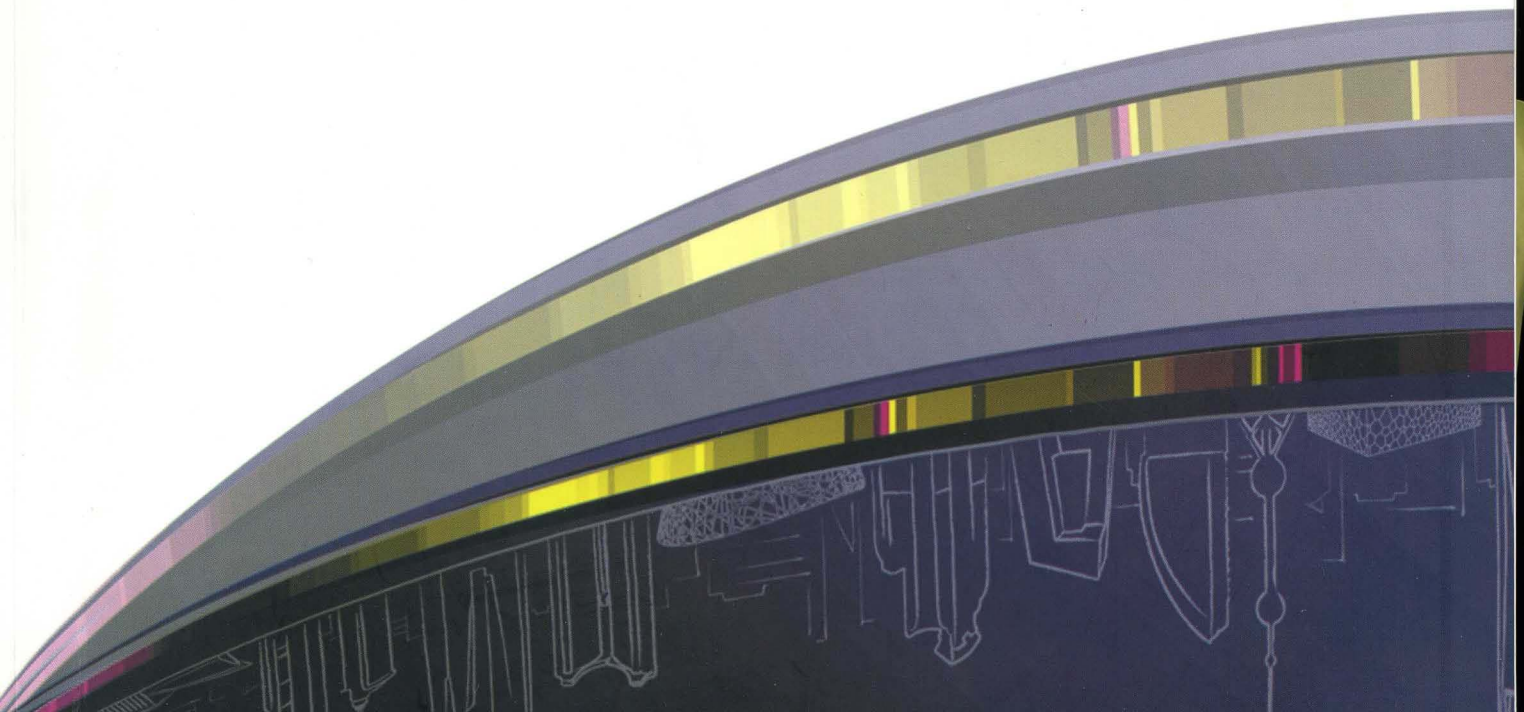**IWMS**

The 19th
International Workshop
on Matrices and Statistics

Shanghai Finance University
June 5–8, 2010 Shanghai China

The 19th International Workshop on Matrices and Statistics

5-8 June, 2010   Shanghai, China

Organizer

Shanghai Finance University

Co-organizers

Shanghai Normal University

E-institute of Computational Science of Shanghai Universities

Sponsors

National Natural Science Foundation of China

International Linear Algebra Society (ILAS)

