A Brief Introduction to

School of Telecommunication Engineering

Xidian University

Hailin zhang

Xidian University

- Established in 1931.
- Sponsored by China's “211 National Higher Education Development project”.
- Belongs to the Education Ministry of China
- Dedicated primarily to electronics and information science and technology

Xidian University

- National Key Disciplines
  - Communication and Information System
  - Signal and Information Processing
  - Cryptology
  - Electromagnetic fields and Microwave Technology
  - Circuit and System
  - Microelectronics and Solid Electronics

Xidian University

- National Teaching and Training Base
  - National Teaching Base of Information and Communication.
  - National Teaching Base of Electronics and Electricity.
  - National Training Base of Integrated Circuit.

Xidian University

- National Academic Exchanging Base
  - National 111 Base on Modern Wireless Information Networks .
  - National 111 Base on Intelligent signal And Information processing

Xidian University

- National key laboratories
  - National Key Lab. on Integrated Services Networks. (ISN-Lab.)
  - National Key Lab. on Radar Signal Processing
  - National Key Lab. on Antennas and Microwave Technology

Xidian University

- **12 Schools**
  - School of Telecommunication Engineering
  - School of Electronic Engineering
  - School of Computer Science and Technology
  - School of Mechanic-Electronic Engineering
  - School of Microelectronics
  - School of Technical Physics
  - School of Science
  - School of Economy and Management
  - School of Humanities & Arts
  - Software School
  - School Network Education of Continuing Education
  - Graduate School

School of Telecommunication Engineering

- One of the oldest, most featured and rapidly developing schools within Xidian University.
- Dedicated to the research and education in the areas of Information and Communications, covered 7 disciplines.
- Houses 3 teaching departments, 2 national base, 3 key laboratories, 4 institutes, and 1 station for postdoctoral scholars.

School of Telecommunication Engineering

- Departments：
  - Department of Communication Engineering
  - Department of Information Engineering
  - Department of Electronics Technology

School of Telecommunication Engineering

- National Base：
  - National 111 Base of innovation and Talents-Introducing of Discipline on Modern Wireless Information Networks .
  - National Teaching Base of Information and Communication Engineering.

School of Telecommunication Engineering

- Key Laboratories：
  - National Key Lab. on Integrated Services Networks
  - Key Lab. on Computer Networks and Information Security

    (Ministry of Education)
  - Key Lab. on Wireless Communication (Ministry of Information Industry)

School of Telecommunication Engineering

- **Research Institutes：**
  - Institute of Information Science
  - Institute of Information Secrecy
  - Dedicated Communication
  - Image Transmission and Processing

School of Telecommunication Engineering

- **The Faculty and Students：**
  - Ph.D. Advisors ： 19
  - Professors： 36
  - Associate Professors： 66
  - Total faculty: 240
  - Ph. D candidates： 246
  - Master candidates： 1563
  - Bachelor candidates： 3500

School of Telecommunication Engineering

- Disciplines for Graduate Students
  - Information and Communication Engineering (Rank second in China）
    - Communication and Information System (National key discipline)
    - Cryptology（ National key discipline）
    - Military Communication （Ministry key discipline）
    - Traffic Information Engineering and Control
    - Information Security
    - Optical Communication
    - Space Information Science and Technology

School of Telecommunication Engineering

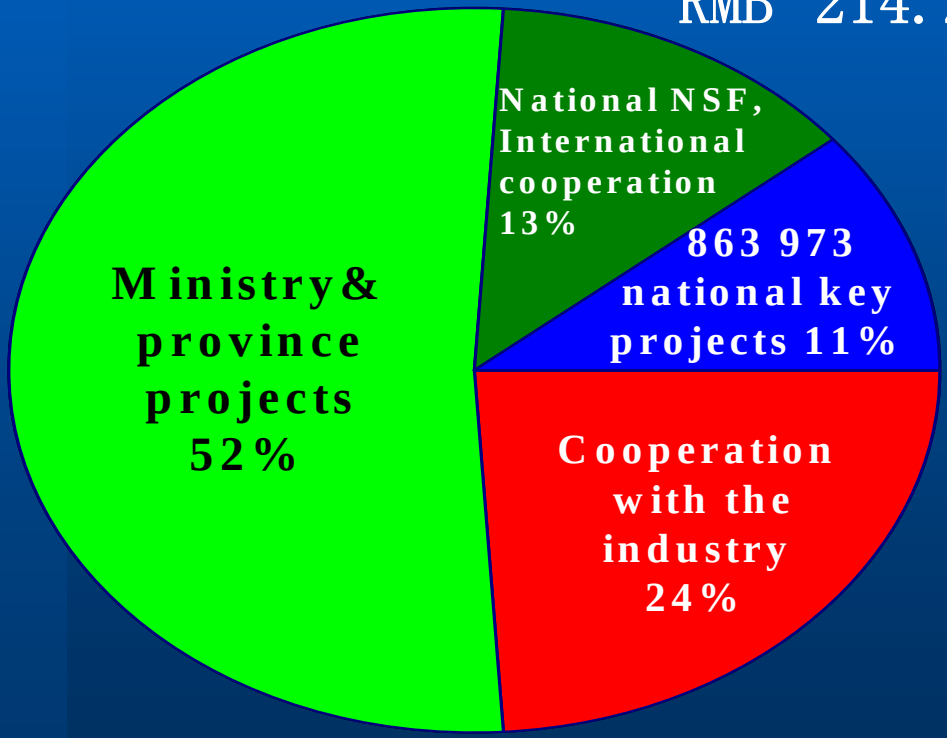
- Specialties for undergraduate students

