International Linear Algebra Society (ILAS) Symposium on Fast Algorithms for Control, Signals and Image Processing

Winnipeg, Manitoba, Canada: June 6–8, 1997

Report by P. N. Shivakumar

This International Linear Algebra Society (ILAS) Symposium was organized by the Institute of Industrial Mathematical Sciences (IIMS) at the University of Manitoba, Canada. The Symposium was a Participating Institutions Conference of the Institute for Mathematics and its Applications (IMA) and was co-sponsored by the Fields Institute, the Centre de Recherches Mathématiques (Montréal) and the Manitoba HVDC Research Center. The Principal Symposium Organizers were: P. N. Shivakumar (IIMS, Univ. of Manitoba), Dianne P. O'Leary (Univ. of Maryland), Hans Schneider (Univ. of Wisconsin–Madison), and Robert J. Plemmons (Wake Forest University, Winston-Salem).

The three-day meeting brought together researchers from the areas of Control Theory, Signal and Image Processing, and Computational Linear Algebra to discuss recent advances, trends, and future directions for research on fast algorithms. This interdisciplinary gathering emphasized modern methods in scientific computing and relevant linear algebra. On the first day, three two-hour short courses were given. Stephen Boyd (Stanford) spoke on Convex Optimization in Control, Signals and Image Processing; Raymond Chan (Hong Kong) discussed Iterative Methods for Toeplitz Systems; Tom Kailath (Stanford) gave an introduction to Fast Algorithms for Structured Matrices. These talks are available on the authors' websites. Plenary talks were given by C. C. Paige (McGill), G. W. Stewart (Maryland), Haesun Park (Minnesota), L.Kaufman (Bell Labs), M. Hanke (Karlsruhe), E. Chu (Guelph), and S. Qiao (McMaster). In addition there were six minisymposia and three contributed paper sessions. In all, there were about 80 participants in the Symposium.

An important feature of the meeting was the overlap with the Canadian Mathematical Society (CMS) Summer meeting (June 6–9). A special Session on Linear Algebra at the CMS Meeting (June 9) was organized by IIMS with main speakers Roger Horn (Utah) and Paul van Dooren (Louvain). This was a unique experience with the sessions of each meeting open to the other and having common coffee breaks, banquet and excursions. Several members of the Symposium also took part in a Graduate Student Seminar of CMS, organized by IIMS. The speakers were Hans Schneider and Paul van Dooren. Social occasions included the banquet, a 'Dinner in the City', and a CMS/ILAS barbecue. After the meeting there were many letters of praise regarding the scientific content and the friendly atmosphere of the meetings. A special issue of *Linear Algebra and Its Applications* will be devoted to papers presented at this Symposium.

$\mathbf{I}_{\text{stanbul}}\begin{bmatrix}1 & 9\\ 9 & 7\end{bmatrix}$ Sixth International Workshop on "Matrix Methods for Statistics"

İstanbul, Turkey: August 16–17, 1997

Report by Hans Joachim Werner

The Sixth International Workshop on "Matrix Methods for Statistics" was held on the top floor of The Marmara Hotel in İstanbul, Turkey, on Saturday–Sunday, August 16–17, 1997, the weekend immediately preceding the 51st Session of the *International Statistical Institute* (ISI). This Workshop was co-sponsored by the Turkish Scientific and Technical Research Council (TÜBİTAK), the Turkish Statistical Society, and the International Linear Algebra Society (ILAS). The Local Organizing Committee comprised Fikri Akdeniz (University of Çukurova, Turkey; chair), Ömer L. Gebizlioğlu (University of Ankara, Turkey), and Cemil Yapar (Karadeniz Technical University, Turkey). The International Programme Committee comprised R. William Farebrother (Victoria University of Manchester, England), Simo Puntanen (University of Tampere, Finland), George P. H. Styan (McGill University, Canada; vice-chair), and Hans Joachim Werner (University of Bonn, Germany; chair). This Workshop was the sixth in an ongoing series. The previous five Workshops were held as follows: (1) Tampere, Finland: August

1990, (2) Auckland, New Zealand: December 1992, (3) Tartu, Estonia: May 1994, (4) Montréal, Québec, Canada: July 1995, and (5) Shrewsbury, England: July 1996. The Seventh International Workshop on Matrices and Statistics, with Special Emphasis on Multivariate Analysis in Celebration of T. W. Anderson's 80th Birthday will be held in the Summer 1998; for further details contact George Styan at `styan@Math.McGill.CA`.