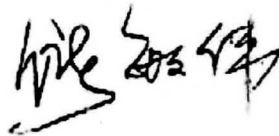SPSS China

Congratulation Address

On the occasion of 19th International Workshop on Matrices and Statistics being held, as the President of Shanghai Finance University, I express my sincere congratulations on behalf of all staff and students, and in my own name, to this workshop in Shanghai, China! I would like to extend a warm welcome to the 200 mathematicians, statisticians, financiers from 23 states and districts all over the world for participating in this workshop!

Shanghai Finance University (SHFU) is a full-time state-owned academic institution with about 60 years' history. SHFU is situated in Pudong New District. At present, the university has more than 8000 full-time students including more than 200 international students and a faculty of about 600. SHFU owns such teaching units as International Institute of Finance, International Trade Institute, School of Insurance, School of Public Economics & Administration, School of Accountancy, School of Business Administration, School of Information Management, Department of Applied Mathematics, Department of Humanities and Arts and Department of Foreign Language, and so on. The university emphasizes economics and management sciences and takes finance as its core.

It is well-known that the development of modern finance is closely tied to that of mathematics. In recent years quite a few applied mathematicians were awarded the Nobel Economics Prize. Mathematics has shown its great power on both portfolio and pricing. The 19 IWMS establishes the topics of matrix, statistics and finance and it will show the latest research results of mathematicians, statisticians and financial economists from all over the world which will positively promote our school's mathematical finance research and teaching.

This workshop falls on the convening of Expo 2010 Shanghai China. I hope that all experts enjoy the Expo in Shanghai. I wish you being healthy and joyful in Shanghai!

I wish 19th IWMS a complete success!

Min-Wei Chu, Professor of Finance
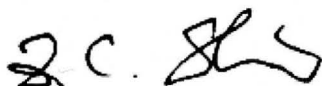President of Shanghai Finance University

Congratulation Address

As the chair of International Scientific Committee of 19th International Workshop on Matrices and Statistics, firstly, I thank all of the invited speakers for accepting our invitation to come to Shanghai to attend this workshop; At the same time; I also want to thank all of the participants from 23 countries and districts all over the world.   You are welcoming!

IWMS has been held for 20 years as a series of workshop. In the last 20 years, this international conference sets up a platform at the junction point of matrices and statistics which promotes the international exchange and cooperation in these fields. It is the first time for this series' workshop to be held in China. I wish to extend my warm congratulations on behalf of Chinese Society for Computational Mathematics!

It is well-known that matrix theory is fundamental in computational mathematics, and statistical computation and financial econometrics are connected with matrix problems closely. This conference is held at Shanghai Finance University under the topics "matrix, statistics and finance". I believe it will definitely promote cross-disciplinary researches between numerical algebra, statistics and finance, etc. It will also promote all matrix scientists, statisticians and financiers to exchange their ideas and scientific results.

I sincerely wish this workshop a great success!

Zhongci Shi
Chair, International Scientific Committee of IWMS
Member of Chinese Academy of Sciences
President, Chinese Society of Computational Mathematics
Fellow, Academy of Mathematics and Systems Science, Chinese Academy of Sciences

Welcome to IWMS 2010

As the Honorary Chair of the International Organizing Committee (IOC) of the "International Workshop on Matrices and Statistics" (IWMS) series, I would like to extend a special welcome to all the participants in this 19th IWMS in Shanghai, China. Many thanks go to Yonghui Liu, Chair of the Local Organizing Committee (LOC) and to Jeffrey J. Hunter, Chair of the IOC, for putting together such an excellent programme. Special thanks go also Simo Puntanen, whose encouragement and support of the IWMS has now extended continuously for twenty years!
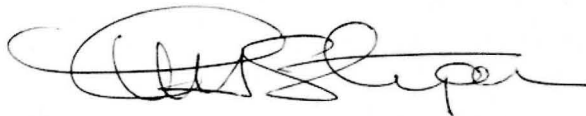
Organizing international meetings is a key part of our academic activities. This is what the Shanghai organizers are now doing: providing us with an opportunity for scientific communication and thereby are providing a highly important and appreciated service for the academic community.