  – Communication Engineering
  （Ranked first in China）
  – Electronics Information Engineering
  （ Ranked top in province ）
  – Information Security
  (Ranked top in China)

School of Telecommunication Engineering

- Research Fund(2004-2008):

RMB 214.24 million Yuan.



School of Telecommunication Engineering

- Research Achievements(1999-2008)
  - National Technology Progress Award: 3
  - Ministerial(Provincial) Technology Award: 46
  - 3 “Chang-Jiang ” Scholarship
  - 112 papers issued in international periodicals
  - Papers index by SCI(291), EI(1233)
  - Books：35
  - Patents：46

School of Telecommunication Engineering

- Research Directions
  - Modern Wireless Communication
  - Communication Networks
  - Information Coding and Transmission
  - Information and Network Security

Modern Wireless Communication

- Recent Research Focus:
  - *MIMO-OFDM Techniques and Its Applications in IMT-Advanced System.*
  - *Cognitive Radio and Large scale Ad Hoc network.*
  - *Cooperative Wireless Mesh Network*
  - *Network Coding*
  - *Quantum Cryptogram and Communication*
  - *Adaptive Meteor-Trace Based Communication System.*
  - *Near Space and Deep Space Communication Techniques*

WELCOME TO OUR SCHOOL!

- Congratulate for the Success of "UK-China Science Bridges" Project !
- We are ready and confident to further collaboration !

WELCOME TO OUR SCHOOL!

Modern Wireless Communication

- Current Projects
  - The interconnection of wireless mobile ad hoc networks and its test bed system,
    863 important project 01-03
  - Large scale broadband wireless adaptive ad hoc network, National NSF project 04-06
  - Broadband distributed ad hoc mobile wireless IP network technology,
    Key project of Education Ministry 01-04
  - South pole Meteor Communication,
    In cooperation with Shizuoka University(Japan) 00-05

Modern Wireless Communication

- Current Projects
  - Mobile ad hoc network technology 01-05
  - Key technology of software radio 01-05
  - Super high-speed spread-spectrum and networking technology 01-05
  - Channel technology 01-05
  - Meteor adaptive data transmission and networking protocol 01-05
  - Anti-multipath techniques for meteor burst communication 01-05
  - Satellite overlay communication technology 01-05
  - Anti-jam techniques for satellite payload 01-05

Modern Wireless Communication

- Recent Research Achievements ：
  - Sponsored by national 863 high-tech important project and national NSF, we implemented a broadband wireless IP network, which supports mobile IP and services like VOD, WWW and FTP etc.
  - The technology is included into the high-tech industrialization project of National Planning Committee. IWNCOMM CO., LTD was established to industrialize the technology.

Modern Wireless Communication

Products certificated by CCCi:

- Broadband wireless access point
- Wireless network card
- Authentication server

Modern Wireless Communication

Two national standards on wireless LAN:

GB 15629.11-2003

GB 15629.1102-2003

ICS 35.110
L 78

GB

中华人民共和国国家标准

GB 15629.11—2003

信息技术　系统间远程通信和信息交换
局域网和城域网　特定要求　第 11 部分：
无线局域网媒体访问控制和物理层规范

Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications

(ISO/IEC 8802-11:1999,MOD)

2003-05-12 发布　　2003-12-01 实施

中华人民共和国
国家质量监督检验检疫总局　发布

Modern Wireless Communication


中华人民共和国信息产业部

信息产业重大技术发明

荣誉证书

为表彰在信息产业领域技术创新与发明创造中做出的重大贡献，特颁发此证书，以资鼓励。

项目名称：宽带无线IP网络安全技术 WAPI

完成单位：西安西电捷通无线网络通信有限公司

证书编号：0305014

日　　期：二〇〇三年十一月二十一日

WAPI(Wireless LAN Authentication and Privacy Infrastructure), proposed by IWNCOMM, is part of the national standard. WAPI has been assigned Ethernet type 0x88b4 by relative international authority. WAPI has caused significant influence on wireless LAN market， and wined 2003 China Information Technology Invention Award.

