

CURRICULUM VITAE

HUI ZANG

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EDUCATION

Ph.D., June 2001, GPA 4.0/4.0

Department of Computer Science, University of California, Davis,
Dissertation: "Design and Analysis of WDM Network Architectures,"
Advisor: Professor Biswanath Mukherjee

Master of Science (Computer Science), Dec. 1998, GPA 4.0/4.0

Department of Computer Science, University of California, Davis

Bachelor of Engineering (Computer Science), Jul. 1997, GPA 89/100

Department of Computer Science and Technology, Tsinghua University, P. R. China,
Thesis: "Communications in Multi-Agent Systems"

PROFESSIONAL EXPERIENCE

Principal Applied R&D Engineer (Oct. 2000 - Present)

Sprint Advanced Tech. Labs, Burlingame, CA

- IP network traffic analysis
- Technology assessment of MPLS, PWE3, QoS, Traffic Engineering and failure recovery
- Optical networking research and network optimization: protection and restoration, traffic grooming, Quality of service (QoS) and service level agreement (SLA)
- Algorithm design and modeling of Sprint's optical backbone network based on mesh-based restoration and grooming and compared to traditional SONET-based protection and grooming

Internship (Oct. 1999 - Sep. 2000)

Sprint Advanced Tech. Labs, Burlingame, CA

- Performed extensive research in protection and restoration schemes in wavelength-routed WDM networks. Proposed network control mechanisms and routing and wavelength-assignment algorithms for several protection and restoration schemes in wavelength-routed WDM networks.

Internship (Jun. 1999 - Sep. 1999)

IBM Almaden Research Center, San Jose, CA

- Designed and implemented a robust web server prototype with the state-of-the-art web and database technologies

Research Assistant (Apr. 1998 - Jun. 2000)

Department of Computer Science, UC Davis.

- Performed in-depth research in WDM network protocols and algorithms
- Designed a photonic slot routing network with novel capacity allocation and contention resolution algorithms
- Proposed and implemented various connection management approaches
- Performed extensive research in routing and wavelength assignment schemes in WDM networks

Research Assistant (Sep. 1996 - Jun. 1997)

Department of Computer Science, Tsinghua University, China

- Designed and implemented the communication sub-system in a distributed artificial-intelligence (DAI), multi-agent system (MAS) using socket and Inter-Process Communication technologies

Teaching Assistant (Sep. 1997 - Mar. 1998)

Department of Computer Science, UC Davis

- Tutored in computer networks, programming languages, computer algorithms

PUBLICATIONS

Book & Book Chapter

- [1] **Hui Zang**, "WDM Mesh Networks: Management and Survivability," Kluwer Academic Publishers, 2002.
- [2] Biswanath Mukherjee and **Hui Zang**, "Survey of State of the Art", book chapter in "WDM Optical Networks: Principles and Practice," Kluwer Academic Publishers, 2000.

