CURRICULUM VITAE

ALI   M. AL-HAJ
Professor of Computer Engineering
Princess Sumaya University for Technology
Amman, Jordan

1. <u>Personal Data</u>

- Date of Birth: Amman, 11 April 1963.
- Nationality: Jordanian.

2. <u>Education</u>

- Ph.D. (Electronics Engineering) 1993, Osaka University, Osaka, Japan.
- M.Sc. (Electronics Engineering) 1988, Tottori University, Tottori, Japan.
- B.Sc. (Electrical Engineering) 1985, Yarmouk University, Irbid, Jordan.

- Jordan General Secondary Education Certificate (92.8%), 1981, Jordan.
- High School Diploma, Solon High School, 1980, Solon, Ohio, USA.

3. <u>Ph.D. Dissertation</u>

- *"Neural Network Implementations on a Parallel Data Driven Computer"*. Osaka University, Osaka, Japan, June 1993.

4. <u>Employment</u>

Academic Positions

- *Professor*, Computer Engineering Department / Networks and Information Security Program, Princess Sumaya University for Technology, Amman, Jordan, July 19, 2017 – Present
- *Associate Professor*, Computer Engineering Department / Networks and Information Security Program, Princess Sumaya University for Technology, Amman, Jordan, Dec 28, 2005 – July 16, 2017
- *Assistant Professor*, Computer Engineering Department, Princess Sumaya University for Technology, Amman, Jordan, Sep. 15, 2000 – Dec. 27, 2005.
- *Assistant Professor*, Electronics Engineering Department , Princess Sumaya University for Technology, Amman, Jordan, Oct. 1, 1995 – Sep. 14, 2000.
- *Research Associate*, ATR Interpreting Telecommunication Research Laboratories, Kyoto , Japan, May 4, 1994 – May 10, 1995.
- *Research Associate*, College of Information Systems, Osaka University, Osaka, Japan, June 30, 1993 – April 10, 1994.

Administrative Positions

- *Chairman of the Electronics Engineering Department*, Faculty of Engineering, Princess Sumaya University for Technology, Amman, Jordan, from 15/ 09/ 1998 to 14/ 09/ 2001.
- *Chairman of the Computer Engineering Department*, Faculty of Engineering, Princess Sumaya University for Technology, Amman, Jordan, from19/ 03/ 2006 to 14/ 09/ 2006.
- *Chairman of the Computer Engineering Department*, Faculty of Engineering, Princess Sumaya University for Technology, Amman, Jordan, from 15/ 10/ 2008 to 14/ 09/ 2009.
- *Chairman of the Computer Engineering Department*, Faculty of Engineering, Princess Sumaya University for Technology, Amman, Jordan, from 22/ 09/ 2011 to 17/ 04/ 2014.

5. Establishment of Engineering Programs at PSUT

- Founding member of the Computer Engineering Program at PSUT, 2002.
- Founding member of Networks and Information Security Engineering Program at PSUT, 2014.
.

6. ABET Accreditation Responsibility

- Responsible for writing the Self Study Report for ABET Accreditation of the Computer Engineering Program at PSUT.
- Responsible for writing the Self Study Report for ABET Accreditation of the Networks and Information Security Engineering Program at PSUT.

7. Research Interests

- Information security and digital multimedia watermarking,
- Computer networks, cryptography and networks security
- VLSI digital signal processing, and intelligent computation.
- Dataflow computing and parallel information retrieval,

8. Membership in Scientific Societies and Associations

- IEEE.
- Jordan Engineers Association.
- Jordan Japan Academic Society (Vice President)
- Jordan Japan Cooperation Society (President)

9. Honors and Awards

- December 2008, *Hisham Hijjawi Award for Applied Research*, in the Communications and Information Technology sector. This annual award is a competitive and prestigious national award.

10. Fellowships and Scholarships

- July 2004 – Oct. 2004   DFG Fellowship – Germany
  Department of Computer Engineering,
  Mannheim University, Mannheim, Germany.

- June 1999 – Sep. 1999   Research Fellowship – Visiting Scholar
  Department of Electronics Engineering,
  National Chiao Tung University, Taiwan.

- June 1985 – June 1994   Graduate Research Scholarship - Japan
  MSc and PhD in Electronics Engineering
  Ministry of Higher Education, Japan.