Modern Wireless Communication

Broadband ad hoc network router and its main-board

Modern Wireless Communication

TBR-134 shortwave single side-band adaptive frequency hopping radio station got National Science and Technology Progress Award (third class)

Frequency Hopping Encryption Chip， Patent No. : 00130524.7，Issued：2003.3.4

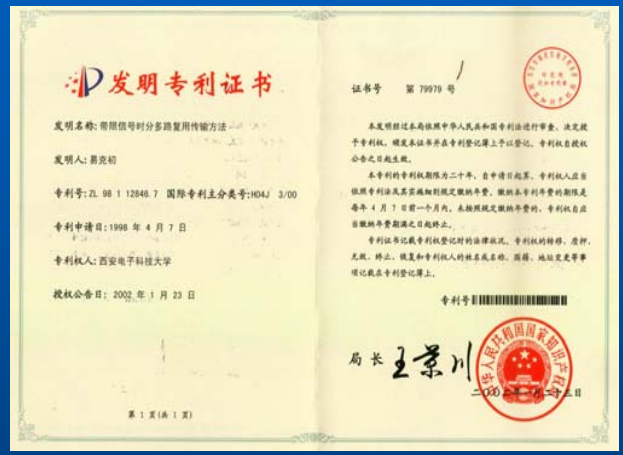
Modern Wireless Communication

Shortwave multifunction communication controller, which includes functions like: shortwave serial modem, aviation shortwave TDMA modem, wireless burst transmission, wireless data transmission under worst condition, self-adaptation(2G,3G), frequency hopping, and wireless channel simulator etc.

Modern Wireless Communication

Shortwave automatic frequency selection communication system. Based on available shortwave radio station, the system can automatically select and assign the best working frequency from the full frequency band in real-time. Both voice and data transmissions are supported.

Modern Wireless Communication


发明专利证书

发明名称：带限信号时分多路复用传输方法

发明人：易克初

专利号：ZL 98 1 12846.7 国际专利主分类号：H04J 3/00

专利申请日：1998 年 4 月 7 日

专利权人：西安电子科技大学

授权公告日：2002 年 1 月 23 日

第 1 页（共 1 页）

证书号 第 79979 号

本发明经过本局依照中华人民共和国专利法进行审查，决定授予专利权，颁发本证书并在专利登记簿上予以登记。专利权自授权公告之日起生效。

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专利号

局长 王景川

二〇〇二年一月二十三日

“A TDM transmission method for band limited signal ” , which is a patent issued in the year 2002, is applied in developing a satellite communication system.

Modern Wireless Communication

- Recent papers:
  - A novel family of frequency hopping sequences for multi-hop bluetooth networks， Zan Li, Yilin Chang, **IEEE Transactions On Consumer Electronics,** 2003, vol.49, No.4, Nov.
  - MAC protocol for mobile Ad Hoc network with smart antennas, Jun Yang, Jiandong Li, Min Sheng,

    IEE Electronics Letters, 2003.Vol39. No.6
  - Routing Protocol With QoS Guarantees for Ad Hoc Network, Min Sheng, Jiandong LiYan Shi,

    IEE Electronics Letters, 2003.Vol 39.No.1

Modern Wireless Communication

- Recent papers:
  - Performance Evaluation of Modified IEEE 802.11 MAC for Multi-channel Multi-hop ad hoc networks, Jiandong Li， Zygmunt J. Haas， Min Sheng， Yanhui Chen，

    Journal of Interconnection Networks, 2003.Vol.4,No.3
  - M-PCF: Modified IEEE 802.11 PCF Protocol Implementing QoS, LiQiang Zhao, ChangXin Fan,

    IEE Electonics Letters, 2002,Vol.38,No.24

Modern Wireless Communication

LI Jiandong

YI Kechu

YANG Jiawei

JIN Lijun

ZHANG Hui

CHEN Yanhui

Communication Networks

- Research Focus

Broadband switching and integrated access, network management, Internet congestion control, intelligent optical network and optical burst switching etc.

