TABLE OF CONTENTS

FOREWORD i

PLENARY LECTURE

LOGIC AND LANGUAGE IN CONTROL THEORY 1
W.M. Wonham
University of Toronto

I-A: COMBINATORIAL ALGORITHMS

Chairman: F.P. Preparata
University of Illinois at Urbana-Champaign

COMPLEXITY RESULTS FOR VERTEX-DELETION BIPARTIZATION AND VIA MINIMIZATION PROBLEMS 4
H-A. Choi, K. Nakajima, and C.S. Rim

ALGORITHMS FOR REGULAR PROPERTIES IN RECURSIVE GRAPHS 14
S. Mahajan and J.G. Peters

AN OPTIMUM $\theta(n \log n)$ ALGORITHM FOR FINDING A CANONICAL HAMILTONIAN PATH AND A CANONICAL HAMILTONIAN CIRCUIT IN A SET OF INTERVALS 24
G.K. Manacher and T.A. Mankus

COMPUTING A CONDITIONAL EDGE-CONNECTIVITY OF A GRAPH 34
A-H. Esfahanian and S.L. Hakimi

SMALL-LARGE DYNAMIC PROGRAMMING FOR TREES 36
J. McHugh and Y. Perl

APPROXIMATE STRING MATCHING WITH CONTEXT-DEPENDENCY 46
A.A. Bertossi, E. Lodi, F. Luccio, and L. Pagli

DETERMINISTIC MOVE-TO-REAR LIST ORGANIZING STRATEGIES WITH OPTIMAL AND EXPEDIENT PROPERTIES 54
B.J. Oommen, E.R. Hansen, and J.I. Munro

AN INVESTIGATION OF SELF-ORGANIZING HEURISTICS FOR DOUBLY LINKED LISTS 64
M.E. Bellow

HOW WELL ARE BINARY SEARCH TREES BALANCED? 66
W. Szpankowski and V. Rego

I-B: ROBUST AND NONLINEAR CONTROL

Chairman: R. Ortega
National University of Mexico

NECESSARY AND SUFFICIENT CONDITIONS FOR STABILITY OF POLYTOPES OF MATRICES THROUGH TESTS OF LOWER DIMENSIONAL SUBSETS 72
C.L. DeMarco

SLIDING REGIMES IN ANALOG SIGNAL ENCODING AND DELTA MODULATION CIRCUITS 78
H. Sira-Ramirez

FEEDBACK STABILIZATION OF UNCERTAIN SYSTEMS 88
P.P. Khargonekar, I.R. Petersen, and K. Zhou

OBSERVER-BASED DESIGN OF UNCERTAIN SYSTEMS: RECOVERING STATE FEEDBACK ROBUSTNESS UNDER MATCHING CONDITIONS 97
F. Esfandiari and H.K. Khalil

CONTROL OF A PM STEPPER MOTOR USING NONLINEAR OBSERVERS AND CONTROLLERS 107
M. Zribi and J. Chiasson

KHARITONOV'S THEOREM: IS THERE A GENERALIZATION FOR DEPENDENT COEFFICIENT VARIATIONS? 117
B.R. Barmish

EIGENVALUE BOUNDS FOR THE SOLUTION OF DISCRETE STOCHASTIC RICCATI EQUATION 119
E. Yaz

ROBUST FLIGHT CONTROL SYSTEM DESIGN TECHNIQUE USING GAIN SPACE WITH PERFORMANCE AND HANDLING QUALITIES CONSTRAINTS 121
G. Aziz and J. Ho

I-C: DETECTION

Chairman: W.L. Root
University of Michigan

SOME RESULTS ON THE ROLE OF 2-ALTERNATING UPPER PROBABILITIES IN SIGNAL-PLUS-NOISE MODELS 123
A. Sadrolhefazi and T.L. Fine

