

**Proceedings
1997 IEEE
International Symposium on
Information Theory**

**Maritim Hotel and Congress Center
Ulm, Germany**

June 29 - July 4, 1997

Sponsored by The Information Theory Society of
The Institute of Electrical and Electronics Engineers

Proceedings 1997 IEEE International Symposium on Information Theory

Copyright and Reprint Permission: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. All rights reserved. Copyright ©1997 by the Institute of Electrical and Electronics Engineers, Inc.

IEEE Catalog Number: 97CH36074

ISBN:	0-7803-3956-8	Softbound Edition
	0-7803-3957-6	Casebound Edition
	0-7803-3958-4	Microfiche Edition

Library of Congress: 72-179437

Additional copies of this publication are available from

IEEE Service Center
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08854-1331
1-800-678-IEEE

Table of Contents

Plenary Session I

The Way to the Proof of Fermat's Theorem — Frey, G. 1

Shannon Lecture I

Information Theoretic Methods in Probability and Statistics — Csiszár, I. 2

Plenary Session II

Practical Implementations of Cryptography — Landrock, P. 3

Shannon Lecture II

Back from Infinity: A Constrained Resources Approach to Information Theory — Ziv, J. 4

Plenary Session III

Source Coding in Multimedia — Rabiner, L.R. 5

Session MOAM1 Iterative Decoding

A General Algorithm for Distributing Information in a Graph — Aji, S.M. and McEliece, R.J. 6

Soft-Input Soft-Output Building Blocks to Construct and Iteratively Decode Code Networks —
Benedetto, S. and Montorsi, G. 7

Serial Concatenated Trellis Coded Modulation with Iterative Decoding —
Benedetto, S., Divsalar, D., Montorsi, G., and Pollara, F. 8

On the Performance of Recursive Decoding Schemes — Soljanin, E. and Urbanke, R. 9

Hybrid Concatenated Codes and Iterative Decoding — Divsalar, D. and Pollara, F. 10

Simultaneous Decoding and Phase Synchronization Using Iterative "Turbo" Decoding — Wiberg, N. 11

Approaching Shannon's Capacity Limit by 0.27 dB Using Hamming Codes in a
'Turbo'-Decoding Scheme — Nickl, H., Hagenauer, J., and Burkert, F. 12

Session MOAM2 Combinatorics and Sequences

Modularity Properties of Graph Entropy — Körner, J. and Simonyi, G. 13

Correlation Attacks on Stream Ciphers Using the Lempel-Ziv Algorithm — Penzhorn, W.T. 14

Pseudoredundant Measurements in Nonlinear Mappings — Arndt, C. and Loffeld, O. 15

On Higher Order Autocorrelation Properties of Golay Complementary Sequences — Braun, V. 16

Design of Sequences of I.I.D. p -ary Random Variables — Kohda, T. and Tsuneda, A. 17

Multiple Packing of Euclidean Sphere — Blinovsky, V. 18

Enumeration of Rare Events, Pyramid and Ball Cubic Lattices — Krichevskii, R.E. and Potapov, V.N. 19

On Efficient Inversion in Tower Fields of Characteristic Two — Fan, J.L. and Paar, C. 20

Data-Punctuated Token Trees — Berlekamp, E. and Hekuis, P. 21

Session MOAM3 Multi-User Channels

Arbitrarily Varying Multiple-Access Channels Part I. Ericson's Symmetrizability is Adequate,
Gubner's Conjecture is True. — Ahlswede, R. and Cai, N. 22

Arbitrarily Varying Multiple-Access Channels Part II. Correlated Sender's Side Information,
Correlated Messages, and Ambiguous Transmission — Ahlswede, R. and Cai, N. 23

Approximating the Output of the Multiple Access Channel — Steinberg, Y. 24

A New Perspective to AWGN Multi-Access Channels — Shu, L. 25

Generalized Time Sharing for Multiple Access Channels — Rimoldi, B. 26

Optimal Power Allocation over Parallel Gaussian Broadcast Channels — Tse, D.N. 27

The Capacity Region of Broadcast Channels with Memory — Goldsmith, A. and Effros, M.	28
A 2-D Weighing Procedure for Two-Way Communication — Schalkwijk, J.P.M. and Meeuwissen, H.B.	29
Iterative Multi-User Decoding for Asynchronous Users — Tarköy, F.	30

Session MOAM4 Communication Networks

Buffer Occupancy of Statistical Multiplexers with Periodic Interchangeable Traffic in ATM Networks — Yu, Z. and McEliece, R.J.	31
Transmission of Messages Using Parallel Servers: Asymptotic Approach — Vvedenskaya, N.D.	32
Large Deviations Analysis of MMPP/D/1 Queueing — Nakagawa, K.	33
An Independent Window-Access Scheme for an Input-Buffered Fast Packet Switching Fabric — Liu, Y.-S., Liu, Z.-J., and Hu, Z.	34
A New Toroidal Multi-Dimensional Network — Lee, L.L. and Centeno Filho, A.J.	35
A Distributed Optimal Routing Strategy Based on Estimation of the OD Matrix — Adibniya F.	36
Events with Exponentially Vanishing Probability have Exponentially Growing Waiting Time — Algoet, P.	37
Information Aging — Daneshgaran, F. and Mondin, M.	38