Techniques to improve the performance, reliability and survivability of the network, to offer adequate QoS to network users.

Communication Networks

- Current projects:
  - A new label switching architecture

    863 project 02-04
  - Terabit router switching network technology

    863 project 02-04
  - Topology discovery and performance analysis of IP network based on network probing

    National NSF key project 02-04
  - The Internet congestion control mechanism

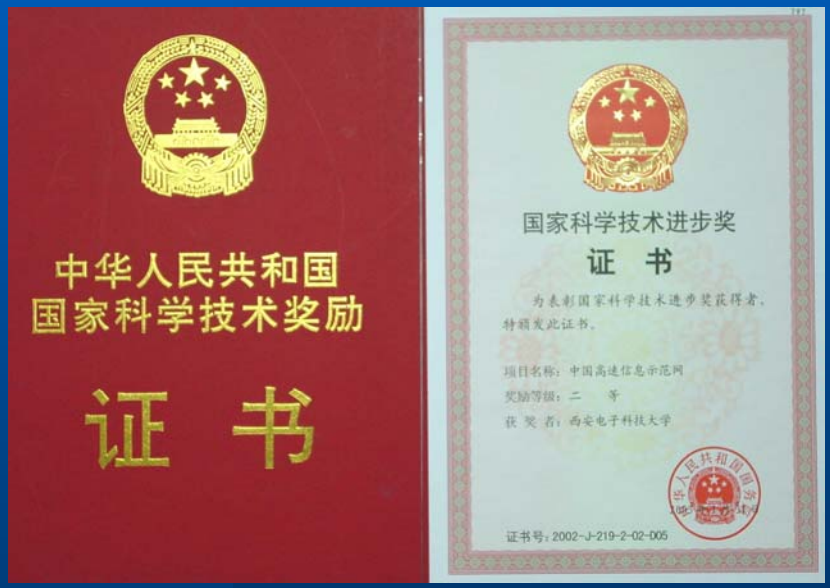
    National NSF important program 02-04

Communication Networks

- Current projects:
  - Broadband integrated access system 01-05
  - Multimedia cooperated work system 01-05
  - Integrated network management 01-05
  - Distributed network management system evaluation 01-05
  - Routing policy of Next Generation Network 03-04
  - Real-time service performance of MSR protocol 03-04
  - Large capacity variable length packet switching 02-04
  - LMP protocol software of ION 03-04
  - Abstract agent technology 01-05
  - Implementation of a distributed network management system 01-05

Communication Networks

- Recent Research Achievements ：



Participated in 863 important project “China high-speed demonstration information network” , which represents the technical ability of china’s new generation backbone network. Wined National Science and Technology Progress Award(second class) 。

Communication Networks

5Gbps ATM Switch. 5Gbps throughput，support 2 type of ATM interface(622Mbps and 155Mbps)，UNI interface，and various other interfaces(10/100Mbps Ethernet, E1 circuit emulation and V.35 interface)。