11. Teaching Experience

- *Undergraduate Courses*
  - Cryptography
  - Fundamentals of Information Security
  - Information Security Management Systems
  - Computer Networks
  - Advanced Computer Networks
  - Networks Management and Security
  - Computer Architecture
  - Computer Organization
  - Digital Logic Design
  - Assembly Programming
  - Electric Circuits
  - Electronic Circuits
  - Instrumentations
  - Process Control

- *Graduate Courses*
  - Cryptography and Information Security
  - Selected Topics in Computer Engineering
  - Research Seminar
  - Theses Supervision

12. Supervision of Graduate Research

1. Islam Sahweesh, *An Efficient Security Mechanism for the Internet of Things Systems*, August 2019.
2. Najwa Odeh, *High A QoS-aware scheme over Fog Computing Infrastructures in the Internet of Things*, July 2019.
3. Jumanah Haimour, *An Adaptive Centralized Authentication Control Method to Reduce Authentication Delay in the IoT 802.11ah Protocol*, May 2019.
4. Muntaser Almoselli, *High Performance Hardware Implementation of Lightweight Cryptography Algorithms*, May 2019.
5. Mayyadah Adnan Abdulridha, *Online Security Protocols for NFC Mobile Payment Applications,* January 2017.
6. Nour Kittawi, *Reversible Data Hiding in Encrypted Images,* May 2016.
7. Hiba Abdel Nabi, *Providing Security to Transmitted Medical Images Using Cryptography and Reversible Watermarking*, May 2015.
8. Walaa Atoom, *Copyright Protection for Depth-Image-Based-Rendering (DIBR) 3D Images Using Watermarking Techniques*, May 2015.
9. Hussam I. Barouqa, *Protection of E-government Document Images Using Digital Watermarking*, January 2015.
10. Sumaya Abu Zaytoon, *Developing a Digital Watermarking Algorithm for E-government Document Images Using Discrete Wavelet Transform*, December, 2014.
11. Noor Hussein Haj Ali, *Exploring Encryption and Watermarking Techniques for Secure Telemedicine*, August 2013.
12. Ebtehal Omoush, *Arabic Keyword Extraction using Artificial Neural Networks-SOM*, August 2012.
13. Ashraf Odeh, *Relational Database Watermarking*, February 2009. (PhD)
14. Ayman Abu-Errub, *Optimized Digital Image Watermarking*, February 2009. (PhD)

13. Grants

- Watermarking of Relational Database Systems, Higher Council for Science and Technology, Amman, Jordan, 2010. The project was funded by the Higher Council with 15,000 JD.

14. Patents

- Parallel Information Retrieval, ATR Interpreting Telecommunication Research Laboratories, Kyoto , Japan, 1995.

15. Committees

- Member of the Assessment committee of the Faculty of Engineering
- Co-founder and member of the Steering Committee of the *National Technology Parade* from 2006 until 2012.
- Frequent membership of Master Theses Evaluation Committees at national universities in Jordan.

16. Professional and Scientific Meetings

- Organizer and head of the steering committee of the *2ⁿᵈ National Technology Parade* held at PSUT in 2008.
- Organizer and chairman of *Cisco Networking Academy Regional Events* held at PSUT in the years 2008, 2009, and 2012.

17. Participation in or organization of curricular and/or extra-curricular activities

- Participation in more than 30 scientific international conferences in different countries to present research results.
- Co-organizer and Chairman of several *Cisco Networking Academy Regional* workshops held at PSUT in the years 2008, 2009, and 2012.
- Vice president of Jordan Japan Academic Society.
- President of Jordan Japan Cooperation Society.
- Co-founder of Cisco Networking Academy at PSUT since 2004.
- Director of Cisco Academy Training and Support Center at PSUT from 2004 to 2014.
- Participation in the *World Leaders Forum* in Taipei Taiwan in 2010, on behalf of HRH Princess Sumaya Bint ElHassan.

18. Publications

▪ Books & Book Chapters

[1]. Ali Al-Haj (Editor) *Advanced Techniques in Multimedia Watermarking: Image, Video and Audio Applications*, IGI Global, USA, April 2010.

[2]. Ali Al-Haj, et al. "A Unified Approach Towards Multimedia Watermarking", Book Chapter in *Advanced Techniques in Multimedia Watermarking: Image, Video and Audio Applications, (Ed.) Ali M. Al-Haj*, IGI Global, USA, pp. 228-253, 2010.

