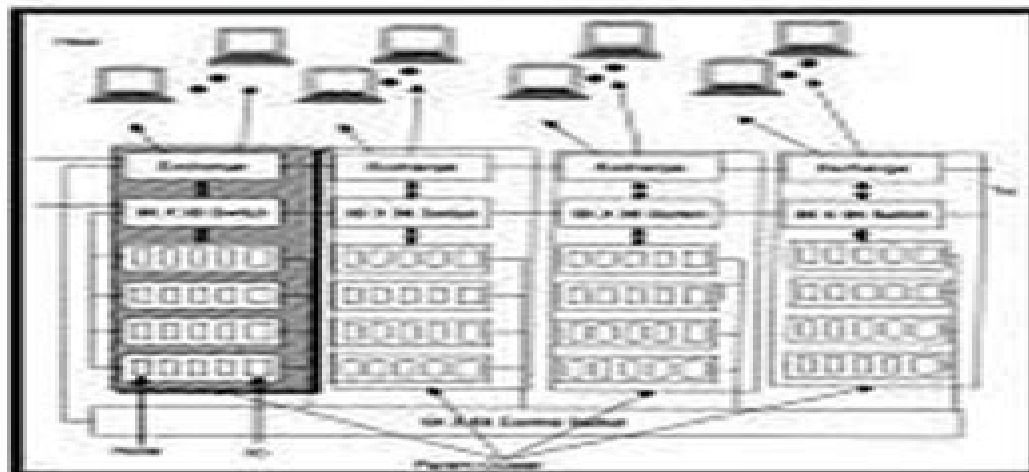


# Still Image Compression on Parallel Computer Architectures

Savitri Bevinakoppa



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# Still Image Compression On Parallel Computer Architectures

**James A. Storer**



## **Still Image Compression On Parallel Computer Architectures:**

Still Image Compression on Parallel Computer Architectures Savitri Bevinakoppa,1998-11-30 Still Image Compression on Parallel Computer Architectures investigates the application of parallel processing techniques to digital image compression Digital image compression is used to reduce the number of bits required to store an image in computer memory and or transmit it over a communication link Over the past decade advancements in technology have spawned many applications of digital imaging such as photo videotex desktop publishing graphics arts color facsimile newspaper wire phototransmission and medical imaging For many other contemporary applications such as distributed multimedia systems rapid transmission of images is necessary Dollar cost as well as time cost of transmission and storage tend to be directly proportional to the volume of data Therefore application of digital image compression techniques becomes necessary to minimize costs A number of digital image compression algorithms have been developed and standardized With the success of these algorithms research effort is now directed towards improving implementation techniques The Joint Photographic Experts Group JPEG and Motion Photographic Experts Group MPEG are international organizations which have developed digital image compression standards Hardware VLSI chips which implement the JPEG image compression algorithm are available Such hardware is specific to image compression only and cannot be used for other image processing applications A flexible means of implementing digital image compression algorithms is still required An obvious method of processing different imaging applications on general purpose hardware platforms is to develop software implementations JPEG uses an 8 8 block of image samples as the basic element for compression These blocks are processed sequentially There is always the possibility of having similar blocks in a given image If similar blocks in an image are located then repeated compression of these blocks is not necessary By locating similar blocks in the image the speed of compression can be increased and the size of the compressed image can be reduced Based on this concept an enhancement to the JPEG algorithm is proposed called Block Comparator Technique BCT Still Image Compression on Parallel Computer Architectures is designed for advanced students and practitioners of computer science This comprehensive reference provides a foundation for understanding digital image compression techniques and parallel computer architectures

**Still Image Compression on Parallel Computer Architectures**

Still Image Compression on Parallel Computer Architectures Savitri Bevinakoppa,2012-12-06 Still Image Compression on Parallel Computer Architectures investigates the application of parallel processing techniques to digital image compression Digital image compression is used to reduce the number of bits required to store an image in computer memory and or transmit it over a communication link Over the past decade advancements in technology have spawned many applications of digital imaging such as photo videotex desktop publishing graphics arts color facsimile newspaper wire phototransmission and medical imaging For many other contemporary applications such as distributed multimedia systems rapid transmission of images is necessary Dollar cost as well as time cost of transmission and storage tend to be directly proportional to the volume of data Therefore application of