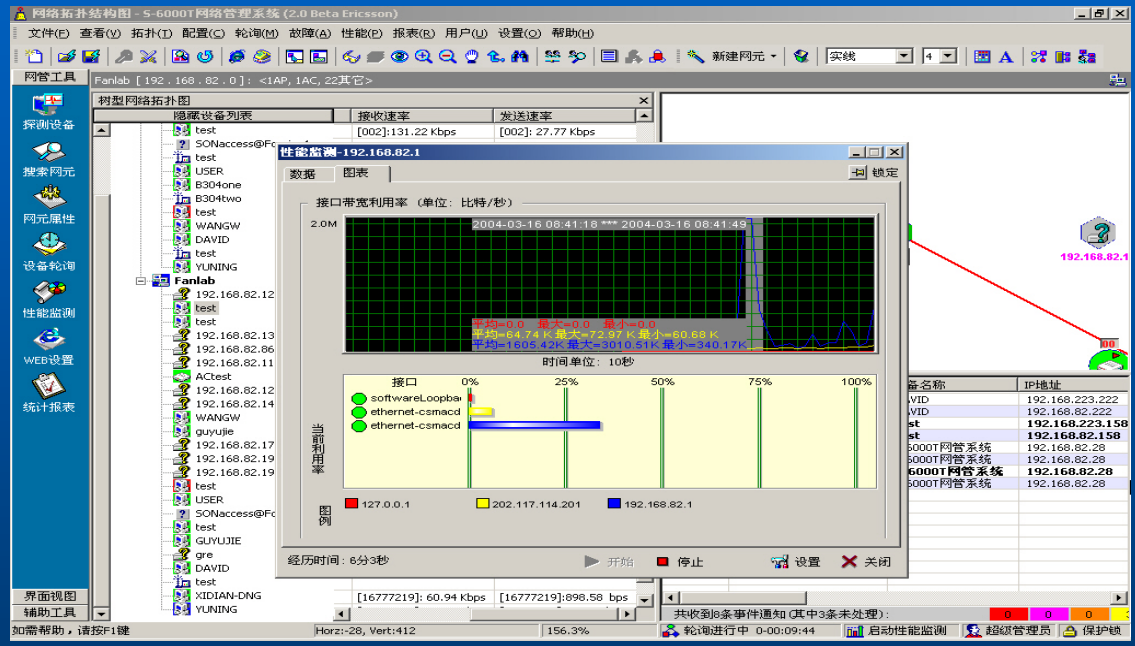
Communication Networks

Integrated services access system. UNI interface includes 4 fiber(155.52Mbps each), support voice, video and Ethernet data services.

Communication Networks

High performance Ethernet switch. 24 ports(10/100Base-T), support network management, VLAN and flow control(IEEE 802.1p)。

Communication Networks



Wireless LAN network management system is adopted by Guangdong Mobile, Beijing Mobile and Shanghai Mobile.

Communication Networks

- Recent papers:
  - On Evil-Twin Routing in Clos Networks， Chen, Z.; Liu, Z.-J.; Qiu, Z.-L.; Tao, X.-M，**IEEE Communications Letters**，2004，Vol.8, No.5
  - Bidirectional Shuffle-Exchange Network and Tag-Based Routing Algorithm，Z chen，Z.-J. Liu，Z.-L. Qiu **IEEE Communications Letters**, 2003,Vol.7,No.3
  - Dynamic Routing and Wavelength Assignment for Limited-Range Wavelength Conversion，H.Qin, S.Zhang, Z.Liu, **IEEE Communications Letters**, 2003.Vol.7, No.3

Communication Networks

- Recent papers:
  - Design of an On-Demand Traffic Converger， H You, Z Liu, Z Qiu，
    IEEE Communications Letters， 2002,Vol.6,No.4
  - Routing and Wavelength Assignment Based on Genetic Algorithm， H Qin, Z j Liu, S Zhang and A j Wen
    IEEE Communications Letters， 2002,Vol.6,No.10

Communication Networks


LIU Zengji PEI Changxing





QIU Zhiliang XU Zhanqi WU Yuhong WEN Aijun ZHANG Bing

Information Coding and Transmission

- Research Focus
  - Image(video) transmission and process
  - Channel coding techniques, like Turbo code, space-time code etc.
  - New type of high efficiency transmission techniques, like COFDM, MC-CDMA.
  - Wireless multi-path high-speed modem
  - HDTV transmission technology

Information Coding and Transmission

- Current projects:
  - TURBO process method of communication signal
    National NSF 02-04
  - Anti-error techniques for the third/fourth generation wireless video communication, National NSF 02-04
  - Broadband COFDM modem techniques
    National NSF (Important program) 02-04
  - Concatenated space-time code of mobile communication system. National NSF 02-04

Information Coding and Transmission

- Current projects:
  - Multiple description mesh based video coding, National NSF 02-04
  - Low density check coding based on graph model, National NSF 03-05
  - Source and channel joint coding based on MPEG-4, National NSF 04-06
  - High-speed TCM codec techniques 01-05
  - Aviation signal coding scheme for the new generation satellite navigation and positioning system. 01-05
  - Variable bit rate source coding techniques 01-05
  - High resolution and compressing rate data compression techniques 01-05
  - High efficiency data compression methods and evalution 01-05
  - Scene generator 01-05