[3]. Ali Al-Haj, "Image Watermarking Algorithms Based on the Discrete Wavelets Transform", Book Chapter in *Multimedia Transcoding in Mobile and Wireless Networks, (Eds.) Ashraf Ahmad and Ismail Ibrahim*, IGI Global, USA, pp. 365-392, 2008.

▪ Journals

[1]. Wala Etoom and **Ali Al-Haj**, "A robust and imperceptible watermarking method for 3D DIBR images", *Multimedia Tools and Applications*, 81:28165–28182, DOI: https://doi.org/10.1007/s11042-022-12553-4, August 2022.

[2]. Nour Kittawi and **Ali Al-Haj**, "Reversible data hiding using bit flipping and histogram shifting", *Multimedia Tools and Applications*, 81, 12441–12458, DOI: https://doi.org/10.1007/s11042-022-12364-7, April 2022.

[3]. Islam Alshawish and **Ali Al-Haj**, "An efficient mutual authentication scheme for IoT systems", *The Journal of Supercomputing*, DOI: https://doi.org/10.1007/s11227-022-04520-5, April 2022.

[4]. **Ali Al-Haj** and Heba Abdel Nabi, "An efficient watermarking algorithm for medical images", *Multimedia Tools and Applications*, DOI: 10.1007/s11042-021-10801-7, April 2021.

[5]. Heba Abdel Nabi and **Ali Al-Haj**, "Reversible data hiding in adjacent zeros," *Multimedia Systems*, 27, pp. 229–245, January 2021.

[6]. Ahmad Mohammad, Ali Al-Haj, and Mahmoud E. Farfoura, "An improved capacity data hiding technique based on image interpolation", *Multimedia Tools and Applications*, 78(6), pp. 7181–7205, March 2019.

[7]. Ali Al-Haj, Mahmoud E. Farfoura, and Ahmad Mohammad, "Transform-based watermarking of 3D depth-image-based-rendering images", *Measurement*, vol. 95, pp. 405-417, January 2017.

[8]. Ali Al-Haj, Ahmad Mohammad , and Alaa Amer "Crypto-Watermarking of Transmitted Medical Images", *Journal of Digital Imaging*, 30(1), pp. 26-38, February 2017.

[9]. **Ali Al-Haj**, Gheith Abandah, and Noor Hussein, "Crypto-based algorithms for secured medical image transmission", *IET Information Security*, 9(6), pp. 365-373, Nov. 2015.

[10]. Mahmoud Farfoura, Shi-Jinn Horng, Jing-Ming Guo, and **Ali Al-Haj**, "Low complexity semi-fragile watermarking scheme for H.264/AVC authentication", *Multimedia Tools and Applications*, 75(13), pp. 7465–7493, July 2016.

[11]. Lama Rajab, Tahani Al-Khatib, and **Ali Al-Haj**, "A Blind DWT-SCHUR Based Digital Video Watermarking Technique", *Journal of Software Engineering and Applications,* 2015(8), pp. 224-233, 2015.

[12]. **Ali Al-Haj**, "Providing Integrity, Authenticity, and Confidentiality for Header and Pixel Data of DICOM Images", *Journal of Digital Imaging*, 8(3), pp. 179-187, 2015.

[13]. **Ali Al-Haj**, "A dual transform audio watermarking algorithm", *Multimedia Tools and Applications*, 8(3), pp. 1897-1912, 2014.

[14]. **Ali Al-Haj**, "An Imperceptible and Robust Audio Watermarking Algorithm", *EURASIP Journal on Audio, Speech, & Music Processing*, October 2014, pp. 1-12, DOI :10.1186/s13636-014-0037-2.

[15]. **Ali Al-Haj** and Alaa Amer, "Secured Telemedicine Using Region-Based Watermarking with Tamper Localization", *Journal of Digital Imaging*, 8(3), pp. 737-750, 2014.

[16]. **Ali Al-Haj,** Ahmad Mohammad, and Lama Bata, "DWT-Based Audio Watermarking", *International Arab Journal of Information Technology*, 8(3), pp. 326-333, 2011.

