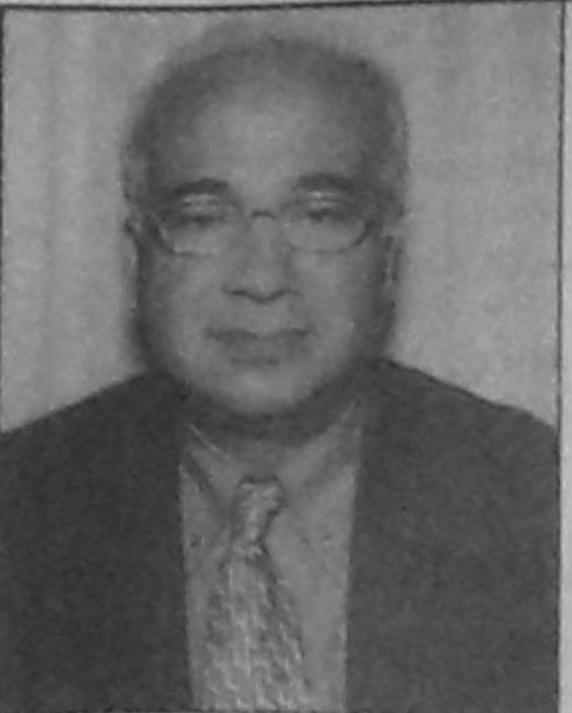




INTERNATIONAL CONFERENCE ON COMPUTER AND INFORMATION TECHNOLOGY NORTH SOUTH UNIVERSITY

January 25-26, 2001



MESSAGE

It gives me immense pleasure to know that North South University is hosting the International Conference on Computer and Information Technology (ICCIT 2000). Information technology plays, and will continue to play, a very vital role in the over all development of our society. This technology has opened the door for the best utilization of the resources spread all over this planet to enhance the living standard of the human civilization in a sustainable manner. I hope that ICCIT 2000 will offer a venue to the participants for cross-fertilization of new ideas for innovative use of IT for human benefit.

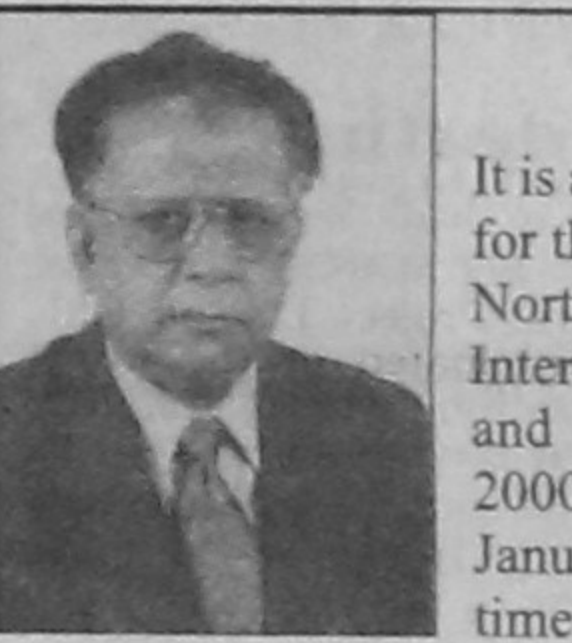
I thank the organizers of the ICCIT 2000 and also the participants from home and abroad and wish it all success.

Engineer Mosharrar Hossain
Minister
Ministry of Civil Aviation & Tourism
&
Ministry of Housing & Public Works
Govt. of the People's Republic of Bangladesh

ICCIT2000 Organizing Committee

- | | |
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- M. A. Raquib (NSU)
M. Khairul Anam (NSU)



MESSAGE

It is a matter of immense pride and honor for the Computer Science Department of North South University (NSU) to host the International Conference on Computer and Information Technology (ICCIT 2000) at the NSU premises during January 25-26, 2001. For the very first time a private university in Bangladesh is hosting such a prestigious international conference. This is truly a milestone for NSU. The theme of the conference **Development of Computer and Information Technology of the World in the New Millennium** embodies and emphasizes the importance of Computer and Information Technology (IT) at NSU. We assign very high priority to education and training of the conjoined modules, which will ever increasingly influence the future human life and the living. The participation of reputed scholars and computer experts will certainly advance computer education and training in Bangladesh. I hope this conference will also help enrich the teaching strategy of Computer Science and IT at NSU. Right at the advent of the new millennium, such a conference in a developing country like Bangladesh is both necessary and timely. I would like to congratulate the organizers of this conference and wish them great success.