Information Coding and Transmission

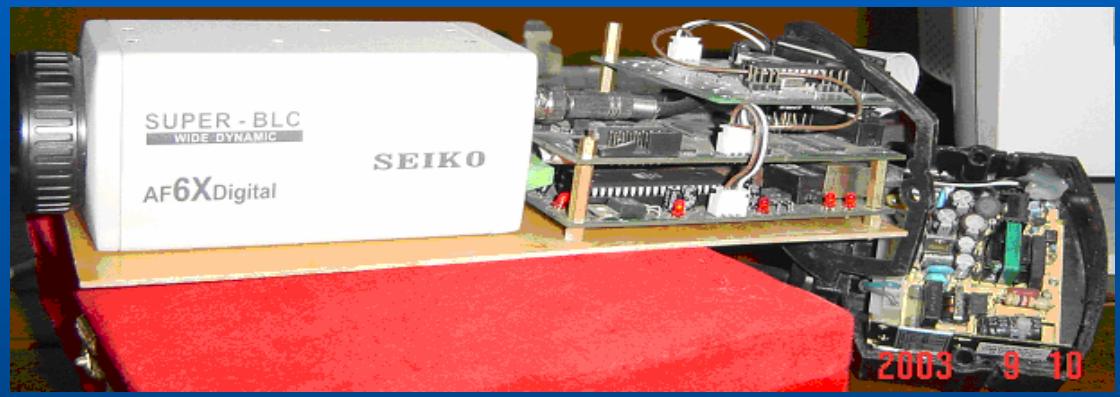
- Recent Research Achievements ：

Sponsored by National Planning Commission important project, we developed China's first set of COFDM transmission system for HTDV broadcasting. This system was used to broadcast 50th national day celebration in real-time. Wined National Science and Technology Progress Award(second class) in 2003.

Information Coding and Transmission

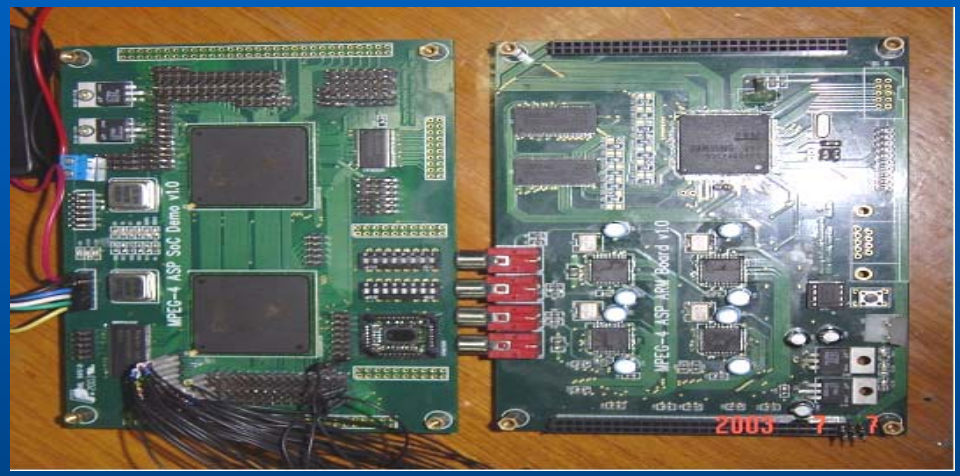
China’s first real-time satellite image eight time compression codec system， which participated in the 863 fifteen years achievements exhibition. Wined 863 excellence research group award.

Information Coding and Transmission



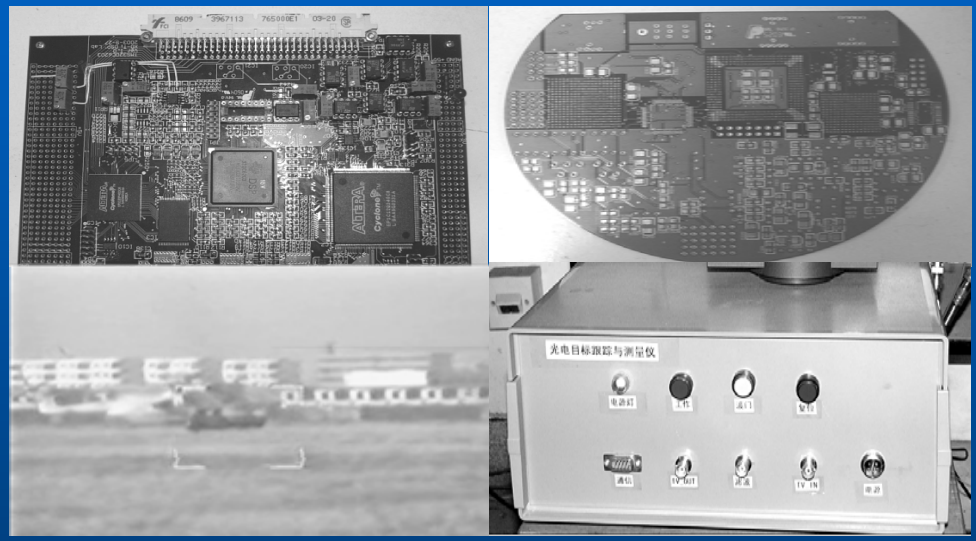
JPEG2000 high efficiency compression network camera monitoring system, which is China's first network camera based on JPEG2000 technology.