Journal Publications

- [3] Canhui (Sam) Ou, Keyao Zhu, **Hui Zang**, Jing Zhang, Hongyue Zhu, Laxman H. Sahasrabudde, and Biswanath Mukherjee, "Traffic Grooming for Survivable WDM Networks – Dedicated Protection," to appear, *Journal of Optical Networking*.
- [4] Canhui Ou, **Hui Zang**, Narendra Singhal, Keyao Zhu, Laxman H. Sahasrabudde, Robert MacDonald, and Biswanath Mukherjee, "Sub-Path Protection for Scalability and Fast Recovery in WDM Mesh Networks," to appear, *IEEE Journal on Selected Areas in Communications*.
- [5] Antonio Nucci, Nina Taft, Patrick Thiran, **Hui Zang**, and Christophe Diot, "Increasing the Link Utilization in IP over WDM Networks using availability as QoS," to appear, *Photonic Network Communications*.
- [6] Canhui (Sam) Ou, Jing Zhang, **Hui Zang**, Laxman H. Sahasrabudde, and Biswanath Mukherjee, "New and Improved Approaches for Shared-Path Protection in WDM Mesh Networks," *IEEE/OSA Journal of Lightwave Technology*, to appear, April 2004.
- [7] Canhui (Sam) Ou, Keyao Zhu, **Hui Zang**, Laxman H. Sahasrabudde, and Biswanath Mukherjee, "Traffic Grooming for Survivable WDM Networks – Shared Protection," *IEEE Journal on Selected Areas in Communications*, vol. 21, no. 9, November 2003.
- [8] Hongyue Zhu, Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "Cost-Effective WDM Backbone Network Design with OXCs of Different Bandwidth Granularities," *IEEE Journal on Selected Areas in Communications*, vol. 21, no. 9, November 2003.
- [9] Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "A Comprehensive Study on Next-Generation Grooming Switches," *IEEE Journal on Selected Areas in Communications*, vol. 21, no. 7, September 2003.
- [10] Antonio Nucci, Nina Taft, Patrick Thiran, **Hui Zang**, and Christophe Diot, "Increasing the Link Utilization in IP over WDM Networks Using Availability as QoS", to appear, *SPIE Optical Networks Magazine*.
- [11] **Hui Zang**, Pin-Han Ho, Yinghua Ye, Chunsheng Xin, and Wushao Wen, "Issues in Designing Survivable Optical Switched Networks – Topics Overview on APOC 2001," *SPIE Optical Networks Magazine*, vol. 4, no. 3, May/June 2003.
- [12] Hongyue Zhu, **Hui Zang**, Keyao Zhu, and Biswanath Mukherjee, "Dynamic Traffic Grooming in WDM Mesh Networks Using a Novel Graph Model," *SPIE Optical Networks Magazine*, vol. 4, no. 3, May/June 2003.
- [13] **Hui Zang** and Biswanath Mukherjee, "Path-Protection Routing and Wavelength-Assignment (RWA) in WDM Mesh Networks under Duct-Layer Constraints," *IEEE/ACM Transactions on Networking*, vol. 11, no. 2, Apr. 2003.
- [14] Hongyue Zhu, **Hui Zang**, Keyao Zhu, and Biswanath Mukherjee, "A Novel, Generic Graph Model for Traffic Grooming in Heterogeneous WDM Mesh Networks," *IEEE/ACM Transaction on Networking*, vol. 11, no. 2, Apr. 2003.
- [15] Salbella, R.; Hui Zang, "Guest editorial: Traffic engineering in optical networks," *IEEE Network*, vol. 17, no: 2, March-April 2003.
- [16] **Hui Zang**, Jason P. Jue, Laxman Sahasrabudde, S. Ramamurthy, and Biswanath Mukherjee, "Dynamic Lightpath Establishment in Wavelength-Routed WDM Networks," *IEEE Communications Magazine*, Sept. 2001.
- [17] **Hui Zang** and Biswanath Mukherjee, "Connection Management for Survivable Wavelength-Routed WDM Mesh Networks," *SPIE Optical Networks Magazine*, vol. 2, no. 4, July 2001.
- [18] **Hui Zang**, Jason P. Jue, and Biswanath Mukherjee, "Capacity Allocation and Contention Resolution in Photonic Slot Routing Networks," *IEEE/OSA Journal of Lightwave Technology*, vol. 18, no. 12, Dec. 2000.
- [19] **Hui Zang**, Jason P. Jue, and Biswanath Mukherjee, "A review of routing and wavelength assignment approaches for wavelength-routed optical WDM networks," *SPIE Optical Networks Magazine*, vol. 1, no. 1, Jan. 2000.