Dr. Hafiz G. A. Siddiqi
Pro Vice Chancellor, North South University

Introduction: Keynote Speakers

Mohammad Karim
City College of CUNY Dean, School of Engineering
Steinman Hall, Room 142 West 138 Ave and Convent Street
E-mail: karim@ccny.cuny.edu

Mohammad Ataul Karim is Dean of Engineering at the City College of the City University of New York. He received his BS in physics from University of Dacca in 1976, MS degrees in physics and electrical engineering and a Ph.D. in electrical engineering from the University of Alabama in 1978, 1979, and 1982 respectively. Prior to becoming Dean at CCNY, he served as founding director of Electro-Optics Program for 8 years and as chair of Electrical and Computer Engineering for 4 years at the University of Dayton, Ohio, and as Head of Electrical and Computer Engineering for 2 years at the University of Tennessee.

Dr. Karim served as supervisor of graduate research of 20 doctoral and 30+ masters' students. He has authored six engineering textbooks, and over 300 scientific papers. He has been the guest editor of ten journal special issues, and currently serves as the North American Editor for "Optics and Laser Technology," Associate Editor of "IEEE Transactions on Education" and on the board of "Microwave and Optical Technology Letters." His research sponsors included the U.S. Army Night Vision Laboratory, Naval Research Laboratory, Air Force Office of Scientific Research, U.S. Department of Education, Wright Laboratory, Ohio Aerospace Institute, Defense Advance Research Program Agency, Ohio Board of Regents, and many others. Dr. Karim has been elected a fellow of both the Optical Society of America (OSA), and the Society of Photo-Instrumentation Engineers (SPIE). He is the current chair of the Electrical and Computer Engineering Division of the American Society of Engineering Education (ASEE).

ICCIT2000 at a glance

Preamble:
Computer and Information Technology is leading the worldwide revolution of improving productivity and quality of human life. Extensive attention and resources are being allocated worldwide for the development of this discipline. The innovation of new ideas and implementing them is the only way to take this field forward. Bangladesh have also joined in to bring more novelty into this field through the holding of an International Conference annually.

Historical Background:
In summer 1996, leading computer scientists stationed in Dhaka gathered in the Computer Science Department of Dhaka University to discuss the publication of a journal on computer and holding of a conference. The meeting ended with a firm determination to implement the both. Consequently, the first national conference on Computer Science was held at Dhaka University in December 1997.

Past Conferences:
The first International Conference on Computer and Information Technology under the code name ICCIT'98 was held on December 18-20, 1998, at BUET, Bangladesh. The Organizing Chair was Dr. M. Kaykobad, the then Professor and Head, Department of Computer Science and Engineering, BUET. They received about 117 papers out of which 63 were accepted. There were two keynote speakers. One was Dr. M. Karim, Professor and Chairman, Department of Electrical Engineering, University of Tennessee at Knoxville, USA. He presented a talk on Optical Digital Computing. The other one was Dr. Takao Nishizeki, Professor of Graduate School of Information Sciences, Tohoku University, Sendai, Japan. His talk was in the area of Cryptography.

The second such conference, ICCIT'99, was organized by Shahjalal

University of Science and Technology (SUST), Sylhet, Bangladesh, but the venue was shifted to BUET due to some extraneous circumstances and was held on December 3-5, 1999. The Organizing Chair was Dr. M. Zafar Iqbal, Head, Department of Electronics and Computer Science, SUST. About 98 papers were submitted out of which 57 were accepted after proper reviewing the manuscript. A Proceeding of the conference was published containing the all papers presented in the conference. There were four invited speakers: Dr. Phalguni Gupta of India on Algorithms, Dr. Amokoh Gyasi-Agyei of Finland on Systems and Logic Design, Dr. Mahbubur Rahman of USA on Networks, and Prof. Masayuki Numao of Japan on Artificial Intelligence.

ICCIT2000:
The venue for the ICCIT2000 was decided during the banquet of ICCIT'99 on December 4, 1999. North South University accepted to be the host of this annual event for the year 2000. However, due to the fasting month of Ramadhan being fallen in the month of December 2000, the conference date was fixed for November 25-26, 2000. However, the activity for the conference was started late in May 2000 and the date of the conference was shifted to January 25-26, 2001 due to the time conflict with the NSU convocation ceremony being scheduled on November 25, 2000.