Information Coding and Transmission



MPEG4(ASP) codec based on SOC technology. This system implemented real-time MPEG4(ASP) compression codec. A MPEG4 integrated circuit chip is being designed after this system.

Information Coding and Transmission



Optical-electric/infrared image target tracker. Multimode tracking and data fusion are used to track targets in complicated background. Target tracking and processing can be finished within 20ms. Used in several practical systems.

Information Coding and Transmission

Turbo codec，typical data rate 400kbps, decode delay is less than 15ms (30MHz clock，frame length 4096). 2Mbps data rate can be achieved.

Information Coding and Transmission

- Recent papers:
  - Performance analysis of cascade trellis-block space-time codes, Keying Wu, Baoming Bai, and Li Ping, **IEEE Transactions On Communication**, vol.52, no.3, March 2004.
  - Low complexity concatenated two-state TCM schemes with near capacity performance， Li Ping，BaoMing Bai，Xinmei Wang，**IEEE Transactions on Information Theory,** 2003.vol.49,No.12
  - A Complementary Clipping Transform Technique for the Reduction of Peak-to-Average Power Ratio of OFDM System, Guangliang Ren, Hui Zhang and Yilin Chang, **IEEE Transactions on Consumer Electronics**, November 2003, Issue4.

Information Coding and Transmission

- Recent papers:
  - Algorithm for 3D reconstruction with both visible and missing data,Li Tang Chengke Wu, **IEE Electronics Letters**, 2003 Vol.39,No.23, pp.1640-1642
  - TTCM schemes based on time-varying trellis approach, S. Jiang, B. M. Bai, C. S. Leung, Li Ping, and H. Song, **IEE Electron. Lett**. vol.38, no.25, Dec. 2002.
  - The Non-Full Rank Space-Time Trellis Codes for Serially Concatenated Systems, Ying Li,Junhong Hui,Xinmei Wang, **IEEE Communication Letters,** 2002,Vol.6, No.9,
  - Timing Estimator for MC-CDMA System, Yingzi Luan, Jiandong Li, and Jiawei Yang, **IEE Electronics Letters,** 2002,Vol.38,No.18,pp1061-1063
  - Fast Decoding of LDPC codes using quantization， Yucheng He, Shaohui Sun, Xinmei Wang, **IEE Electronics Letters**, 2002,Vol.38,No.4
  - A novel turbo-TCM scheme based on concatenated tree codes, Bai B,Ho KS,Ping L, **IEICE Transactions on communications** 2002, Vol.E85B, No.9, pp1835-1837

Information Coding and Transmission

"Voice signal processing"

"Chinese Speech recognition and Synthesis vocoder and its rhythm information processing method"

Patent no. 86996, issued in 2002

Information Coding and Transmission

WANG Xinmei

WU Chengke

GE Jianhua

CHNAG Yilin

LU Zhaoyang

ZHANG Hailin

Information and Network Security

- Research Focus
  - New crypt techniques and their application
  - Block cipher
  - Authentication method in personal communication network
  - Security of e-commerce
  - Information hidden
  - Security in wireless IP network
  - Network intrusion detection