The purpose of this Workshop was to stimulate research and, in an informal setting, to foster the interaction of researchers in the interface between matrix theory and statistics. Participants came from Austria, Belgium, Bulgaria, Canada, Czech Republic, Estonia, Finland, Germany, Japan, The Netherlands, Portugal, Sweden, Switzerland, Turkey, United Kingdom, and the United States. Funding for some travel and local expenses was supported in part by the Turkish Scientific and Technical Research Council (TÜBİTAK).

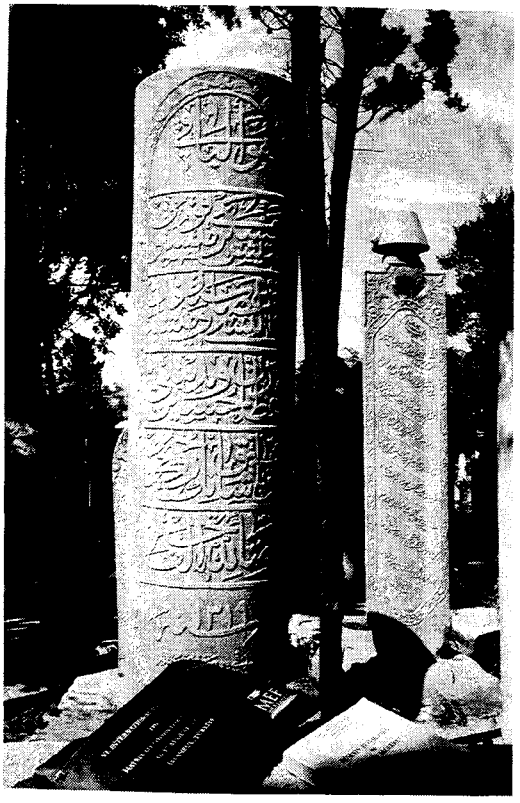
The Workshop began with a talk by the President of the Turkish Statistical Association: Ömer L. Gebizlioğlu, *Ankara University*, on: "The Turkish Statistical Association, Statistics in Turkey, and Statisticians in Turkey". This was followed by 35 papers presented in person in 8 plenary sessions; there were also 3 papers presented "by title". These 38 papers were