After the formation of the Organizing Committee and the Program Committee the announcement for the Call for Papers was distributed to the world through internet. Most of the 102 papers were received by the submission deadline by October 31, 2000 and immediately sent to the reviewers. Notification of acceptance was sent to the authors during late November 2000. Camera-ready papers were received throughout the month of December 2000.

The next ICCIT2001 have been planned at Dhaka University in December 2001. A decision on this would likely to be announced during the banquet of ICCIT2000 on January 26, 2001.



MESSAGE

I am delighted that North South University is holding the International Conference on Computer and Information Technology (ICCIT 2000) at NSU premises, which has been organized by the Computer Science Department. Obviously, such a gathering and confluence of computer and IT experts will offer the Computer Science Department and for that matter the University, the opportunity to showcase itself to the technological connoisseurs from home and abroad, to the general public and the media. The theme of the conference, *Development of Computer and Information Technology of the World in the New Millennium*, is in keeping with the stated goal of Bangladesh to attain and enhance progress in the information technology. This is also emphasized and practiced ardently at NSU. The broad scope of the conference, presentation of and discussion on scholarly papers, deliberations and interactions with reputed global computer and IT experts will be a great boon for NSU, and for the advancement of computer expertise in general. I wish the organizers of this ICCIT 2000 in the NSU Computer Science Department the very best of luck and this conference a great success.

M. A. Kashem
Chairman, Board of Governors
North South University Foundation

PROGRAM COMMITTEE

- | | |
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| Farid Ahmed (USA) | S. K. Dhall (USA) |
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| Phalguni Gupta (India) | Hasan Jamil (USA) |
| S. Mahbubur Rahman (USA) | M. O. Tokhi (UK) |
| Seppo Halme (Finland) | D.C. Kar (USA) |
| M. A. Karim (USA) | B. S. Vasan (Australia) |
| S. Nakano (Japan) | M. Numao (Japan) |
| F. J. M. Salzbom (Australia) | Jamil Y. Khan (Australia) |
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| V.K. Krishnamurthy (Australia) | Arshad Momen (Bangladesh) |

BREAKUP OF ACCEPTED PAPERS

Grand total of accepted papers - 63

Institution wise breakup of the accepted papers from Bangladesh

Institution	No. of accepted papers
Bangladesh University of Engineering & Technology (BUET)	16
Dhaka University	4
Shahjalal University of Science & Technology	4
Islamic Institute of Technology (IIT) Gazipur	3
North South University	3
Dhaka University & Islamic University, Chittagong	2
Darul Ehsan & Dhaka University	2
Rajshahi University	2
Khulna University	1
Khulna University & BIT Gazipur	1
East West University	1
Total number of papers from Bangladesh	39

Country wise breakup of the accepted foreign papers

Country	Papers
USA	9
Japan	2
Singapore	1
Saudi Arabia	1
Canada	1
New Zealand	1
Total	15

Breakup of foreign papers with collaboration in Bangladesh

Country	Collaborating institution in Bangladesh	Papers
India	North South University	2
USA	BUET	1
	North South University	1
Japan	BUET	1
	Khulna University	1
Canada	North South University	1
	BUET	1
UK	Dhaka University	1
Total		9

ICCIT2000 Program at a glance

Thursday, January 25, 2001

9:00 9:45	Inaugural Session
9:45 10:30	Keynote Speech by Prof. M. Karim
10:30 11:15	Refreshment, Room 1630 Star Tower & Rooftop
11:15 12:45	Session 1a, Room 1600 Star Tower, Chair: Dr. Phalguni Gupta
	Session 1b, Room 1102 Star Tower, Chair: Dr. Zafar Iqbal
	Lunch
12:45 1:45	Keynote Speech by Dr. M. Kaykobad
1:45 2:30	Session 2a, Room 1600 Star Tower, Chair: Prof. R.I. Sharif
2:30 4:00	Session 2b, Room 1102 Star Tower, Chair: Dr. M. Masroor Ali
	Refreshment, Room 1630 Star Tower & Rooftop
4:00 4:30	Session 3, Room 1600 Star Tower, Chair: Prof. Setou Tadamasu
4:30 5:30	Dinner