digital image compression techniques becomes necessary to minimize costs. A number of digital image compression algorithms have been developed and standardized. With the success of these algorithms, research effort is now directed towards improving implementation techniques. The Joint Photographic Experts Group (JPEG) and Motion Photographic Experts Group (MPEG) are international organizations which have developed digital image compression standards. Hardware VLSI chips which implement the JPEG image compression algorithm are available. Such hardware is specific to image compression only and cannot be used for other image processing applications. A flexible means of implementing digital image compression algorithms is still required. An obvious method of processing different imaging applications on general purpose hardware platforms is to develop software implementations. JPEG uses an 8x8 block of image samples as the basic element for compression. These blocks are processed sequentially. There is always the possibility of having similar blocks in a given image. If similar blocks in an image are located, then repeated compression of these blocks is not necessary. By locating similar blocks in the image, the speed of compression can be increased and the size of the compressed image can be reduced. Based on this concept, an enhancement to the JPEG algorithm is proposed called Block Comparator Technique (BCT). Still Image Compression on Parallel Computer Architectures is designed for advanced students and practitioners of computer science. This comprehensive reference provides a foundation for understanding digital image compression techniques and parallel computer architectures.

Coding and Modulation for Digital Television Gordon M. Drury, Garik Markarian, Keith Pickavance, 2006-04-11. Coding and Modulation for Digital Television presents a comprehensive description of all error control coding and digital modulation techniques used in Digital Television (DTV). This book illustrates the relevant elements from the expansive theory of channel coding to how the transmission environment dictates the choice of error control coding and digital modulation schemes. These elements are presented in such a way that both the mathematical integrity and understanding for engineers are combined in a complete form and supported by a number of practical examples. In addition, the book contains descriptions of the existing standards and provides a valuable source of corresponding references. Coding and Modulation for Digital Television also features a description of the latest techniques providing the reader with a glimpse of future digital broadcasting. These include the concepts of soft in soft out decoding, turbo coding and cross-correlated quadrature modulation, all of which will have a prominent future in improving efficiency of the next generation DTV systems. Coding and Modulation for Digital Television is essential reading for all undergraduate and postgraduate students, broadcasting and communication engineers, researchers, marketing managers, regulatory bodies, governmental organizations and standardization institutions of the digital television industry.

**Electronic Business and Education** Wendy Chin, Frederic Patricelli, V. Milutinovic, 2012-12-06. In order to establish technical prerequisites for efficient electronic business and education on the Internet, appropriate system support is needed as a vital condition for maximization of both short-term and long-term profits. Electronic Business and Education: Recent Advances in Internet Infrastructures

discusses current research topics in the domain of system support for e business and e education on the Internet and stresses the synergistic interaction of these two components Attention is given to both scientific and engineering issues Electronic Business and Education Recent Advances in Internet Infrastructures is suitable as a secondary text for a graduate level course and as a reference for researchers and practitioners in industry particularly in the area of e business and e education on the Internet There is no longer any question that the Internet and electronic communication are the major new tools for collaborative advances in the creation of new knowledge and in future learning Excerpt from Foreword by Robert C Richardson Nobel Laureate 1996 Cornell University USA      *Infrastructure for Electronic Business on the Internet* Veljko Milutinovic, 2012-12-06 Design is an art form in which the designer selects from a myriad of alternatives to bring an optimum choice to a user In many complex of optimum is difficult to define Indeed the users systems the notion themselves will not agree so the best system is simply the one in which the designer and the user have a congruent viewpoint Compounding the design problem are tradeoffs that span a variety of technologies and user requirements The electronic business system is a classically complex system whose tradeoff criteria and user views are constantly changing with rapidly developing underlying technology Professor Milutinovic has chosen this area for his capstone contribution to the computer systems design This book completes his trilogy on design issue in computer systems His first work Surviving the Design of a 200 MHz RISC Microprocessor 1997 focused on the tradeoffs and design issues within a processor His second work Surviving the Design of Microprocessor and Multiprocessor Systems 2000 considers the design issues involved with assembling a number of processors into a coherent system Finally this book generalizes the system design problem to electronic commerce on the Internet a global system of immense consequence      *Shape Analysis and Retrieval of Multimedia Objects* Maytham H. Safar, Cyrus Shahabi, 2012-12-06 Shape Analysis and Retrieval of Multimedia Objects provides a comprehensive survey of the most advanced and powerful shape retrieval techniques used in practice today In addition this monograph addresses key methodological issues for evaluation of the shape retrieval methods Shape Analysis and Retrieval of Multimedia Objects is designed to meet the needs of practitioners and researchers in industry and graduate level students in Computer Science