It is hard to believe that over twenty years have passed since I first visited Shanghai and Beijing. In Beijing, Fuzhen Zhang was our host in 1988 and ten years later he chaired the LOC for the 7th IWMS held in Fort Lauderdale, Florida, December 1998, in celebration of T. W. Anderson's 80th birthday. Fuzhen introduced me to the work of Loo-Keng Hua (1910–1985), and I presented a paper on Hua's matrix equality based on our joint work (also joint with Christopher C. Paige and Bo-Ying Wang) at the 8th IWMS in Tampere, Finland, August 1999.

It was at the Workshop on Generalized Inverses in New Delhi, India, that I first saw Yongge Tian in December 1992, and I think it was over lunch in Montreal's Chinatown that Yongge Tian and Yonghui Liu and I first discussed together the possibility of holding an IWMS in Shanghai. I was very pleased that both Yongge and Yonghui joined us at the 16th IWMS in Windsor, Ontario, Canada.

I would like to extend a special welcome to new researchers in matrices and statistics, particularly to those who are participating now in an IWMS for the very first time. I believe that there have been students who discovered topics at an IWMS which led to a thesis for an MSc or PhD degree. I look forward, in particular, to meeting here in Shanghai at this 19th IWMS many young enthusiastic researchers in matrices and statistics. We older participants hope that youngsters will also experience the joy of working with matrices and statistics, from which we have benefited so much over these past several years.

Welcome!

George P. H. Styan, Professor Emeritus of Mathematics and Statistics
McGill University, Montréal (Québec), Canada: styan@math.mcgill.ca

Expression of thanks

On behalf of the International Organizing Committee, I first wish to thank Professor Yonghui Liu and his Local Organizing Committee for all the efforts that they have expended to ensure that this International Workshop on Matrices and Statistics is such a success. They have done an outstanding job with all the organisation details.

This workshop would not have been possible without the support of the sponsoring institutions including Shanghai Finance University, National Natural Science Foundation of China, Shanghai Normal University, and E-institute of Computational Science of Shanghai Universities. We are most grateful for this support.

This is the first time that this annual workshop has been held in China and it is especially significant that this international event is being held during the time that Expo 2010 Shanghai China is being held.

I wish to extend my appreciation to the invited speakers who have accepted invitations to present a wide selection of talks covering topics in the general area of "matrices and statistics". The invited speakers were chosen by the International Scientific Committee, under the excellent chairmanship of Professor Zhongci Shi. The committee has done an superb job of selecting such an internationally renown and diverse group of speakers.

I personally have appreciated the excellent cooperation that has been forged between myself, Professor Yonghui Liu and Professor Zhongci-Shi. We have all done our part to coordinate and work together to ensure the success of this meeting.

Finally, I wish to thank the participants of the workshop. At the time of compiling this brochure we had a total of 186 participants, with 69 contributed talks and 11 invited speakers. This is truly an international workshop, now well established, with this meeting being the nineteenth in the series. We owe a debt of gratitude to the vision and foresight of George Styan and Simo Puntanen who were members of the initial committee that set up these workshops, with the first meeting being held in Tampere in 1990. They are still members of the International Organising Committee and continue to actively shape and promote this series.

Thanks!

Jeffrey J Hunter, Chair, International Organizing Committee, IWMS-2010
Professor Emeritus of Statistics, Massey University, New Zealand
Adjunct Professor of Mathematical Sciences, Auckland University of Technology, New Zealand: jeffrey.hunter@aut.ac.nz
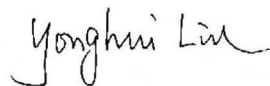
Expression of thanks

As the Chair of Local Organizing Committee (LOC) of the "19th International Workshop on Matrices and Statistics"(IWMS), I would like to welcome all the mathematicians, statisticians, financial experts from 23 states and districts all over the world for participating in this workshop! Many thanks go to Prof. Zhong-Ci Shi, Chair of International Scientific Committee (ISC) and Prof. Jeffrey J. Hunter, Chair of International Organizing Committee (IOC) for doing the excellent job for 19th IWMS.