[17]. **Ali Al-Haj** and Ahmad Mohammad "Digital Audio Watermarking Based on the Discrete Wavelets Transform and Singular Value Decomposition", *European Journal of Scientific Research*, 39(1), pp. 6-21, 2010.

[18]. **Ali Al-Haj** and Tuqa Manasrah, "SVD-Based Image Watermarking", *Journal of Digital Information Management*, 7(2), pp. 83-89, April. 2009.

[19]. Lama Rajab, Tahani Al-Khatib, and **Ali Al-Haj**, "Video Watermarking Algorithms Using the SVD Transform", *European Journal of Scientific Research*, 30(3), pp. 389-401, 2009.

[20]. Ahmad Mohammad, **Ali Al-Haj**, and Samir Shaltaf, " An Improved SVD-based Watermarking Scheme for Protecting Rightful Ownership", *Signal Processing*, 88(9), pp. 2158-2180, Sep. 2008.

[21]. **Ali Al-Haj**, and Ashraf Odeh, "Robust and Blind Watermarking of Releational Database Systems", *Journal of Computer Science*, 4(12), pp. 1024-1029, 2008.

[22]. Tahani Al-Khatib, **Ali Al-Haj**, Lama Rajab, and Hiba Mohammed, "A Robust Video Watermarking Algorithm", *Journal of Computer Science*, 4(11), pp. 910-915, 2008.

[23]. Ali Al-Haj and Ayman Abu-Errub "Performance Optimization of Discrete Wavelets Transform Based Image Watermarking Using Genetic Algorithms", *Journal of Computer Science*, 4(10), pp. 826-833, 2008.

[24]. Ali Al-Haj, "Configurable Multirate Filter Banks", American Journal of Applied Sciences, 5(7), pp. 788-797, 2008.

[25]. Ali Al-Haj, "Combined DWT-DCT Digital Image Watermarking", Journal of Computer Science, 3(9), pp. 740-746, 2007.

[26]. Ali Al-Haj, "FPGA-Based Implementation of Quadrature Mirror Filter Banks", *International Journal of Computers and Applications*", 14(4), pp. 242-249, 2007.

[27]. Ali Al-Haj, "A Parallel FPGA-Based Implementation of the Discrete Wavelet Transform", *Australian Journal for Intelligent Information Processing Systems,* 8(4), pp. 215-220, 2006.

[28]. Ali M. Al-Haj, "FPGA-Based Data Coding", in *WSEAS Transactions on Computers,* Vol. 4, No. 2, pp. 253-257, February 2005.

[29]. Ali Al-Haj, "On Accelerating the Neighbours Lists Generation Process Using Field Programmable Gate Arrays", in *WSEAS Transactions on Computers,* Vol. 4, No. 2, pp. 258-262, February 2005.

[30]. Ali Al-Haj, "An FPGA-Based Parallel Distributed Arithmetic Implementation of the 1-D Discrete Wavelet Transform", in *Informatica : An International Journal of Computing and Informatics ,* Vol. 32, No. 2, pp. 241-247, 2005.

[31]. Ali Al-Haj, "A Distributed Arithmetic & Polyphase Decomposition FPGA Implementation of the Discrete Wavelet Transform", in *International Journal of Computer Research,* Vol. 12, No. 4, 2004.

[32]. Ali Al-Haj, "Pipelining The One-Dimensional Discrete Wavelet Transform On Field Programmable Logic Devices", in *Journal of Institute of Mathematics & Computer Sciences (Computer Science Series),* Vol. 15, No. 1, pp. 1-15, 2004.

[33]. Ali Al-Haj, "Fast Discrete Wavelet Transformation Using FPGAs and Distributed Arithmetic", in *International Journal of Applied Science and Engineering,* Vol. 1, No. 2, pp. 160-171, 2003.

[34]. Ali Al-Haj, "Parallel Text Retrieval," in *Journal of Mu'tah University, Jordan*, Vol. 15, No. 4, pp. 71-91, 2000.

[35]. Ali Al-Haj, Eichiro Sumita and Hitoshi Iida, " Massively Parallel Text Retrieval," *Technical Report*, ATR Interpreting Telecommunications Research Laboratories, Kyoto, Japan, May 1995.

[36]. Ali Al-Haj and Hiroaki Terada, " Parallel Implementations of Back Propagation Networks on a Dynamic Data-Driven Multiprocessor," in *IEICE Transactions on Information and Systems*, Vol. E77-D, No. 5, pp. 579-588, May 1994.