Information and Network Security

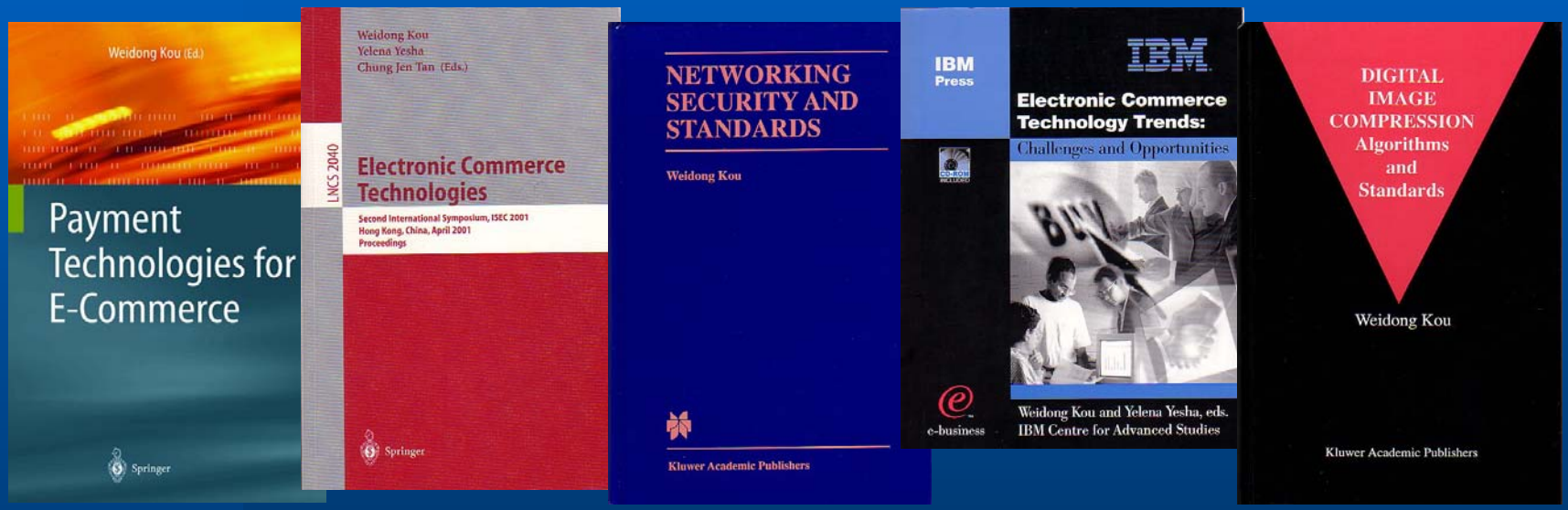
- Current projects:
  - Basic theories of cryptology based on mathematics
    973 program 99-04
  - Digital watermarking and information hidden techniques and their application 863 project 02-04
  - New crypt techniques and their applications,
    863 project 02-04
  - XML authentication protocol, National NSF 02-04
  - Basic problems and models of network information collection and analysis, National NSF(important program) 02-04

Information and Network Security

- Current projects:
  - –Traitor tracing schemes, National NSF 04-06
  - –Group Signature schemes, National NSF 04-06
  - –Safe electronic payment in un-trusted environment National NSF 04-06
  - –802.1x access control and key management 03-04
  - –Block cipher analysis methods 02-05
  - –New theories and algorithms of cryptology 02-05
  - –New stream ciphers 02-05
  - –Design and analysis of new block and stream ciphers 01-05
  - –Techniques of information hidden and network information spoofing 01-05

Information and Network Security

- Recent papers:



Books authored by Prof. Kou

Information and Network Security

Books authored by Prof.Wang Yunmin and Prof. Wang Xinmei wined National Science and Technology Book Award and were selected as Excellent Text Book for Graduate Students.

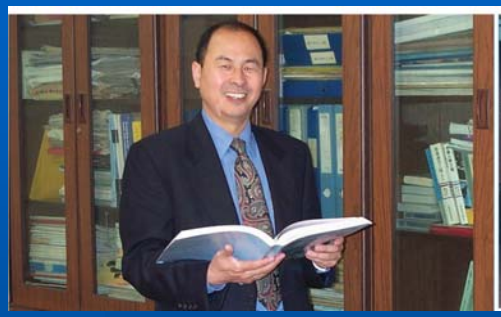
Information and Network Security

- Recent papers:
  - Generalized self-shrinking generator. Hu Yupu, Xiao Guozhen. **IEEE Transactions on Information Theory**. 2004. 50(4). 714-719.
  - Resilient functions over finite fields，Yupu Hu, Guozhen Xiao，**IEEE Transactions on Information Theory,** 2003.Vol.49.No8
  - Pseudo-randomness of the fourth class of GSS sequences. Hu Yupu, Xiao Guozhen. **Science in China F.** 2004. 47(2). 170-183.
  - Secure Web transaction with anonymous mobile agent over Internet，WangChangjie,Zhang FangGuo Wang Yumin，**J. Comput. Sci. & Technol.**, 2003.Vol.18,No.1

Information and Network Security

- Property of Finite Fields and Its Cryptography Application, Wei Baodian, Liu Dongsu, Ma Wenping Wang Xinmei，**IEE Electronics Letters**,2003.Vol.39, No.8
- SAWT:A new system for Secure and Anonymous Web Transaction over the internet，Wang CJ, Zhang FG, Wang YM，**Journal of Research and Practice in Information Technology,** 2002,Vol.34,No.1
- An Anonymity-Revoking e-Payment System with Smart Card. Yang Bo, Liu Dongsu and Wang Yumin，**International Journal on Digital Libraries**. 2002. Vol.3, pp291-296

Information and Network Security


KOU Weidong


XIAO Guozhen


WANG Yumin


HU Yupu


YANG Bo


LI Hui