For further information see: www.cs.brandeis.edu/~dcc

PROGRAM

Data Compression Conference (DCC'99)

(Sponsored by the IEEE Computer Society TCCC)

Snowbird, Utah
March 29 - 31, 1999

COMMITTEE: J. Storer (DCC chair, Brandeis U.), M. Cohn (DCC program chair, Brandeis U.), A. Apostolico (Purdue/Padova), T. Bell (U. Canterbury), B. Carpentieri (U. Salerno), J. Cleary (U. Waikato), M. Effros (CalTech), A. Gersho (UC Santa Barbara), R. Gray (Stanford U.), P. Howard (AT&T), J. Kovacevic (Bell Labs), G. Langdon (UC Santa Cruz), A. Lempel (Technion), M. Marcellin (U. Arizona), A. Moffat (U. Melbourne), M. Rabbani (Kodak), K. Ramchandran (U. Illinois), J. Reif (Duke U.), E. Riskin (U. Washington), A. Rodriguez (Scientific Alanta), G. Sullivan (PictureTel), M. Vetterli, (UC Berkeley), J. Villasenor (UCLA), I. Witten (U. Waikato), H. Yokoo (Gunma U.), K. Zeger (UC San Diego), J. Ziv (Technion).

THEME: An international forum for current work on data compression and related areas. Topics of interest include but are not limited to: Source coding, quantization theory, parallel compression algorithms and hardware, lossless and lossy compression algorithms for specific types of data (including text, images, video, speech, music, maps, instrument data, graphics, animation, and bit-maps), data compression standards, bi-level coding, transform methods, wavelet and fractal techniques, string searching and manipulation, closest-match retrieval, minimal length encoding and applications to learning, system issues relating to data compression (including error control, data security, indexing, and browsing), medical imagery, scientific and space data.

SCHEDULE OVERVIEW:

Sunday Evening, March 28: Registration and Reception

Monday, March 29:

Morning:	Technical Sessions
Mid-Day:	Invited Presentation
Afternoon:	Technical Sessions

Tuesday, March 30:

Morning:	Technical Sessions
Mid-Day:	Technical Sessions
Late Afternoon:	Poster Session and Reception

Wednesday, March 31:

Morning:	Technical Sessions
Mid-Day:	Technical Sessions

SUNDAY EVENING

Registration / Reception, 7:00-10:00pm (Golden Cliff Room)

MONDAY

Welcome: 7:45am

Session 1: 8:00am - 10:00am

8:00am
Generalized Multiple Description Vector Quantization
M. Fleming, M. Effros
California Institute of Technology

8:20am
Multiple Description Lattice Vector Quantization
S.D. Servetto, V.A. Vaishampayan, N.J.A. Sloane
University of Illinois at Urbana-Champaign, AT&T Shannon Laboratory

8:40am
Joint Image Compression and Classification with Vector Quantization and a Two Dimensional Hidden Markov Model
J. Li, R. M. Gray, and R. Olshen
Stanford University

9:00am
Reduced Comparison Search for the Exact GLA
T. Kaukoranta, P. Franti, O. Nevalainen
University of Turku, University of Joensuu

9:20am
Bit Rate on Demand using Pruned Tree-Structured Hierarchical Lookup Vector Quantization
K. Mukherjee, A. Mukherjee, T. Acharya
University of Central Florida, Intel Co.

9:40am
Joint Source-Channel Coding for Progressive Transmission of Embedded Source Coders
V. Chande, N. Farvardin
University of Maryland

Break: 10:00am - 10:20am

(MONDAY CONTINUED)

Session 2: 10:20am - 12:10pm

10:20am
Embedded Post-Processing for Enhancement of Compressed Images
A. Nosratinia
Rice University

10:40am
Multiple Description Decoding of Overcomplete Expansions Using Projections onto Convex Sets
P.Chou, S.Mehrotra, A. Wang
Microsoft Inc.

11:00am
Rate-Distortion Analysis of Spike Processes
B. Weidmann, M. Vetterli
Swiss Federal Institute of Technology, University of California at Berkeley

11:20am
Graceful Degradation over Packet Erasure Channels through Forward Error Correction
E. Mohr, E. A. Riskin, R. E. Ladner
University of Washington

11:40am
Context Quantization with Fisher Discriminant for Adaptive Embedded Wavelet Image Coding
X. Wu
University of Western Ontario
and
Low Complexity High-Order Context Modeling of Embedded Wavelet Bit Streams
X. Wu
University of Western Ontario

Lunch Break: 12:10pm - 2:30pm

Mid-Day Invited Presentation: 2:30pm - 3:30pm
"Quantum Computing and Data Compression"
Prof. John H. Reif
Duke University

Break: 3:30pm - 4:00pm

(MONDAY CONTINUED)