[37]. Ali Al-Haj and Hiroaki Terada, " Exploiting Parallelism in Neural Networks on Networks on a Dynamic Data-Driven System," in *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Science*, Vol. E76-A, No. 10, pp. 1804-1811, October 1993.

- **International Conferences**

[1]. Lina Ahmad, Rania Al-Sabha, and **Ali Al-Haj**, "Design and Implementation of a Secure QR Payment System Based on Visual Cryptography," in *Proc. of the 7th IEEE International Conference on Information Management,* UK, March 2021.

[2]. Yazan Salman and **Ali Al-Haj**, "Copyright Protection of 3D Images Using Digital Watermarking," in *Proc. of the IEEE 7th International Conference on Information Management*, UK, March 2021.

[3]. Hussan Barouqa and **Ali Al-Haj**, "Watermarking E-Government Document Images Using the Discrete Wavelets Transform and Schur Decomposition," in *Proc. of the IEEE 7rd International Conference on Information Management*, UK, March 2021.

[4]. Ali Al-Haj and Mahmoud Farfoura, "Providing Security for E-Government Document Images Using Digital Watermarking in the Frequency Domain," in *Proc. of the 5th IEEE International Conference on Information Management,* UK, March 2019.

[5]. Ali Al-Haj and Mayyadah Adnan Al-Tameemi, "Providing security for NFC-based payment systems using a management authentication server," in *Proc. of the IEEE 4th International Conference on Information Management*, UK, May 2018.

[6]. Ali Al-Haj and Hussan Barouqa, "Copyright protection of e-government document images using digital watermarking," in *Proc. of the IEEE 3rd International Conference on Information Management*, UK, May 2017.

[7]. Ali Al-Haj and Hiba Abdel-Nabi, "Digital image security based on data hiding and cryptography," in *Proc. of the IEEE 3rd International Conference on Information Management*, UK, May 2017.

[8]. Mayada Al-Tamimi and **Ali Al-Haj**, "Online security protocol for NFC mobile payment applications," in *Proc. of the IEEE 8th International Conference on Information Technology (ICIT),* Jordan, May 2017.

[9]. Nour Kittawi and **Ali Al-Haj**, "Reversible data hiding in encrypted images," in *Proc. of the IEEE 8th International Conference on Information Technology (ICIT),* Jordan, May 2017.

[10]. Wala Etoom and **Ali Al-Haj**, "Frequency-domain watermarking of 3D DIBR images using the steerable pyramid and discrete cosine transforms," in *Proc. of the IEEE 8th International Conference on Information Technology (ICIT),* Jordan, May 2017.

[11]. Hiba Abdel-Nabi and **Ali Al-Haj**, "Medical imaging security using partial encryption and histogram shifting watermarking," in *Proc. of the IEEE 8th International Conference on Information Technology (ICIT),* Jordan, May 2017.

[12]. Hiba Abdel-Nabi and **Ali Al-Haj**, "Efficient joint encryption and data hiding algorithm for medical images security," in *Proc. of the IEEE 8th International Conference on Information and Communication Systems (ICICS),* Jordan, April 2017.

[13]. Ali Al-Haj, Noor Hussein, and Gheith Abandah "Combining Cryptography and digital watermarking for secured transmission of Medical images," in *Proc. of the IEEE International Conference on Information Management,* UK, May 2016.

[14]. Ali Al-Haj, Christina Twal and Ahmad Mohammad, "Hybrid DWT-SVD Audio Watermarking," in Proc. of *the IEEE International Conference on Digital Information Management*, Vol. 1, pp. 448-453, Canada, August 2010.

[15]. Ali Al-Haj, Ashraf Odeh, and Shadi Masadeh "Copyright Protection of Relational Database Systems," in Proc. of *the Springer International Conference on Networked Digital Technologies*, Czech Republic, July 2010.

[16]. Ali Al-Haj, Lama Bata, and Ahmad Mohammad "Audio Watermarking Using Wavelets," in Proc. of *the IEEE International Conference on Networked Digital Technologies*, Czech Republic, July 2009.