Session MOAM5 Sequences

Greedy Algorithms for the Shortest Common Superstring That are Asymptotically Optimal — Frieze, A. and Szpankowski, W.	39
Large Linear Complexity Sequences over Z_8 — Martinsen, H.M.	40
Periodic Binary Sequences with the "Trinomial Property" — Golomb, S.W. and Gong, G.	41
On the Classification of Binary Sequences of Period $2^n - 1$ with Ideal Autocorrelation — No, J.-S., Lee, H.-K., Chung, H., Yang, K., and Song, H.-Y.	42
On Cyclic Goppa Codes and Sequence Designs — Moreno, O.	43
Correlations of Pseudo-Generalized Geometric Sequences — Sun, W. and Yang, Y.X.	44
The Distribution of the Degree of Minimum-Degree Low-Weight Parity-Check Polynomials — Kühn, G.J.	45

Session MOAM6 CDMA I

Carrier Suppressed RAKE Receiver Operation for CDMA Cellular Communications — Kong, N.	46
Maximum Number of Users of a Random Signatures CDMA System with Adaptive Array Receivers over Multipath Fading Channel — Rapajic, P. and Kennedy R.	47
On Coherent Reception of Up-link Transmitted Signals in the DS-CDMA System — Jimenez, A. and Zigangirov, K.Sh.	48
A Multistage Detector for Synchronous Code-Division Multiple-Access — Louichon, F. and Georghiades, C.N.	49
Whitening Sequences in DS Spread Spectrum Communication — Hovakimyan, K.S. and Khachatrian, G.H.	50
MMSE Reception of DS-CDMA for Frequency-Selective Fading Channels — Miller, S.L., Honig, M.L., Shensa, M.J., and Milstein, L.B.	51
Complexity-Constrained Maximum-Likelihood Detection in Multiuser CDMA — Rasmussen, L.K., Lim, T.J., and Aulin, T.M.	52
(L,K) CDMA/ALOHA Multiple-Access System — Alrumaih, R.M. and Alsugair, A.A.	53

Shannon-Based Capacity Estimations of Future Microcellular Wireless Communication Systems — Hammerschmidt, J.S., Hasholzner, R., and Drewes, C.	54
--	----

Session MOAM7 Quantization I

Asymptotic Performance of Vector Quantizers with the Perceptual Distortion Measure — Li, J., Chaddha, N. and Gray, R.M.	55
Lattice Labeling Algorithms for Vector Quantization — Wang, C., Cao, H.Q., Li, W., and Tzeng, K.K.	56
Context-Based Entropy Coding of VQ Indexes — Wu, X., Wen, J., and NG, W.	57
Entropy Coded Successively Refinable Uniform Threshold Quantizers — Brunk, H., Jafarkhani, H., and Farvardin, N.	58
Quantization of Both Stationary and Nonstationary Gaussian Sources with Voronoi Constellations — Pépin, C., Belfiore, J.-C., and Boutros, J.	59
Polar Quantization Revisited — Neuhoff, D.L.	60
Low-Complexity Waveform Coding via Alphabet and Sample-Set Partitioning — Said, A. and Pearlman, W.A.	61
Structured Spherical Codes for Gaussian Quantization — Hamkins, J. and Zeger, K.	62

Session MOAM8 Compaction Methods

The Imaginary Sliding Window — Ryabko, B.	63
Context-Tree Weighting for Text-Sources — Volf, P.A.J.	64
Estimation of Escape Probabilities for PPM Based on Universal Source Coding Theory — Åberg, J., Shtarkov, Yu, M., and Smeets, B.J.M.	65
Ordering the Probabilities of an Unknown Discrete Memoryless Source — Sayir, J. and Ernst, T.	66
Two Results in Text Compression Algorithms — Wong, L., Wei, V.K., and Yeung, R.W.	67
Live-and-Die Coding for Binary Piecewise I.I.D. Sources — Willems, F. and Krom, M.	68
Lossless Volume Compression Using a Variation of Lempel-Ziv '77 — Chow, J. and Berger, T.	69
Universal Probability Assignment in the Class of Two-Sided Geometric Distributions — Merhav, N., Seroussi, G., and Weinberger, M.J.	70
Optimal Prefix Codes for Two-Sided Geometric Distributions — Merhav, N., Seroussi, G., and Weinberger, M.J.	71

Session MOPM1 Signal Theory

Error-Free Filtering of Entropy-Regular Process against a Background of Entropy-Singular Noise — Pinsker, M.S. and Prelov, V.V.	72
Sensitivity of the Rate-Distortion Function of Stationary Continuous-Time Gaussian Processes to Non-Gaussian Contamination — Pinsker, M.S., Prelov, V.V., and Verdú, S.	73
Robust Estimation of Point Process Intensity Features Using k -minimal Spanning Trees — Hero, A.O. and Michel, O.	74
Making MLSD-Decisions on Some Individual Symbols in a Sequence by Thresholding the Matched Filter Output — Ödling, P., Eriksson, H.B., and Börjesson, P.O.	75
Limitations of the Gaussian Model for Radar Signals — Nayebi, M.M. and Aref, M.R.	76
Nonlinear ECG Filtering by Group Normalized Wavelet Packets — Zhuoer, S., Zheng, B., Licheng, J., and Kun, M.	77
Estimation of Sampling Jitter Variance using Autocorrelation Function and Higher Order Statistics — Guerrero, A.P., Tourneret, J.-Y., and Aakvaag, N.	78

Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.