BOUNDS ON THE VARIANCES OF IMPORTANCE SAMPLING SIMULATIONS IN DIGITAL COMMUNICATION SYSTEMS 125
D. Lu and K. Yao

ON THE APPLICATION OF IMPORTANCE SAMPLING TO THE ANALYSIS OF DETECTION SYSTEMS 135
G. Orsak and B. Aazhang

WALD'S IDENTITY AND SEQUENTIAL TEST PERFORMANCE WITH DEPENDENT DATA 145
J.S. Sadowsky

DISTRIBUTED DETECTION WITH CORRELATED SENSOR NOISE 155
R. Viswanathan, V. Aalo, and S.C.A. Thomopoulos

A DIFFERENTIAL GEOMETRIC APPROACH TOWARD ROBUST SIGNAL DETECTION IN NONSTATIONARY AND/OR DEPENDENT NOISE 163
M.W. Thompson and D.R. Halverson

SIGNAL DETECTION IN ARCTIC UNDER-ICE NOISE 172
P.A. Nielsen and J. Thomas

I-D: DIGITAL SIGNAL PROCESSING

Chairman: K.S. Arun
University of Illinois at Urbana-Champaign

DETECTION OF SPEECH SIGNALS AT THE OUTPUT OF A COCHLEAR MODEL 182
B. Monderer and A.A. Lazar

LIMIT CYCLES IN LINEAR SHIFT VARYING DIGITAL FILTERS 192
T. Bose and D.P. Brown

BEST ORDERINGS FOR FLOATING POINT ADDITION 199
T.G. Robertazzi and S.C. Schwartz

A RATIONAL VIEW OF THE FAST FOURIER TRANSFORM 201
C.M. Fiduccia

SPLIT LEVINSON ALGORITHM FOR TOEPLITZ MATRICES OF ANY RANK PROOFILE 203
M.K. Ciliz and H. Krishna

AN ALGORITHM FOR ESTIMATING THE FREQUENCIES AND AMPLITUDE MATRICES CORRESPONDING TO MULTIDIMENSIONAL HARMONIC SIGNALS IN NOISE 205
C. Foias, A.E. Frazho, and P.J. Sherman

ON THE OPTIMUM DELAY IN FREQUENCY-SAMPLING ALE 215
S.M. Kuo and M.A. Rodriguez

SYNTHESIS AND DESIGN OF STRUCTURALLY PASSIVE FULLY RECURSIVE HALF-PLANE 2-D DIGITAL FILTERS 217
S. Basu and K. Mahtre

I-E: PARALLEL PROCESSING

Chairman: B. Wah
University of Illinois at Urbana-Champaign

CONCURRENT PROCESSING WITH RESULT SHARING: AN EFFICIENT COMPUTING PARADIGM 227
S. Krishnaprasad

PARALLELIZING 'LEAST-COST' BRANCH-AND-BOUND ALGORITHMS 236
G. Lee

THE SIMPLE SIMON PROGRAMMING ENVIRONMENT: A STATUS REPORT 238
J.E. Cuny, D.A. Bailey, J.W. Hagerman, and A.A. Hough

THE LATTICE STRUCTURE OF A BUS ORIENTED MULTIPROCESSOR MODEL 248
A.A. Lazar and T.G. Robertazzi

MIXED-MODE COMPUTING WITH THE PASM SYSTEM PROTOTYPE 258
S.A. Fineberg, T.L. Casavant, and T. Schwederski

ONE-TO-K COMMUNICATION IN DISTRIBUTED-MEMORY MULTIPROCESSORS 268
H-A. Choi, A-H. Esfahanian, and L.M. Ni

II-A: DISCRETE EVENT SYSTEMS

Chairman: B.H. Krogh
Carnegie Mellon University

ON SYNCHRONIC-DISTANCE AND B-FAIR RELATIONS FOR PETRI NETS 270
M. Silva and T. Murata

INFINITESIMAL PERTURBATION ANALYSIS OF A MULTICLASS ROUTING PROBLEM 279
P. Vakili and Y-C. Ho

AUGMENTED CHAIN ANALYSIS OF MARKOV AND SEMI-MARKOV PROCESSES 287
S.G. Strickland and C.G. Cassandras