**Multimedia Mining** Chabane Djeraba, 2012-12-06 Multimedia Mining A Highway to Intelligent Multimedia Documents brings together experts in digital media content analysis state of art data mining and knowledge discovery in multimedia database systems knowledge engineers and domain experts from diverse applied disciplines Multimedia documents are ubiquitous and often required if not essential in many applications today This phenomenon has made multimedia documents widespread and extremely large There are tools for managing and searching within these collections but the need for tools to extract hidden useful knowledge embedded within multimedia objects is becoming pressing and central for many decision making applications The tools needed today are tools for discovering relationships between objects or segments within multimedia document components such as classifying images based on their content extracting patterns in sound

categorizing speech and music and recognizing and tracking objects in video streams

## **Mastering E-Business**

**Infrastructure** Veljko Milutinovic, Frédéric Patricelli, 2012-12-06 As a foreword here we publish an email letter of Late Professor Herb Simon Nobel Laureate that he wrote on the occasion of the death of the father of a friend This letter of condolence more than any other wisdom tells about the essence of the process of scientific creation which is so important for both the specific subject being covered by this book and for the general science When asked to address an SSRR conference in Italy prior to his death Professor Herb Simon agreed that these lines be presented to all those who are interested in understanding the real essence of their own scientific struggle Dear Professor Milutinovic I want to extend my deepest sympathy to you and your family on the death of your father His career was a very distinguished one and his life spanned a most complex and difficult sequence of epochs in your country's history Our generation I am just a year younger than he was like all its predecessors leaves many tasks hopefully no more than it inherited for the next generation to take up but even knowing that it must be so does not remove one's sense of loss in the parting

## **Computer Architecture '98**

John Morris, 1998-06-01 The third in the series of the Australasian Computer Architecture Conferences ACAC98 was held in Perth Australia on the 2nd 3rd of February 1998 This year's submissions saw papers coming from Australia Austria China Germany Japan New Zealand Portugal Singapore Taiwan and the United States all presenting both novel as well as conventional architectural ideas The 20 papers presented in this volume also cover the vital area of connection between processors from geographically separated to closely coupled systems

## Signal Processing for Telecommunications and Multimedia

Tadeusz A. Wysocki, Bahram Honary, Beata J. Wysocki, 2005-12-28 The unprecedented growth in the range of multimedia services offered these days by modern telecommunication systems has been made possible only because of the advancements in signal processing technologies and algorithms In the area of telecommunications application of signal processing allows for new generations of systems to achieve performance close to theoretical limits while in the area of multimedia signal processing the underlying technology making possible realization of such applications that not so long ago were considered just a science fiction or were not even dreamed about We all learnt to adopt those achievements very quickly but often the research enabling their introduction takes many years and a lot of efforts This book presents a group of invited contributions some of which have been based on the papers presented at the International Symposium on DSP for Communication Systems held in Coolangubra on the Gold Coast Australia in December 2003 Part 1 of the book deals with applications of signal processing to transform what we hear or see to the form that is most suitable for transmission or storage for a future retrieval The first three chapters in this part are devoted to processing of speech and other audio signals The next two chapters consider image coding and compression while the last chapter of this part describes classification of video sequences in the MPEG domain

## Distributed Multimedia Retrieval Strategies for Large Scale Networked Systems

Bharadwaj Veeravalli, Gerassimos Barlas, 2006-10-11 Several works on multimedia storage appear in literature today but very

