

CONTENTS

Contributors

I FINITE ALGEBRA

- High speed recursive realisations of small length DFTs 3
by T.E. Curtis and M.J. Curtis
- Generalisation of the number theoretic properties of 120 19
and 240 and their applications in cryptographic
security by S.J. Tabatabaian, O.R. Hinton and R.N.
Gorgui-Naquib
- The application of redundant number systems to the design 27
of VLSI recursive filters by S.C. Knowles and J.G.
McWhirter
- P-adic transforms in digital signal processing by 43
R.N. Gorgui-Naguib
- On non-separate error-correcting arithmetic codes by 55
I.K. Proudler
- Generalised number theoretic transforms in digital 67
signal processing by O.R. Hinton

II INVERSE PROBLEMS AND IMAGE PROCESSING

- Towards Bayesian image analysis by J. Besag 81
- Modelling and restoration of image sequences by 101
D.M. Titterington
- Maximum a posteriori detection-estimation of Bernoulli- 121
Gaussian processes by Y. Goussard, G. Demoment and
F. Monfront
- Correlation and smoothness constraints in the linear 139
inverse problem by D.L. Blanchard, C.H. Travis and
M.C. Jones
- Applying catastrophe theory to nonlinear model fitting 151
by A. van den Bos

| | |
|--|-----|
| The application of signal processing techniques to the digital coding of studio quality television signals by N.K. Lodge and R.J. Clarke | 161 |
| Statistical aspects of moment invariants in image analysis by K.V. Mardia and T.J. Hainsworth | 169 |
| A class of nonstationary image models and their applications by R. Wilson and S.C. Clippingdale | 189 |
| Quantitative analysis of 2-D magnetic resonance time domain signals by R. de Beer, D. van Ormondt and W.W.F. Pijnappel | 203 |
| Contrast as a measure of focus in synthetic aperture radar images by D. Blacknell and S. Quegan | 215 |
| Image data compression combining multiresolution, feature orientation and arithmetic entropy coding by M. Todd and R. Wilson | 229 |
| <u>III SPECTRAL ESTIMATION AND STATISTICAL TECHNIQUES</u> | |
| Model-based spectrum estimation by J.G. Proakis | 245 |
| Weight-variance and statistical efficiency by J.E. Hudson | 293 |
| Statistics of generalized eigenvalues for signal parameter estimation by R.N. Madan and S.U. Pillai | 299 |
| A Bayesian method for adaptive spectrum estimation using high order autoregressive models by A. Houacine and G. Demoment | 311 |
| A maximum likelihood algorithm for transient data by D.R. Farrier and A.R. Prior-Wandesforde | 325 |
| Correlation detection using multiple-scale filters and self-similar noise models by P.G. Earwicker and J.G. Jones | 337 |
| Spread and entropy inequalities for Wigner weight functions by A.J.E.M. Janssen | 347 |
| A multiresolution descriptor for nonstationary image processing by A. Calway and R. Wilson | 357 |
| Classification of point processes using principal component analysis by N.B. Jones, P.J.A. Lago and A. Parekh | 369 |

| | |
|---|-----|
| Autoregressive spectral analysis of point processes by P.J.A. Lago, A.P. Rocha and N.B. Jones | 385 |
| <u>IV ADAPTIVE FILTERING</u> | |
| Adaptive filter theory: past, present and future by S. Haykin | 399 |
| The family of fast least squares algorithms for adaptive filtering by M.G. Bellanger | 415 |
| A square-root form of the overdetermined recursive instrumental variable algorithm by B. Friedlander and B. Porat | 435 |
| Performance bounds for exponentially windowed RLS algorithm in a nonstationary environment by S. McLaughlin, B. Mulgrew and C.F.N. Cowan | 449 |
| Fast QRD-based algorithms for least squares linear prediction by I.K. Proudler, J.G. McWhirter and T.J. Shepherd | 465 |
| Fast nonlinear iterative algorithms for harmonic signal extrapolation by A.R. Figueiras-Vidal, J.R. Casar-Corredera, D. Docampo-Amoedo and A. Artés-Rodriquez | 489 |
| Avoiding two point boundary value problems in the maximum a priori estimate of noisy dynamical system variables by A. Graham and J. Smallwood | 505 |
| Adaptive cancellation of nonlinear echo in data communication systems by J. Chen, J. Vandewalle, D. Vandeputte, M. Vandeurzen and D. Sallaerts | 521 |
| <u>V LINEAR ALGEBRA</u> | |
| Singular value decomposition: a powerful concept and tool in signal processing by J. Vandewalle and D. Callaerts | 539 |
| Downdating QR decompositions by L. Eldén | 561 |
| Fast approximation of dominant harmonics by solving an orthogonal eigenvalue problem by L. Reichel and G. Ammar | 575 |
| Reliable and efficient techniques based on total least squares for computing consistent estimators in models with errors in the variables by S. Van Huffel and J. Vandewalle | 593 |

| | |
|---|-----|
| Implementing linear algorithms for dense matrices on a heterogeneous machine by S.C. Tran and D.J. Creasey | 605 |
| Matrix diagonalization algorithms for oversized problems on a distributed-memory multiprocessor by H. Park | 615 |
| <u>VI PARALLEL ALGORITHMS</u> | |
| Signal processing computational needs: an update by J.M. Speiser and H.J. Whitehouse | 633 |
| Linear algebra algorithms on distributed memory machines by Y. Robert and B. Tourancheau | 665 |
| Linear systolic arrays for constrained least squares problems by B. Yang and J.F. Böhme | 689 |
| A systolic square root covariance Kalman filter by F.M.F. Gaston and G.W. Irwin | 713 |
| A systolic Toeplitz linear solver by D.J. Evans and G.M. Megson | 725 |
| The performance of a parallel super-resolution algorithm for synthetic aperture radar images by G.C. Pryde, L.M. Delves and S.P. Luttrell | 739 |
| 2-D systolic solution to discrete Fourier transform by K.J. Jones | 749 |
| Parallel DFT algorithms for a distributed array of processors by R.C. Green and J.J. Soraghan | 763 |
| Parallel weight extraction from a systolic adaptive beamformer by T.J. Shepherd, J.G. McWhirter and J.E. Hudson | 775 |
| Checksum schemes for fault tolerant systolic computing by R.P. Brent, F.T. Luk and C.J. Anfinson | 791 |
| Simulation of Luk's SVD array using a transputer by G. de Villiers | 805 |