Session 3: 4:00pm - 5:40pm

4:00pm
Software Synthesis of Variable-length Code Decoder using a Mixture of Programmed Logic and Table Lookups
G. Cheung, S. McCanne, C. Papadimitriou
M4 Laboratories, University of California at Berkeley

4:20pm
Utilizing Soft Information in Decoding of Variable Length Codes
J. Wen, J. Villasenor
University of California at Los Angeles

4:40pm
Progressive Joint Source-Channel Coding in Feedback Channels
J. Lu, A. Nosratinia, B. Aazhang
Rice University

5:00pm
Quadtree Classification and TCQ Image Coding
B.A. Banister, T.R. Fischer
Washington State University

5:20pm
Distributed Source Coding Using Syndromes (DISCUS): Design and Construction
S. S. Pradhan, K. Ramchandran
University of Illinois at Urbana-Champaign

Break: 5:40pm - 6:00pm

Session 4: 6:00pm - 7:20pm

6:00pm
Linear Global Detectors of Redundant and Rare Substrings
A. Apostolico, M.E. Bock, S. Lonardi
Purdue University

6:20pm
Universal Lossless Source Coding with the Burrows Wheeler Transform
M. Effros
California Institute of Technology

6:40pm
Modification of the Burrows and Wheeler Data Compression Algorithm
B. Balkenhol, S. Kurtz, Y. M. Shtarkov
Universitat Bielefeld, Institute for Problems on Information Transmission

7:00pm
Text Mining: A New Frontier for Lossless Compression
H. Witten, Z. Bray, M. Mahoui, W. Teahan
University of Waikato

TUESDAY

Session 5: 8:00am - 10:00am

8:00am
A Streaming Piecewise-Constant Model
P.J. Ausbeck Jr.
Netcelerate Software, Inc.

8:20am
Memory Efficient Scalable Line-based Coding
E. Ordentlich, D. Taubman, M. Weinberger, G. Seroussi, M. W. Marcellin
Hewlett-Packard Co., University of Arizona

8:40am
A Blending Model for Efficient Compression of Smooth Images
J. Mayer
Universidade Federal de Santa Catarina

9:00am
The Effect of Flexible Parsing for Dynamic Dictionary Based Data Compression
Y. Matias, N. Rajpoot, S. C. Sahinalp
Tel-Aviv University, Yale University, University of Warwick

9:20am
Single Resolution Compression of Arbitrary Triangular Meshes with Properties
C. L. Bajaj, V. Pascucci, G. Zhuang
University of Texas

9:40am
Protein is Incompressible
C. G. Nevill-Manning, I. H. Witten
Rutgers University, University of Waikato

Break: 10:00am - 10:20am

(TUESDAY CONTINUED)

Session 6: 10:20am - 12:20pm

10:20am
Two Space–Economical Algorithms for Calculating Minimum Redundancy Prefix Codes
R. L. Milidiu, A. A. Pessoa, E. S. Laber
Pontificia Universidade Catolica

10:40am
A Work Efficient Parallel Algorithm for Constructing Huffman Codes
R. L. Milidiu, E. S. Laber, A. A. Pessoa
Pontificia Universidade Catolica

11:00am
Data Compression Using Long Common Strings
J. Bentley, D. McIlroy
Lucent Technologies, Dartmouth College

11:20am
Offline Dictionary-Based Compression
N. J. Larsson, A. Moffat
Lund University, University of Melbourne

11:40am
Random Access Decompression using Binary Arithmetic Coding
H. Lekatsas, W. Wolf
Princeton University

12:00pm:
Almost Optimal Fully LZW-Compressed Pattern Matching
L. Gasieniec, W. Rytter
University of Liverpool

Lunch Break: 12:20pm - 2:00pm

(TUESDAY CONTINUED)

Session 7: 2:00pm - 3:40pm

2:00pm
Quantized Frame Expansions as Source-Channel Codes for Erasure Channels
V.K. Goyal, J. Kovacevic, M. Vetterli
Lucent Technologies, Ecole Polytechnique Federale de Lausanne, University California Berkeley

2:20pm
Fast Progressive Wavelet Coding
H.S. Malvar
Microsoft Inc.

2:40pm
Source Code with Quantized Redundant Expansions: Accuracy and Reconstruction
Z. Cvetkovic
AT&T Shannon Laboratory

3:00pm
Constrained Wavelet Packets for Tree-Structured Video Coding Algorithms
H. Khalil, Jacquin, C. Podilchuk
University California Santa Barbara, Bell Laboratories

3:20pm
Binary Pseudowavelets and Applications to Bilevel Image Processing
S. Pigeon, Y. Bengio
Universite de Montreal

POSTER SESSION AND RECEPTION

4:30-7:30pm
In the Golden Cliff Room

(Abstracts of each presentation appear in the proceedings.)