Conference Publications

- [20] Canhui (Sam) Ou, Jing Zhang, **Hui Zang**, Laxman H. Sahasrabudde, and Biswanath Mukherjee, "Near-Optimal Approaches for Shared-Path Protection in WDM Mesh Networks," *IEEE ICC 2003*.
- [21] Jing Zhang, Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "A New Provisioning Framework to Provide Availability-Guaranteed Service in WDM Mesh Networks," *IEEE ICC 2003*.
- [22] Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "Exploiting the Benefits of Virtual Concatenation in Optical Transport Networks," *OFC'03*, March 2003.
- [23] Jing Zhang, Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "Service Provisioning to Provide Per-Connection-Based Availability Guarantee in WDM Mesh Networks," *OFC'03*, March 2003.
- [24] Canhui Ou, Keyao Zhu, **Hui Zang**, Laxman Sahasrabudde, and Biswanath Mukherjee, "Survivable Traffic Grooming in WDM Networks," *OFC'03*, March 2003.
- [25] Hongyue Zhu, Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "Cost-Effective WDM Backbone Network Design with OXCs of Different Bandwidth Granularities," *OFC'03*, March 2003.
- [26] Hongyue Zhu, **Hui Zang**, Keyao Zhu, and Biswanath Mukherjee, "Dynamic Traffic Grooming in WDM Mesh Networks Using a Novel Graph Model," *Globecom 2002*, November 2002.
- [27] Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "The Design of WDM Mesh Networks with Sparse Grooming Capability," *Globecom 2002*, November 2002.
- [28] **Hui Zang**, Renxiang Huang, and James Pan, "Designing a Hybrid Shared-Mesh Protected WDM Networks with Sparse Wavelength Conversion and Regeneration," *SPIE APOC 2002*, October 2002.
- [29] **Hui Zang**, Robert A. MacDonald, and James Pan, "Wavelength Converter Placement in WDM Mesh Networks with Shared Protection Schemes," *NFOEC'02*, September 2002.
- [30] Keyao Zhu, Hongyue Zhu, **Hui Zang**, Robert MacDonald, and Biswanath Mukherjee, "Provisioning Connections of Different Bandwidth Granularities in Irregular Mesh-Based Heterogeneous WDM Backbone Networks," *NFOEC'02*, September 2002.
- [31] Jing Zhang, Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "A New Model, Network Architecture, and Control Mechanism for Connection Provisioning to Satisfy Service-Level Agreements (SLAs) in Optical WDM Backbone Networks," *NFOEC'02*, September 2002.
- [32] Antonio Nucci, Nina Taft, Patrick Thiran, **Hui Zang**, and Christophe Diot, "Increasing Link Utilization in IP over WDM Networks," *OptiComm 2002*, Boston, MA, July – Aug, 2002.
- [33] Canhui Ou, **Hui Zang**, and Biswanath Mukherjee, "Sub-Path Protection for Scalability and Fast Recovery in WDM Mesh Networks," *IEEE/OSA OFC '02*, Anaheim, CA, March 2002.
- [34] **Hui Zang**, Canhui Ou, and Biswanath Mukherjee, "Path-Protection Routing and Wavelength-Assignment in WDM Mesh Networks under Shared-Risk-Link-Group Constraints," *Proc. SPIE APOC '01*, Beijing, China, Nov. 2001.
- [35] Patrick Thiran, Nina Taft, Christophe Diot, **Hui Zang** and Robert MacDonald "A protection-based approach to QoS in Packet over fiber networks," *Proc. Tyrrhenian International Workshop on Digital Communications (IWDC 2001)*, Taormina, Italy, Sept 2001. Published in 'Evolutionary trends of the Internet', Sergio Palazzo editor, vol. LCNS 2170, Springer-Verlag, pp. 266-278, 2001.
- [36] **Hui Zang**, Jason P. Jue, and Biswanath Mukherjee, "Photonic slot routing in all-optical WDM mesh networks," *IEEE GLOBECOM '99*, Rio de Janeiro, Dec. 1999.
- [37] **Hui Zang**, Laxman Sahasrabudde, Jason P. Jue, S. Ramamurthy, and Biswanath Mukherjee, "Connection management for wavelength-routed WDM networks," *IEEE GLOBECOM '99*, Rio de Janeiro, Dec. 1999.