[17]. Ali Al-Haj, "Wavelets Pre-Processing of Artificial Neural Networks Classifiers," in Proc. of *The fifth IEEE International Multi-Conference on System, Signal and Devices*, Amman, Jordan, July 2008.

[18]. Ali Al-Haj, "An Efficient Configurable Hardware Implementation of Fundamental Multirate Filter Banks," in Proc. of *The fiifth IEEE International Multi-Conference on System, Signal and Devices*, Amman, Jordan, July 2008.

[19]. Majid Al-taee, M. Souan, **Ali Al-Haj**, A. Mohsen; Z. Muhsin, "Quality Control information system for immunology/ serology tests in medical laboratories," in Proc. of *The fiifth IEEE International Multi-Conference on System, Signal and Devices*, Amman, Jordan, July 2008.

[20]. Ali Al-Haj and Rasha Kasrawi" Automating Engineering Education in Jordan: A Case Study," in Proc. *3rd International Conference on Interactive Mobile and Computer aided Learning*, Amman, Jordan, April 2008.

[21]. Ashraf Odeh and **Ali Al-Haj**, "Watermarking Relational Database Systems," in Proc. of *the IEEE International Conference on Application of Digital Information and Web Technologies*, Vol. 1, pp. 270-274, Czech Republic, Aug. 2008.

[22]. Ayman Abu-Errub and **Ali Al-Haj**, "Optimized DWT-Based Image Watermarking," in Proc. of *the IEEE International Conference on Application of Digital Information and Web Technologies* Vol. 1, pp. 532-537, Czech Rep, Aug. 2008.

[23]. Tuqa Manasrah and **Ali Al-Haj**, "Management of Medical Images Using Wavelets-Based Multi-Watermarking Algorithm," in Proc. of *the IEEE International Conference on Technology Innovations*, UAE, Dec. 2008.

[24]. Lama Rajab, Tahani Al-Khatib, and **Ali Al-Haj**, "Hybrid DWT-SVD Video Watermarking Algorithm," in Proc. of *the IEEE International Conference on Technology Innovations*, UAE, Dec. 2008.

[25]. Ali Al-Haj and Tuqa Manasrah, " Non-invertible copyright protection of digital image using DWT and SVD," in Proc. of *the IEEE International Conference on Digital Information Management*, Vol. 1, pp. 448-453, France, Oct. 2007.

[26]. Ali Al-Haj, "A Hybrid digital image watermarking algorithm," in Proc. of *the IEEE International Conference on Technology Innovations*, Vol. 1, pp. 448-453, UAE, Nov. 2007.

[27]. Ali Al-Haj, "FPGA-Based Quadrature Mirror Filters for DSP Application ," in Proc. of *the IEEE International Conference on Signal-Image Technology and Internet-Based Systems*, Vol. 1, pp. 581-584, Shanghai, China, 2007.

[28]. Ali Al-Haj , "A Parallel Distributed Arithmetic Implementation of the Discrete Wavelet Transform", in Proc. Of *the WSEAS Third International Conference on Wavelets and Multirate Systems*, Greece, 2003

[29]. Ali Al-Haj, "Exploiting Parallelism in Relevance Feedback Information Retrieval," in Proc. Of the *1998 International Technical Conference on Circuits/Systems, Computers and Communication*s, Sokocho, Korea, July 1998.

[30]. Ali Al-Haj, "A MIMD Text Retrieval System," in Proc. Of the *1998 International Technical Conference on Circuits/Systems, Computers and Communication*s, Sokocho, Korea, July 1998.

[31]. Ali Al-Haj, " A Parallel Text Retrieval System," in Proc. of the *third International Workshop on Parallel Processing for Artificial Intelligence, IJCAII-95*, Canada, August 1995.

[32]. Ali Al-Haj, " An Efficient Implementation of the Back Propagation on a Tagged-Token Data-Driven Multiprocessor," in Proc. of the *1993 Joint Technical Conference on Circuits/Systems, Computers and Communications,* Nara, Japan, July 1993.

[33]. Ali Al-Haj, " A Data-Driven Implementation of the Back Propagation Algorithm," in Proc. of *the IEEE International Joint Conference on Neural Networks*, Baltimore, USA, June 1992.

[34]. Ali Al-Haj, "A Data-Driven Neurocomputer," in Proc. of the *IEEE International Joint Conference on Neural Networks*, Beijing, China, November 1992.