It is always our dream to hold such an international workshop on matrices and statistics because it could help to provide a forum for the researchers and experts to exchange ideas. It also provides a stage for youngsters to show their research. More importantly, it may let more researchers outward China know China, Shanghai and Shanghai Finance University. We thank Prof. George P. H. Styan, Dr. Simo Puntanen and members of IOC to provide us this chance to hold this workshop. We also appreciate my advisor, Prof. Zhong-Ci Shi, Member of the Chinese Academy of Sciences to give us a great support to invite 11 outstanding invited speakers to give talks in plenary session. We thank Prof. Maya Neytcheva of Uppsala University to make her effort constantly for publishing our conference proceedings in the journal of Numerical Linear Algebra with Applications. We thank Prof. Jeffrey J. Hunter, chair of IOC and Prof. Hans Joachim Werner, cochairman of IOC to support us during preparing this workshop. We thank Chair Prof. Ben-Yu Guo, E-institute of computational science of Shanghai universities, for his effort to attain the support of Shanghai Computational Mathematics Community. We thank Prof. Min-Wei Chu, President of Shanghai Finance University and all other leaders of Shanghai Finance University for the fund support to prepare this workshop smoothly. We thank Prof. Rong-Xian Yue, Co-Chair of LOC, Shanghai Normal University for a lot of discussions to make the workshop more perfectly and satisfactorily. Special thanks go to all colleagues of Dept. of Applied Mathematics of Shanghai Finance University, Ms. Keyan Wang, Ms. Manrong Wang, Ms. Xiaobin Li, Dr. Yong Fang, Dr. Chungen Shen, Dr. Zhengyi Jiang, etc. for preparing this workshop. It is our superb team that makes the progress of the preparatory work smoothly!

Sincerely hope that all experts in Shanghai work well and happy!
Thank you!

Yonghui Liu

Yonghui Liu,
Chair of the Local Organizing Committee of IWMS2010
Professor of Mathematics, Dean of Dept. of Applied Mathematics
Shanghai Finance University

Schedule of IWMS 2010   `(First page of schedule)`

Friday,   June 4, 2010

18:30—19:00   A meeting of the members of International Organizing Committee

Saturday, June 5, 2010

8:45—9:20   Welcome and Opening Session
    1. Prof. Min-Wei Chu
    2. Prof. Zhong-Ci Shi
    3. Prof. George P.H.Styan
    4. Prof. Jeffrey J. Hunter
    5. Prof. Yonggoo Lee

9:20—9:40   Taking Photos

9:40—10:00   Tea Break

10:00—10:50   SESSION 1   (Conference hall)
    Invited speaker: Åke Björck   (Linköping University, Sweden)
    Gram-Schmidt Orthogonalization: 100 Years and More
    Session Chair: Zhong-Ci Shi   (Chinese Academy of Science, China)

10:50—11:40   SESSION 2   (Conference hall)
    Invited speaker: Owe Axelsson (Uppsala University, Sweden & Institute of
    Geonics,ASCR, Ostrava, Czech Republic)
    A General Framework for the Construction and Analysis of Preconditioners of
    Matrices on Two by Two Block Form
    Session Chair: George P. H. Styan   (McGill University, Canada)

11:40—13: 0   Lunch

13:30—14:20   SESSION 3   (Conference hall)
    Invited speaker: Guo-Fu Zhou (Washington University in St. Louis, USA
    and Shanghai Jiaotong University, China)
    Optimal Estimation of A Matrix toward Portfolio Choice: A Survey
    Session Chair: Zhi-Dong Bai (National University of Singapore & Northeast
    Normal University, China)