Friday, January 26, 2001

8:45 9:30 AM	Keynote Speech by Dr. N.C. Debnath
9:30 11:00	Session 4, Room 1600 Star Tower, Chair: Dr. Shakil W. Ahmed
	Refreshment, Room 1630 Star Tower & Rooftop
11:00 11:30	Session 5, Room 1600 Star Tower, Chair: Dr. M. Lutfar Rahman
11:30 1:00	Prayer Break & Lunch
1:00 2:45	Keynote Speech by Prof. Shafiqur Rahman
2:45 3:30	Session 6, Room 1600 Star Tower, Chair: Dr. M. A. Mottalib
3:30 4:30	Poster Session, Room 100 BTA Tower, Refreshment
4:30 6:00	ICCIT2000 Dinner, Bukhara Rest., Speech by Prof. Jamilur Reza Chowdhury
7:30	

Saturday, January 27, 2001

10:00 1:00 & 2:00 4:00	Workshop on Software Engineering and Testing Conducted by Dr. N.C. Debnath Room 1600 Star Tower
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Narayan C. Debnath
Professor of Computer Science, Winona State University
Winona, MN 55987, USA, Debnath@vax2.winona.ms.edu

Dr. Narayan C. Debnath is serving as the Keynote Speaker of the International Conference of Computers and Information Technology (ICCIT) at the North South University, Dhaka, Bangladesh. Dr. Debnath is currently a Professor of Computer Science at Winona State University, Minnesota, USA. He is the Vice President of the International Society for Computers and Their Applications. Professor Debnath is a recipient of a Doctorate degree in Computer Science and a Doctorate degree in Applied Physics (Electrical Engineering). He served as the Acting Chairman of the Department of Computer Science and received numerous Honors and Awards. Dr. Debnath was a faculty of Computer Science at the University of Wisconsin, River Falls, USA, where he was nominated for the National Science Foundation Presidential Young Investigator Award in 1989, one of the most prestigious research awards for young researchers and scientists.

Dr. Debnath is known for his original research contribution on Software Engineering Models and Metrics. For the past several years, he has been working on research problems involving the development of software models, software complexity metrics and measures, abstraction of concurrent programs, and software design tools, techniques and environments. Dr. Debnath is an author or co-author of about 110 publications in numerous refereed journals and conference proceedings in Mathematics, Electrical Engineering, Computer Science and System Sciences.

Professor Debnath has made numerous teaching and research presentations in various national and international conferences, industries, and teaching and research institutions in Asia, Australia, Europe, North America, and South America. He served as the General Chair, Program Chair, Tutorial Chair and Session Chair of international conferences sponsored by various professional societies including the Society of Industrial and Applied Mathematics (SIAM), International Society for Computers and Their Applications (ISCA), International Association of Computer and Information Science (ACIS), International Association for Science and Technology in Education (IASTED). Dr. Debnath is a member of the SIAM, ACM, IEEE Computer Society, ISCA, and ACIS.

Mohammad Kaykobad
Professor of Computer Science
Bangladesh University of Engineering & Technology
Dhaka, Bangladesh. audwit@bdonline.com

Mohammad Kaykobad is a Professor of the Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology. He served as the Head of the Department for 3 years during 1996-1999. He received M.S (Hons.) in Engineering from Odessa Marine Engineering Institute in 1979. In 1982 he received an M.Eng. Degree from the Division of Computer Applications Technology, Asian Institute of Technology. He completed his Ph.D. Programme in 1986 from the Flinders University of South Australia. Dr. Kaykobad worked as a Senior Scientific Officer at the Institute of Computer Science, Atomic Energy Research Establishment for 3 years prior to joining the CSE Department, BUET in 1991. Dr. Kaykobad's research area is computer mathematics, theory of computational complexity and design and analysis of algorithms. He has published in journals like *Physical Review*, *International Journal of Computers and Mathematics*, *International Journal of Computers and Operations Research*, *Information Processing Letters*, *International Journal of Computer Mathematics*, *Linear Algebra and Its Applications*, *Information processing and Management*. In addition, he constantly contributes also to national conferences and journals. Dr. Kaykobad has to his credit 20 papers in international journals and over 30 in international conferences. He has written 3 books, an article in Wiley Encyclopedia and has edited several books for Bangladesh Text Book Board and Bangladesh Open University. Dr. Kaykobad is a frequent column writer in national dailies on various issues of national interest. He has also been able to guide undergraduate students to publish some papers in journals of international repute. Dr. Kaykobad has profound interest in improving programming skill in our youngsters. He led BUET teams to the World Finals of the Association for Computing Machinery International Collegiate Programming Contest for the last four years, including this year, in a row with a very honourable 11th place in year 2000. Dr. Kaykobad is an elected Fellow of the Bangladesh Academy of Sciences. He was given the best IT teacher award in 2000 by Bangladesh Computer Samitee