1. Abdul Sattar Rashid Salim AL-KHALİDİ *(Dokuz Eylul University, Izmir)*: Global Minimum Solutions of Nonparametric Estimation Problems for Truncated Distributions
2. T. W. ANDERSON *(Stanford University)*: Asymptotic Distributions of Characteristic Roots and Vectors with Different Rates of Convergence
3. Tsuyoshi ANDO *(Hokusei Gakuen University, Sapporo)*: Eigenvalue Inequalities for Hadamard Products
4. Olcay ARSLAN *(Çukurova University, Adana)* and Nedret BİLLOR* *(Çukurova University, Adana)*: Robust Liu Estimator for Regression Based on M-Estimator
5. Georgi N. BOSHNAKOV *(University of London and Bulgarian Academy of Sciences, Sofia)*: Multi-companion matrices
6. N. Rao CHAGANTY* *(Old Dominion University, Norfolk)*, John J. SWETITS *(Old Dominion University, Norfolk)* and Akhil K. VAISH *(University of North Carolina, Charlotte)*: Spectral Value Type Decomposition of a Positive Definite Matrix
7. Miroslav FIEDLER *(Academy of Sciences of the Czech Republic, Prague)*: Ultrametric Matrices and Cluster Analysis
8. Ömer L. GEBİZLİOĞLU* *(Ankara University)* and Fazıl A. ALİEV *(Ankara University)*: On the Robust Estimation for Discrete Space Spatial Processes
9. Gene H. GOLUB *(Stanford University)*: Efficient Algorithms for Least-squares Type Problems
10. Ulrike GRÖMPING *(University of Dortmund)*: One-sided Likelihood Ratio Tests for Linear Inequalities on the Parameters of Normal Linear Models
11. Patrick J. F. GROENEN* *(Leiden University)*, Willem J. HEISER *(Leiden University)* and Jacqueline J. MEULMAN *(Leiden University)*: Iterative Majorization in Distance Smoothing for Multidimensional Scaling to Avoid Local Minima
12. Ali S. HADI* *(Cornell University)* and Hans NYQUIST *(University of Umeå)*: Fréchet Distance as a Diagnostic Tool for Diagnosing Elliptically Symmetric Multivariate Data
13. Selahattin KAÇIRANLAR* *(Çukurova University, Adana)*, Sadullah SAKALLIOĞLU *(Çukurova University, Adana)*, Fikri AKDENİZ *(Çukurova University, Adana)* and George P. H. STYAN *(McGill University, Montréal)*: A New Biased Estimator in Linear Regression and Comparisons with Some Other Estimators
14. André KLEIN* *(University of Amsterdam)*, Guy MÉLARD *(Université Libre de Bruxelles)* and Toufik ZAHAF *(Université Libre de Bruxelles)*: Construction of the Exact Fisher Information Matrix of Time Series Models by means of Matrix Differentiation Rules
15. Tõnu KOLLO* *(University of Tartu)* and Maria ZELTSER *(University of Tartu)*: Pattern Matrix and Its Generalizations
16. Alexander KOVAČEC *(University of Coimbra)*: On some Occurrences and Characterizations of the Bruhat Order of the Symmetric Group
17. Wolfgang POLASEK *(University of Basel)* and Shuangzhe LIU* *(University of Basel)*: MANOVA Models: A Bayesian Analysis
18. Song-Gui WANG *(Chinese Academy of Sciences, Beijing)*, Erkki P. LISKI *(University of Tampere)* and Tapio NUMMI* *(University of Tampere)*: TWO-WAY Selection of Covariables in Multivariate Growth Curve Models
19. Fikri ÖZTÜRK* *(University of Ankara)* and Fikri AKDENİZ *(Çukurova University, Adana)*: Ill-Conditioning and Multicollinearity
20. Albert W. MARSHALL *(The University of British Columbia, Vancouver)* and Ingram OLKIN* *(Stanford University)*: Functional Equation Characterizations of Non-normal Distributions
21. Mustafa Ç. PINAR *(Bilkent University, Ankara)*: On the Finite Computation of the ℓ_1 Estimator from Huber's M-Estimator in Linear Regression
22. Vlastimil PTÁK *(Academy of Sciences of the Czech Republic, Prague)*: Geometric Means of Operators
23. Simo PUNTANEN *(University of Tampere)*: Comparing Estimators in Reduced Linear Models
24. Simo PUNTANEN* *(University of Tampere)* and George P. H. STYAN *(McGill University, Montréal)*: A Second Guide to Books on Matrices and Books on Inequalities, with Statistical and Other Applications
25. C. Radhakrishna RAO *(The Pennsylvania State University, University Park)*: Statistical Solutions to Some Matrix Problems
26. Burkhard SCHAFFRIN *(The Ohio State University)*: Softly Unbiased Estimation — Part I: The Gauss-Markov Model
27. Gülhan ALPARGU *(McGill University, Montréal)* and George P. H. STYAN* *(McGill University, Montréal)*: Some Comments on the Wielandt Inequality and Its Connection to the Frucht-Kantorovich Inequality