Submitted for Review

- [38] Jing Zhang, Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "Availability-Aware Provisioning Strategies for Differentiated Services in WDM Mesh Networks, " submitted to *IEEE/ACM Transaction on Networking*.

Technical Reports

- [1] Canhui Ou, **Hui Zang**, Narendra Singhal, Keyao Zhu, Laxman H. Sahasrabudhe, Robert MacDonald, and Biswanath Mukherjee, "Sub-path protection for scalability and fast recovery in WDM mesh networks," University of California, Davis, Computer Science technical report CSE-2002-32, Oct. 2002.
- [2] Jing Zhang, Keyao Zhu, **Hui Zang**, and Biswanath Mukherjee, "A new provisioning framework to provide availability-guaranteed service in WDM mesh networks," University of California, Davis, Computer Science technical report CSE-2002-30, Oct. 2002.
- [3] **Hui Zang**, Jason P. Jue, and Biswanath Mukherjee, and Debasish Datta, "Photonic Slot Routing in All-Optical Packet-Switched WDM Mesh Networks," University of California, Davis, Computer Science technical report CSE-1999-13, Dec. 1999.

PATENTS

- Area-based sub-path protection for communication networks, Hui Zang and Canhui Ou, pending for approval.
- Software model for communication networks, Hui Zang and Hongyue Zhu, approved March 2004.
- Communication network design with wavelength converters, Hui Zang, pending for approval.

INVITED TALKS

- Invited speaker, "Provisioning and Protection of Various Granularity Connections with GMPLS: Challenges and Solutions," High Speed Networking (HSN) 2003 Workshop, San Francisco, CA, March 30, 2003
- Invited speaker, "Connection Management in Wavelength-Routed WDM Networks," IPoW '00, Paris, France, November 27 – 30, 2000
- Panelist, "Optical Networking: What is Its Future?" IEEE Infocom 2003, San Francisco, CA, March 30 – April 3, 2003

PROFESSIONAL ACTIVITIES

- Guest Editor, IEEE Network special issue on traffic engineering in optical networks
- Technical Program Committee member, Broadband Networks 2004, Broadband Optical Networking Symposium, October 25-29, 2004
- Technical Program Committee member and Session Chair, IEEE Globecom 2003, Optical Networking and Systems symposium, San Francisco, CA, December 1 – 5, 2003
- Technical Program Committee member, SPIE/IEEE/ACM OptiComm'03
- International Scientific Committee member, DRCN '03
- Panel co-chair and session chair, OptiComm'02
- Scientific committee member, IPoW '00-02
- Technical Program Committee member, SPIE APOC'02.
- Reviewer (conferences):
 - IEEE Infocom '01-04
 - IEEE ICC '02-03
 - IEEE Globecom'01-04
 - SPIE OptiComm'01-02
 - NFOEC '02-03
 - IWQoS '04
 - Networking 2004, etc.

- Reviewer (journals & magazines):
 - IEEE/ACM Transaction on Networking
 - IEEE Journal on Selected Areas in Communications
 - IEEE/OSA Journal of Lightwave Technology
 - IEEE Communications Magazine
 - IEEE Network
 - SPIE/Kluwer Optical Networks Magazine
 - IEEE Communication Letters, Networks
 - IEEE Transaction on Systems, Man and Cybernetics.
 - Computer Networks
 - Photonics Technology Letters, etc
- Member of IEEE Communications Society

AWARDS AND HONORS

- Sprint Values Excellence Award, September 2002, December 2002, and January 2003.
- IEEE Student Travel Grant, 1999.
- NRTF Fellowship, University of California, Davis, Department of Computer Science, 1997-2000.
- Excellent Student Scholarship, Tsinghua University, 1993-1996.

REFERENCES

Available upon request.