MESSAGE

We feel proud that the third International Conference on Computer and Information Technology (ICCIT2000) is being held on time keeping the trend to hold such a conference every year in Bangladesh. The Department of Computer Science of North South University has been a pioneer in quality computer education in Bangladesh and this time it showed the ability to organize successfully such a prestigious international event as scheduled.

The presence of the four distinguished keynote speakers, many renowned scholars as session chairs, and a leading IT expert as Banquet speaker would not only decorate the conference but also will help the nation with the latest information on technology and implementation of the IT related research in Bangladesh.

We welcome the authors and participants of the ICCIT2000 to North South University. To our foreign guests we wish a very pleasant stay in Dhaka.

Abul L. Haque
Organizing Chair, ICCIT2000

Shafiqur M Rahman
Dept. of Physics, Allegheny College, Meadville, PA16335, USA.
Phone: (814)-332-5331, e-mail: srahman@allegheny.edu

SHAFIQUR M. RAHMAN is a Professor of Physics at Allegheny College in the USA. He has served as Chairperson of the Physics Department and Head of the Science Division. He received his BS from the Institute of Theoretical Physics, Martin Luther University, Germany in 1978 and a Ph.D. in Theoretical Physics from Northwestern University, USA in 1983. He has held research appointments at Argonne National Laboratory, Cornell National Supercomputer Center and Carnegie-Mellon University. His area of research has varied from many-particle-physics to amorphous silica, the constituent of optical fibers. His current work is in the area of Statistical Physics and involves computer simulation of complex anti-ferromagnetic systems. Other than research papers in the above areas, he has written in MacMillan Encyclopedia of Physics and published popular science articles for the general public. He has offered a hands-on workshop, "Super Science", for school children for the past ten years. Dr. Rahman is a member of the American Physical Society (APS) and the American Association of Physics Teachers (AAPT), and was elected member of Sigma Xi, the Scientific Research Society. In May, 2000, American Institute of Physics (AIP), the highest body of Physics in the USA, gave a press release on his research.

Session Chairs 25 January 2001

Session 1a	Time: 11:15am-12:45 pm	Place: Room 1600 Star Tower
Chair: Dr. Phalguni Gupta, Associate Professor, Department of Computer Science and Engineering, Indian Institute of Technology, Kanpur, India.		
Session 1b	Time: 11:15 am-12:45 pm	Place: Room 1102 Star Tower
Chair: Dr. Zafar Iqbal, Head, Department of Electronics and Computer Science, Shahjalal University of Science and Technology, Sylhet, Bangladesh		
Session 2a	Time: 2:30pm-4:00pm	Place: Room 1600 Star Tower
Chair: Prof. R.I. Sharif, Pro Vice Chancellor, Bangladesh Open University		
Session 2b	Time: 2:30pm-4:00pm	Place: Room 1102 Star Tower
Chair: Dr. M. Masroor Ali, Associate Professor, Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology		
Session 3	Time: 4:30 pm-5:30 pm	Place: Room 1600 Star Tower
Chair: Prof. Dr. SATOU Tadamasu, Department of Mathematics and Computer Science, Science and Engineering Faculty, Shimane University, 690-8504 Matsue-city Shimane Japan		
26 January 2001		
Session 4	Time: 9:30 am-11:00 am	Place: Room 1600 Star Tower
Chair: Dr. Shakil Ahmed, M.D. Process Driven Trading, Morgan Stanley Dean Witter, New York.		
Session 5	Time: 11:30 am-1:00 pm	Place: Room 1600 Star Tower
Chair: Prof. Lutfar Rahman, Department of Computer Science, University of Dhaka		
Session 6	Time: 3:30 pm-4:30 pm	Place: Room 1600 Star Tower
Chair: Dr. Abdul Mottalib, Professor, Department of Computer Science and Information Technology, Islamic Institute of Technology, Gazipur, Dhaka		