28. Gülhan ALPARGU *(McGill University, Montréal)* and George P. H. STYAN* *(McGill University, Montréal)*: A Further Bibliography on the Frucht-Kantorovich Inequality and on Some Related Inequalities
29. S. W. DRURY *(McGill University, Montréal)* and George P. H. STYAN* *(McGill University, Montréal)*: An Extension of an Inequality of Bloomfield-Watson and Knott
30. Yoshio TAKANE* *(McGill University, Montréal)* and Haruo YANAI *(National Center for University Entrance Examination, Tokyo)*: On Oblique Projectors
31. Ene-Margit TIIT *(University of Tartu)*: Boundary Correlation Matrices
32. Imbi TRAAT *(University of Tartu)*: A Note on Matrix Moments and Cumulants
33. Yimin WEI *(Fudan University, Shanghai)*: The Weighted Moore-Penrose Inverse of Modified Matrices
34. Hans Joachim WERNER *(University of Bonn)*: Some Matrix Methods for the General Gauss-Markov Model
35. Simo PUNTANEN *(University of Tampere)*, George P. H. STYAN *(McGill University, Montréal)* and Hans Joachim WERNER* *(University of Bonn)*: Two New Accessible Proofs that the Linear Estimator Gy is the Best Linear Unbiased Estimator
36. Yimin WEI *(Fudan University, Shanghai)* and Hans Joachim WERNER* *(University of Bonn)*: Some Further Results on $\{2\}$-Inverses
37. Kenichi KIKUCHI *(National Center for University Entrance Examination, Tokyo)* and Haruo YANAI* *(National Center for University Entrance Examination, Tokyo)*: Orthogonal Projectors onto the Intersection of Subspaces and Their Applications to Multivariate Linear Models
38. Cemil YAPAR* *(Karadeniz Technical University, Trabzon)*, İhsan ÜNVER *(Karadeniz Technical University, Trabzon)* and Selahattin MADEN *(Karadeniz Technical University, Trabzon)*: On Using Inequality Constrained Least Squares to Delineate the Effects of Misspecification in Linear Models

Please visit the website `http://eos.ect.uni-bonn.de/werner.html` for the complete Workshop Programme booklet, with abstracts (in English) of all 38 papers. Nicely printed (hard) copies of the two bibliographies [24] and [28], bound together (80 pp.), and/or soft copies in LaTeX, are available from George Styan: `styan@Math.McGill.CA`. It is expected that selected fully-refereed papers from this Sixth International Workshop will be published in the Seventh Special Issue on Linear Algebra and Statistics of *Linear Algebra and Its Applications*, edited by Simo Puntanen, George P. H. Styan and Hans Joachim Werner—the Sixth Special Issue has just been published: vol. 264 (October 1997).

A delicious Workshop Dinner (featuring çipura = gilt-head bream) was served at the Süper Köşem Restaurant by the edge of the Bosphorus, followed by an enjoyable Belly Dancer Show. Since many participants were accompanied by their spouses, Süheyla Akdeniz (Adana, Turkey) and Magdala Werner (Meckenheim, Germany) organized spontaneously two tours: a visit of the Topkapı Palace on the Saturday, and a Bosphorus Cruise on the Sunday. Many thanks go to both of them! Without their enormous help these tours would not have been possible.



In *Image*, No. 15, Summer 1995, p. 24, we challenged readers to identify a certain gentleman and asked "Is his book on Linear Algebra, published in 1882, the first book ever published on Linear Algebra?" In *Image*, No. 16, Winter 1996, p. 29, we identified the gentleman as Hüseyin Tevfik Paşa (1832–1901) and the book as *Linear Algebra*, published (in English) by A. H. Boyajian in Constantinople in 1882. Guided by Fikri Akdeniz, we visited the tomb of Hüseyin Tevfik Paşa in the Eyüp cemetery in İstanbul on Tuesday, August 19, 1997. The tomb (photo by Simo Puntanen) is located on the right-hand side of Beybaba Street on the way from the tomb of Ferhat Paşa to the tomb of Feridun Bey. The inscription on the tomb, translated into English, is "He is eternal. Pray for the soul of Hüseyin Tevfik Paşa from Vidin, member of the High Military Inspection Committee and one of the High Marshals."

"In the unpublished Memoirs of the noted Ottoman mathematician Salih Zeki, Hüseyin Tevfik Paşa appears as a man of exceptional ability and honest character who everywhere encouraged scientific research. He reached as high a point in his scientific endeavours as permitted by his sterile environment. This remarkable man in the history of science in Turkey was later almost entirely forgotten and all his works written in Turkish were regrettably lost! Of his venerable memory, only a street bearing his name in Vezneciler (a quarter of İstanbul south of the Golden Horn and west of the Sultan Ahmet Square or Hippodrome) and a mute tombstone in the Eyüp cemetery remain." —Kâzım Çeçen (1988), *Hüseyin Tevfik Paşa ve "Linear Algebra"*, İstanbul Teknik Üniversitesi Bilim ve Teknoloji Tarihi Araştırma Merkesi Yayın, no: 5, 1988, p. 15.