little if any have been devoted to handling long duration video retrieval over large scale networks Distributed retrieval of multimedia documents especially the long duration documents is an imperative step in rendering high quality high fidelity and cost effective services for network service providers Distributed Multimedia Retrieval Strategies for Large Scale Networked Systems presents an up to date research status in the domain of distributed video retrieval This professional book will include several different techniques that are in place for long duration video retrieval An experimentally tested technology under the JINI platform demonstrates a practical working system which serves as a feasibility study as well as the first step in realizing such a technology *Multimedia Encryption and Watermarking* Borko Furht,Edin Muharemagic,Daniel Socek,2006-10-03 Multimedia Encryption and Watermarking presents a comprehensive survey of contemporary multimedia encryption and watermarking techniques which enable a secure exchange of multimedia intellectual property Part I Digital Rights Management DRM for Multimedia introduces DRM concepts and models for multimedia content protection and presents the key players Part II Multimedia Cryptography provides an overview of modern cryptography with the focus on modern image video speech and audio encryption techniques This book also provides an advanced concept of visual and audio sharing techniques Part III Digital Watermarking introduces the concept of watermarking for multimedia classifies watermarking applications and evaluates various multimedia watermarking concepts and techniques including digital watermarking techniques for binary images Multimedia Encryption and Watermarking is designed for researchers and practitioners as well as scientists and engineers who design and develop systems for the protection of digital multimedia content This volume is also suitable as a textbook for graduate courses on multimedia security Advanced Wired and Wireless Networks Tadeusz A. Wysocki,Arek Dadej,Beata J. Wysocki,2005-12-17 Advanced Wired and Wireless Networks brings the reader a sample of recent research efforts representative of advances in the areas of recognized importance for the future Internet such as ad hoc networking mobility support and performance improvements in advanced networks and protocols Advanced Wired and Wireless Networks is structured to meet the needs of a professional audience in industry as well as graduate level students in computer science and engineering **Image and Text Compression** James A. Storer,2012-12-06 James A Storer Computer Science Dept Brandeis University Waltham MA 02254 Data compression is the process of encoding a body of data to reduce storage requirements With Lossless compression data can be decompressed to be identical to the original whereas with lossy compression decompressed data may be an acceptable approximation according to some fidelity criterion to the original For example with digitized video it may only be necessary that the decompressed video look as good as the original to the human eye The two primary functions of data compression are Storage The capacity of a storage device can be effectively increased with data compression software or hardware that compresses a body of data on its way to the storage device and decompress it when it is retrieved Communications The bandwidth of a digital communication link can be effectively increased by compressing data at the sending end and decom

pressing data at the receiving end Here it can be crucial that compression and decompression can be performed in real time

CIC'2000 Brian J. D'Auriol,Abdullah Abonamah,2000 **Delivering MPEG-4 Based Audio-Visual Services** Hari

Kalva,2005-12-01 Delivering MPEG 4 Based Audio Visual Services investigates the different aspects of end to end multimedia services content creation server and service provider network and the end user terminal Part I provides a comprehensive introduction to digital video communications MPEG standards and technologies and deals with system level issues including standardization and interoperability user interaction and the design of a distributed video server Part II investigates the systems in the context of object based multimedia services and presents a design for an object based audio visual terminal some of these features having been adopted by the MPEG 4 Systems specification The book goes on to study the requirements for a file format to represent object based audio visual content and the design of one such format The design introduces new concepts such as direct streaming that are essential for scalable servers The final part of the book examines the delivery of object based multimedia presentations and gives optimal algorithms for multiplex scheduling of object based audio visual presentations showing that the audio visual object scheduling problem is NP complete in the strong sense The problem of scheduling audio visual objects is similar to the problem of sequencing jobs on a single machine The book compares these problems and adapts job sequencing results to audio visual object scheduling and provides optimal algorithms for scheduling presentations under resource constraints such as bandwidth network constraints and buffer terminal constraints In addition the book presents algorithms that minimize the resources required for scheduling presentations and the auxiliary capacity required to support interactivity in object based audio visual presentations Delivering MPEG 4 Based Audio Visual Services is essential reading for researchers and practitioners in the areas of multimedia systems engineering and multimedia computing network professionals service providers and all scientists and technical managers interested in the most up to date MPEG standards and technologies **Handbook on Data**

**Management in Information Systems** Jacek Blazewicz,Wieslaw Kubiak,Tadeusz Morzy,Marek Rusinkiewicz,2012-12-06

This book is the sixth of a running series of volumes dedicated to selected topics of information theory and practice The objective of the series is to provide a reference source for problem solvers in business industry government and professional researchers and graduate students The first volume Handbook on Architecture of Information Systems presents a balanced number of contributions from academia and practitioners The structure of the material follows a differentiation between modeling languages tools and methodologies The second volume Handbook on Electronic Commerce examines electronic commerce storefront online business consumer interface business to business networking digital payment legal issues information product development and electronic business models The third volume Handbook on Parallel and Distributed Processing presents basic concepts methods and recent developments in the field of parallel and distributed processing as well as some important applications of parallel and distributed computing In particular the book examines such fundamental



issues in the above area as languages for parallel processing parallel operating systems architecture of parallel and distributed systems parallel database and multimedia systems networking aspects of parallel and distributed systems efficiency of parallel algorithms The fourth volume on Information Technologies for Education and Training is devoted to a presentation of current and future research and applications in the field of educational technology The fifth double volume on Knowledge Management contains an extensive fundamental coverage of the knowledge management field     **Scientific and Technical Aerospace Reports** ,1995 Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database     **Computational Science - ICCS 2008** ,2008     Sci-tech News ,1999

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