WEAK CONVERGENCE OF SAMPLE PATH DERIVATIVES FOR THE WAITING TIME IN A SINGLE SERVER QUEUE 297
M.A. Zazanis

CONSTRUCTION OF A T-BASE AND DESIGN OF A PERIODIC FIRING SEQUENCE OF A LIVE AND BOUNDED PETRI NET 305
Q.W. Ge, T. Tanida, N. Ono, and K. Onaga

T-COMPLEMENT PETRI NETS 315
R.S. Sreenivas

CONTROLLED PETRI NETS AND MAXIMALLY PERMISSIVE FEEDBACK LOGIC 317
B.H. Krogh

SUPERVISORY CONTROL WITH INFINITE-STRING SPECIFICATIONS 327
J.G. Thistle and W.M. Wonham

DECIDABILITY FOR TEMPORAL LOGIC IN CONTROL THEORY 335
J.F. Knight and K.M. Passino

II-B: LAYOUT AND WIRING

Chairman: M. Sarrafzadeh
Northwestern University

A LINEAR TIME ALGORITHM FOR CIRCULAR PERMUTATION LAYOUT 345
C.S. Rim, N.J. Naclerio, S. Masuda, and K. Nakajima

LAYOUTS OF GRAPHS OF ARBITRARY DEGREE 355
D.D. Sherlekar and J. JaJa

A LP APPROACH FOR OPTIMAL RECTANGLE ROUTING 365
Y.Y. Sung

SINGLE JOG RIVER ROUTING 373
T-C. Tuan and S.L. Hakimi

CHANNEL ROUTING WITH SUPERTERMINALS 375
G. Gudmundsson and S. Ntafos

A SUBOPTIMAL SOLUTION TO THE VIA PLACEMENT PROBLEM 377
T.F. Gonzalez and S. Kurki-Gowdara

THREE-LAYER WIRABILITY OF PLANAR LAYOUTS 387
T.F. Gonzalez and S-Q. Zheng

ON FINDING OBSTRUCTION SETS AND POLYNOMIAL-TIME ALGORITHMS FOR GATE MATRIX LAYOUT 397
R.L. Bryant, M.R. Fellows, N.G. Kinnersley, and M.A. Langston

II-C: ESTIMATION AND FILTERING

Chairman: J.B. Thomas
Princeton University

OPTIMAL JOINT PARAMETER AND STATE ESTIMATION OF LINEAR STOCHASTIC MIMO SYSTEMS USING PSEUDO-LINEAR IDENTIFICATION (PLID) 399
M.A. Hopkins and H.F. VanLandingham

A HYBRID METHOD OF ESTIMATING THE PARAMETERS OF ARMA MODELS 409
S. Li, Y. Zhu, and B.W. Dickinson

RELATIVE SUFFICIENCY 417
R.F. Popoli and J.M. Mendel

OPTIMAL AND SUBOPTIMAL FILTERING FOR LINEAR SYSTEMS DRIVEN BY SELF-EXCITED POISSON PROCESSES 426
M.A. Ingram and A.H. Haddad

AN ESTIMATION PROBLEM WITH A RANDOMLY PERTURBED LINEAR OPERATOR 436
M. Mobed and W.L. Root

SOME COMMENTS ON ESTIMATION OF RANDOM VARIABLES 446
A.E. Wessel and G.L. Wise

AN ERROR ANALYSIS FOR THE KALMAN FILTER APPLIED TO DATA CORRUPTED BY MULTIPLICATIVE NOISE 453
B.S. Chow and W.P. Birkemeier

II-D: IMAGE PROCESSING I: ANALYSIS AND SYNTHESIS

Chairman: D.C. Munson, Jr.
University of Illinois at Urbana-Champaign

EFFICIENT RECOGNITION OF HANDPRINTED CHARACTERS FROM TABLET-BASED INPUT 463
D.D. Kerrick and A.C. Bovik

USE OF FRACTAL PARAMETERS TO DETERMINE LOCAL SPATIO-TEMPORAL CHARACTERISTICS OF A TURBULENT POLLUTANT FROM VIDEO IMAGES 473
A. Ait-Kheddache and S.A. Rajala

DETERMINATION OF VELOCITY FIELDS FROM TIME-SEQUENTIALLY SAMPLED DATA 483
M. Rahgozar and J.P. Allebach