WEDNESDAY

Session 8: 8:00am - 10:00am

8:00am
Real-Time VBR Rate Control of MPEG Video Based Upon Lexicographic Bit Allocation
D. T. Hoang
Sony Semiconductor Company of America

8:20am
Decision Trees for Error Concealment in Video Decoding
S. Cen, P. Cosman, F. Azadegan
University of California at San Diego, Rockwell Semiconductor Systems

8:40am
Complexity-Distribution Tradeoffs in Vector Matching Based on Probabilistic Partial Distance Techniques
K. Lengwehasatit, A. Ortega
University of Southern California

9:00am
Three-Dimensional Wavelet Coding of Video with Global Motion Compensation
A. Wang, Z. Xiong, P. Chou, S. Mehrotra
Microsoft, University of Hawaii

9:20am
A General Joint Source-Channel Matching Method for Wireless Video Transmission
L. Qian, D. L. Jones, K. Ramchandran, S. Appadwedula
University of Illinois at Urbana-Champaign

9:40am
2D-Pattern Matching Image and Video Compression: Preliminary Results
M. Alzina, W. Szpankowski, A. Grama
ENST, Purdue University

Break: 10:00am - 10:20am

(WEDNESDAY CONTINUED)

Session 9: 10:20am - 1:00pm

10:20am
A Simple Technique for Bounding the Pointwise Redundancy of the 1978 Lempel-Ziv Algorithm
J. C. Kieffer, E. H. Yang
University of Minnesota, University of Waterloo

10:40am
Codes for Data Synchronization with Timing
N. Kashyap, D. L. Neuhoff
University of Michigan Ann Arbor

11:00am
Variable-to-Fixed Length Codes and Plurally Parsable Dictionaries
S. A. Savari
Bell Laboratories / Lucent Technologies

11:20am
Iterative Decoding of Multiple Descriptions
M. Srinivasan
University of Maryland

11:40am
Performance of Quantizers on Noisy Channels using Structured Families of Codes
A. Mehes, K. Zeger
University of California at San Diego

12:00pm
Edge Adaptive Prediction for Lossless Image Coding
W.S. Lee
National University of Singapore

12:20pm
Adaptive Linear Prediction Lossless Coding
G. Motta, J. A. Storer, B. Carpentieri
Brandeis University, University of Salerno

12:40pm
Siclic:A Simple Inter-Color Lossless Image Coder
R. Barequet, M. Feder
Tel-Aviv University

Posters
(listed alphabetically by first author)

On Taking Advantage of Similarities Between Parameters in Lossless Sequential Coding
J. Aberg
Lund University

Performance Evaluation of Reversible Integer-to Integer Wavelet Transforms for Image Compression
M. D. Adams, F. Kossentini,
University of British Columbia

Move-to-Front and Permutation Based Inversion Coding
Z. Arnavut
State University of New York

Lexical Attraction for Text Compression
J. Bach, I. H. Witten
Humboldt University of Berlin, University of Waikato

Comparison and Application Possibilities of JPEG and Fractal-Based Image Compressing Methods in the Development of Multimedia Based Material
J. Berke
Pannon University

Joint Design of Progressive Fixed-Rate Source-Channel Codes
H. Brunk, N. Farvardin
University of Maryland

A General-Purpose Compression Scheme for Databases
A. Cannane, H. E. Williams, J. Zobel
RMIT University

Design Consideration for Multi-Lingual Cascading Text Compressors
C. Chi-Hung, Y. Zhang
National University of Singapore

A Perceptual-Based Layered Video Coder for Error Resilience
Y.-J. Chiu
Bell Laboratories, Lucent Technologies

An Open Interface for Probabilistic Models of Text
J. G. Cleary and W. J. Teahnan
U. Waikato

Word-based Compression Methods for Large Text Document
J. Dvorsky, J. Pokorny, V. Snasel
Charles University, Palacky University of Olomouc

Image Coding using Markov Models with Hidden States
S. Forchhammer
Technical University of Denmark

Rate-Distortion Optimized Spatial Scalability for DCT-Based Video Coding
M. Gallant, F. Fossentini
University of British Columbia

On Entropy Constrained Residual Vector Quantization Design
Y. Gong, M. K. H. Fan, C. Huang
Georgia Institute of Technology, Sorenson Vision, Inc.

