscopy

Springer-Verlag

This book encompasses the full breadth of the super-resolution imaging field, representing modern techniques that exceed the traditional diffraction limit, thereby opening up new applications in biomedicine. It shows readers how to use the new tools to increase resolution in sub-nanometer-scale images of living cells and tissue, which leads to new information about molecules, pathways and dynamics. The book highlights

the advantages and disadvantages of the techniques, and gives state-of-the-art examples of applications using microscopes currently available on the market. It covers key techniques such as stimulated emission depletion (STED), structured illumination microscopy (SSIM), photoactivated localization microscopy (PALM), and stochastic optical reconstruction microscopy (STORM). It will be a useful reference for biomedical researchers who want to work with super-resolution imaging, learn the proper technique for their application, and simultaneously obtain a solid footing in other techniques.

Computational Intelligence Methods for Super-Resolution in Image Processing Applications

Springer Science & Business Media

The conference solicits high quality original research papers in any aspect of multimedia big data Topics include, but are not limited to New theory and models for multimedia big data computing Ultra high efficiency compression, coding and transmission for multimedia big data Content analysis and mining for multimedia big data Semantic retrieval of multimedia big data Deep learning and cloud computing for multimedia big data Green computing for multimedia big data (e g, high efficiency

storage) Security and privacy in multimedia big data Multimedia big data systems Novel and incentive applications of multimedia big data in various fields (e g, search, healthcare, transportation, retail)

Electrogenerated Chemiluminescence John Wiley & Sons Example-Based Super Resolution provides a thorough introduction and overview of example-based super resolution, covering the most successful algorithmic approaches and theories behind them with implementation insights. It also describes current challenges and explores future trends. Readers of this book will be able to understand the latest natural image patch statistical models and the performance limits of example-based super resolution algorithms, select the best state-of-the-art algorithmic alternative and tune it for specific use cases, and quickly put into practice implementations of the latest and most successful example-based super-resolution methods. Provides detailed coverage of techniques and implementation details that have been successfully introduced in diverse and

demanding real-world applications Covers a wide variety of machine learning approaches, ranging from cross-scale self-similarity concepts and sparse coding, to the latest advances in deep learning Presents a statistical interpretation of the subspace of natural image patches that transcends super resolution and makes it a valuable source for any researcher on image processing or low-level vision **The Life and Times of Matthew Maguire, Founder of Labor Day** CRC Press Deep Learning through Sparse Representation and Low-Rank Modeling bridges classical sparse and low rank models-those that emphasize pro blem-specific I nterpretability-with recent deep network models that have enabled a larger learning capacity and better utilization of Big Data. It shows how the toolkit of deep learning is closely tied with the sparse/low rank methods and algorithms, providing a rich variety of theoretical and analytic tools to guide the design and interpretation of deep learning models. The development of the theory and models is supported by a wide variety of

applications in computer vision, machine learning, signal processing, and data mining. This book will be highly useful for researchers, graduate students and practitioners working in the fields of computer vision, machine learning, signal processing, optimization and statistics. Combines classical sparse and low-rank models and algorithms with the latest advances in deep learning networks Shows how the structure and algorithms of sparse and low-rank methods improves the performance and interpretability of Deep Learning models Provides tactics on how to build and apply customized deep learning models for various applications

Image Analysis and Processing – ICIAP 2022 Springer Nature This book describes how to see atoms using electron microscopes. This new edition includes updated sections on applications and new uses of atomic-resolution transmission electron microscopy. Several new chapters and sources of software for image interpretation and electron-optical design have also been added.

Soft Computing for Problem Solving Tony Northrup Deep learning is often viewed as the exclusive domain of math PhDs and big

tech companies. But as this hands-on guide demonstrates, programmers comfortable with Python can achieve impressive results in deep learning with little math background, small amounts of data, and minimal code. How? With fastai, the first library to provide a consistent interface to the most frequently used deep learning applications. Authors Jeremy Howard and Sylvain Gugger, the creators of fastai, show you how to train a model on a wide range of tasks using fastai and PyTorch. You ' ll also dive progressively further into deep learning theory to gain a complete understanding of the algorithms behind the scenes. Train models in computer vision, natural language processing, tabular data, and collaborative filtering Learn the latest deep learning techniques that matter most in practice Improve accuracy, speed, and reliability by understanding how deep learning models work Discover how to turn your models into web applications Implement deep learning algorithms from scratch Consider the ethical implications of your work Gain insight from the

foreword by PyTorch cofounder, Soumith Chintala

ICDSMLA 2019 Springer

This book gathers selected high-impact articles from the 1st International Conference on Data Science, Machine Learning & Applications 2019. It highlights the latest developments in the areas of Artificial Intelligence, Machine Learning, Soft Computing, Human – Computer Interaction and various data science & machine learning applications. It brings together scientists and researchers from different universities and industries around the world to showcase a broad range of perspectives, practices and technical expertise.

ICDSMLA 2020 CRC Press

The four-volume set LNCS 6492-6495 constitutes the thoroughly refereed post-proceedings of the 10th Asian Conference on Computer Vision, ACCV 2009, held in Queenstown, New Zealand in November 2010. All together the four volumes present 206 revised papers selected from a total of 739 Submissions. All current issues in computer vision are addressed ranging from algorithms that attempt to automatically understand the content of images, optical methods coupled with computational techniques that enhance and improve

images, and capturing and analyzing the world's geometry while preparing the higher level image and shape understanding. Novel gemometry techniques, statistical learning methods, and modern algebraic procedures are dealt with as well.