FAST ITERATIVE IMAGE RESTORATION ALGORITHMS 493
A.K. Katsaggelos and S.N. Efstratiadis

RESTORATION OF IMAGES DISTORTED BY SAMPLING JITTER 503
P. Shi and R.K. Ward

VECTOR DITHERING: BINARIZATION THROUGH UNCONVENTIONAL IMAGE PLANE TESSELLATION 513
T.S. Rao and G.R. Arce

II-E: LINEAR SYSTEMS

Chairman: P. Albertos
Univ. Politecnica de Valencia, Spain

LINEAR STABLE UNITY-FEEDBACK SYSTEM: NECESSARY AND SUFFICIENT CONDITIONS FOR STABILITY UNDER NONLINEAR ADDITIVE PLANT PERTURBATIONS 522
C.A. Desoer and M.G. Kabuli

EXTENDED ZEROS AND MODEL MATCHING 524
M.K. Sain and B.F. Wyman

TRANSFER MATRICES, POLYNOMIAL FRACTIONS AND REALIZATION OF CONTINUOUS-TIME LINEAR TIME-VARYING SYSTEMS 534
E. Emre, H-M. Tai, and J.H. Seo

CONDITIONS FOR EXISTENCE OF AN OPTIMAL CONTROL IN THE LQ REGULATOR PROBLEM FOR SINGULAR SYSTEMS 544
J.D. Cobb

STABILITY PARAMETERIZATIONS AND HIDDEN MODES IN TWO DEGREES OF FREEDOM CONTROL DESIGN 546
P.J. Antsaklis and O.R. Gonzalez

ON THE DISTANCE FROM AN UNCONTROLLABLE PAIR: A SUMMARY 556
M.A. Wicks and R.A. DeCarlo

MINIMUM EFFORT STATE FEEDBACK POLE-PLACEMENT FOR LINEAR MULTIVARIABLE SYSTEMS 558
N.F. Al-Muthairi and S.P. Bingulac

MEASURES OF CONTROLLABILITY AND OBSERVABILITY AND RESIDUES 560
D.K. Lindner, J. Babendreier, and A.M.A. Hamdan

OBSERVER POLE ASSIGNMENT USING EIGENVALUE SENSITIVITY 562
M.A. Choudhry and C.S. Sims

III-A: COMMUNICATIONS AND CODING

Chairman: W.E. Stark
University of Michigan

WORST-CASE ANALYSIS OF SPREAD-SPECTRUM SYSTEMS WITH OUTPUT QUANTIZATION 564
M.V. Hedge, W.E. Stark, and D. Teneketzis

DYNAMIC CLIPPING FOR DETECTION OF FH/BFSK SIGNALS WITH DIVERSITY 574
Y.K. Kim and C.C. Lee

AN EXPURGATED LOWER BOUND ON THE FREE EUCLIDEAN DISTANCE OF TRELLIS CODES 584
M. Rouanne and D.J. Costello, Jr.

RANDOM CODING BOUNDS FOR A FAMILY OF BALANCED ERROR-CORRECTING CODES 594
M.A. Herro and V. Telang

ON GENERALIZED ERROR CORRECTING TRELLIS CODES WITH BALANCED BINARY SYMBOLS 596
H.C. Ferreira, D.A. Wright, and A.L. Nel

EFFICIENT MAXIMUM-LIKELIHOOD DECODING OF THE EXTENDED NORDSTROM-ROBINSON CODE 598
A.D. Abbaszadeh and C.K. Rushforth

SOFT DECISION DECODING OF CONCATENATED CODES 600
A.A. Hassan and W.E. Stark

EFFICIENT ALGORITHMS FOR THE SEARCH OF ZERO-CONCURRING CODEWORDS 610
A. Vardy and Y. Be'ery

CYCLIC CODES AND THEIR WEIGHTS 620
V. Pless

PERFORMANCE OF HYBRID ARQ CODING FORMATS OVER A BINARY SYMMETRIC CHANNEL 622
G.M. Huffman and F.D. Garber