Sorted Sliding Window Compression
U. Graef
Darmstadt University of Technology

Data Compression of Cutting Planes
Y. Guan, R. J. Moorhead
Mississippi State University

Resynchronizing Variable-Length Codes for Robust Image Transmission
S. S. Hemami, T. Chang, R. Lau
Cornell University, Digital Equipment Corp., Lucent Technologies

Finite Automata and Regularized Edge Preserving Wavelet Transform Scheme
S. W. Hong, P. Bao
The Hong Kong Polytechnic University

Motion Estimation Using Long Term Motion Vector Prediction
I . Ismaeil, A.Docef, F. Kossentini, R.Ward
University of British Columbia

Modified Viterbi Algorithm for Predictive TCQ
T. Ji, W. E. Stark
University of Michigan

Lossless Color Image Compression Using Chromatic Correlation
W. Jiang, L. T. Bruton
The University of Calgary

Zerotree Coding of Wavelet Coefficients for Image Data on Arbitrarily Shaped Support
A. Kawanaka, V. R. Algazi
Sophia University, University of California at Davis

A Fractional Chip Wavelet Zero Tree Codec for Video Compression
K. Kolarov, W. Lynch, Arrighi, B. Hoover
Interval Research Corporation

Improving Text Compression Ratios with the Burrows-Wheeler Transform
H. Kruse, A. Mukherjee
University of Central Florida

Vector Quantization of Video with Two Codebooks
K. K. Lin, R. M. Gray
Stanford University

Fast, Modified Z-Coding of Wavelet Pyramids
W. Lynch, K. Kolarov, B. Arrighi
Interval Research Corporation

Bounding the Compression Loss of the FGK Algorithm
R. L. Milidiu, E. S. Laber, A. A. Pessoa
PUC-Rio

Resynchronization Properties of Arithmetic Coding
P. W. Moo, X. Wu
University of Western Ontario

Optical Flow Based Motion Compensation and Video Compression using Hybrid Vector Quantization
K. Mukherjee, A. Mukherjee
University of Central Florida

Data Compression The Next Generation Space Telescope
M. A. Nieto-Santisteban, D. J. Fixsen, J. D. Offenberg, R. J. Hanisch, H. S. Stockman
Space Telescope Science Institute, Raytheon STX Corporation

Compressing ATM Streams On-Line
I. Papaefstathiou
University of Cambridge

Improved Joint Source-Channel Decoding for Variable-Length Encoded Data Using Soft Decisions and MMSE Estimation
M. Park, D. J. Miller
Penn State University

Fast Multi-Match Lempel-Ziv
M. S. Pinho, W.A. Finamore, W.A. Pearlman
Rensselaer Polytechnic Institute

Experiments with Single-Pass Adaptive Vector Quantization
F. Rizzo, J. A. Storer, M. Cohn, B. Carpentieri
Brandeis University, University of Salerno

Compression of SAR and Ultrasound Imagery Using Texture Models
J. G. Rosiles, M.J.T. Smith
Georgia Institute of Technology

A Modified Burrows-Wheeler Transformation for Case-insensitive Search with Application to Suffix Array Compression
K. Sadakane
University of Tokyo

Encoding Time Reduction in Fractal Image Compression
I. Salih, S. H. Smith,
Stevens Institute of Technology

Eigen Wavelet: Hyperspectral Image Compression Algorithm
S. Srinivasan, L. N. Kanal
LNK Corporation, Inc.

An Asymptotically Optimal Data Compression Algorithm Based On An Inverted Index
P. Subrahmanya
Qualcomm Inc.

Parallel Memories in Video Encoding
J. Tanskanen, J. Niittylahti
Tampere University of Technology

Lossless JBIG2 Coding Performance
D. Thompkins, F. Kossentini
University of British Columbia

Towards a Calibrated Corpus for Compression Testing
M. R. Titchener, P. M. Fenwick, M. C. Chen
The University of Auckland

New Methods for Multiplication-Free Arithmetic Coding
R. J. van der Vleuten
Philips Research Laboratories

A Video Code Based on R/D-Optimized Adaptive Vector Quantization
M. Wagner, R. Herz, H. Hartenstein, R. Hamzaoui, D. Saupe
Universitat Freiburg, Universitat Leipzig

A Novel Dual-Path Architecture for HDTV Video Decoding
N. Wang, N. Ling
Santa Clara University

Image Compression Based on Low-Pass Wavelet Transform and Multi-Scale Edge Compression
Part I: MSEC Model
X. Xue,
Harbin Institute of Technology

Image Compression Based on Low-Pass Wavelet Transform and Multi-Scale Edge Compression
Part II: Evidence and Experiments
X. Xue,
Harbin Institute of Technology

Reversible Variable Length Codes (RVLC) for Robust Coding of 3D Topological Mesh Data
Z. Yan, S. Kumar, J. Li, C. –C. J. Kuo
University of Southern California

Application of a Word-Based Text Compression Method to Japanese and Chinese Texts
S. Yoshida, T. Morihara, H. Yahagi, N. Satoh
Fujitsu Laboratories Ltd.

Modified SPIHT Encoding for SAR Image Data
Z. Zeng, I. Cummings
The University of British Columbia

Extending DACLIC for near Lossless Compression with Postprocessing of Greyscale Images
D. Zhao, Y. K. Chan, W. Gao
U. Hong Kong, Harbin Institute of Technology