

YANG YANG

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SUMMARY OF QUALIFICATIONS

- More than nine years of solid experience in Electrical Engineering, specialized in multimedia processing, multi-view video coding, distributed source coding and digital signal processing
- More than ten years of experience as a C/C++ developer
- Extensive experience with image/video coding standards and advanced source/channel code designs
- Hands-on experience with stereoscopic vision, image segmentation, and near-real-time 3D TV systems
- Strong skills in both algorithm design and system implementation

EDUCATION

12/2008	Ph.D.	Electrical Engineering	Texas A&M University, College Station, TX
08/2004	M.S.	Electrical Engineering	Texas A&M University, College Station, TX
07/2002	B.S.	Electrical Engineering	Tsinghua University, Beijing, P. R. China

RESEARCH EXPERIENCE

01/2009	- present	Postdoc researcher	Dept of ECE, Texas A&M University, College Station, TX
08/2002	- 12/2008	Research assistant	Dept of ECE, Texas A&M University, College Station, TX
09/2001	- 07/2002	Research assistant	Dept of EE, Tsinghua University, Beijing, P. R. China

INDUSTRY EXPERIENCE

05/2008 - 08/2008 Summer intern AT&T Shannon Labs, Florham Park, NJ

TECHNICAL SKILLS

- *Programming languages:* C/C++, Matlab
- *Operating systems:* Windows, Unix
- *Image/video standards:* JPEG, JPEG2000, MPEG2, MPEG4, H.264

AWARDS AND HONORS

2011	Top 10% Paper Award	2011 IEEE MMSP Workshop
2007-2008	Fellowship for Academic Excellence	ECE department, Texas A&M university
2004	Scholarship for Academic Excellence	ECE department, Texas A&M university
2000	North Telecom Scholarship for Excellent Performance	Tsinghua University

PROFESSIONAL ACTIVITIES

- 1) Program committee member, *6th International ICST Wireless Internet Conference (WICON'11)*.
- 2) Program committee member, *2nd International Conference on Image and Signal Processing (CISP'09)*.
- 3) Reviewer, *IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE Transactions on Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Systems, Man, and Cybernetics (part B), IEEE Signal Processing Letters, EURASIP Journal on Advances in Signal Processing, and EURASIP Journal on Wireless Communications and Networking.*

EXPERIENCE AND ACCOMPLISHMENTS

- 01/2009-present, Postdoc Researcher, ECE Department, Texas A&M University
 - Distributed multi-view video coding
 - * Designed and implemented a depth-map-aided distributed multi-view video codec with a rate saving of up to 9% (**Top 10% Paper Award**)
 - Distributed source coding
 - * Provided a sufficient condition for sum-rate tightness in quadratic Gaussian multi-terminal source coding
 - * Characterized the supremum sum-rate loss in quadratic Gaussian multi-terminal source coding
 - * Provided sufficient conditions for sum-rate/rate region tightness in generalized Gaussian CEO problem
 - * Provided partially tight lower and upper sum-rate bounds for distributed compression of linear functions
 - Dirty-paper coding (channel coding with encoder side information)
 - * Designed the best-performing dirty-paper codes based on TCQ and LDPC codes that operate within 0.37 dB of the theoretical limit
- 05/2008-08/2008, Summer Intern, AT&T Shannon Labs, Florham Park, NJ
 - Multi-view video capturing, processing, and display
 - * Multiple camera calibration: Modified the stereo calibration toolbox for multiple camera calibration
 - * Multi-view video capturing: Realization of synchronized multi-view video capture
 - * 3D video Display: Developed software to display captured 3D videos on Philips 3D monitor
 - Visual hull computation
 - * Designed and realized a 3D environment for visual hull computation
 - * Wrote software for visual hull computation using silhouettes from 9 (mirrored) cameras views
 - High precision depth estimation
 - * Introduced segment-based shape-adaptive orthogonal basis sets for depth map computation
 - * Incorporated visual hull information into depth estimation algorithm
- 08/2002-12/2008, Research Assistant, ECE Department, Texas A&M University
 - Distributed source coding
 - * Characterized the sum-rate loss of symmetric multi-terminal source coding (**fellowship awarding**)
 - * Designed and implemented the best-performing Wyner-Ziv codes based on TCQ and LDPC codes that operate within 0.20 dB of the rate-distortion limit (**scholarship awarding**)
 - * Designed and implemented the best-performing two-terminal source codes that operate within 0.14 bit per sample of the theoretical limit
 - Distributed multi-view video coding
 - * Designed the first distributed multi-view video coder that outperforms separate H.264/AVC coding
 - Reliable multimedia transmission using distributed source coding principles
 - * Designed and implemented an efficient scheme for transmission of multimedia bit-stream over wireless/wireline networks based on H.264/AVC video coding and multi-terminal source coding
 - Multimedia security
 - * Designed an image data-hiding scheme with the highest data-hiding capacity and excellent robustness
 - * Investigated duality between data-encryption and data-hiding problems
 - Advanced source/channel coding
 - * Designed the best-performing trellis-coded quantizers: within 0.08 dB of the rate-distortion limit
 - * Strong experience in density evolution/EXIT chart based LDPC/IRA code design
- 09/2001-07/2002, Research Assistant, EE Department, Tsinghua University, China
 - Digital watermarking for MPEG audio layer III
 - * Designed an efficient watermarking scheme for MPEG audio layer III with high capacity and excellent subjective audio quality

PATENT

- 1) Y. Yang and Z. Xiong, "Wyner-Ziv coding based on TCQ and LDPC codes," U.S. Patent 7414549, 08/2008.

BOOK CHAPTER

- 1) Z. Xiong, A. Liveris, and Y. Yang, "Distributed source coding," *Handbook on Sensor and Array Processing*, R. Liu and S. Haykin (Eds.), Wiley, 2009.

JOURNAL PAPERS

- 1) Y. Yang, V. Stankovic, and Z. Xiong, "Image encryption and data hiding: Duality and code designs", in *preparation*.
- 2) Y. Yang and Z. Xiong, "Distributed compression of linear functions: Partial sum-rate tightness and gap to optimal sum-rate", to be submitted to *IEEE Transactions on Information Theory*.
- 3) Y. Zhang, Y. Yang, and Z. Xiong, Code design for quadratic Gaussian multiterminal source coding," submitted to *IEEE Transactions on Signal Processing*, May 2011.
- 4) Y. Yang and Z. Xiong, "On the generalized Gaussian CEO problem," revised for *IEEE Transactions on Information Theory*, April 2011.
- 5) Y. Yang, Y. Zhang, and Z. Xiong, "A new sufficient condition for sum-rate tightness in quadratic Gaussian multiterminal source coding," submitted to *IEEE Trans. Information Theory*, June 2010.
- 6) Y. Yang and Z. Xiong, "The sum-rate bound for a new class of quadratic Gaussian multiterminal source coding problems," *IEEE Transactions on Information Theory*, to appear.
- 7) Y. Yang, Y. Zhang, and Z. Xiong, "On the sum-rate loss of quadratic Gaussian multiterminal source coding," *IEEE Transactions on Information Theory*, vol. 57, pp. 5588-5614, September 2011.
- 8) Y. Sun, Y. Yang, A. Liveris, V. Stankovic, and Z. Xiong, Near-capacity dirty-paper code design: a source-channel coding approach," *IEEE Transactions on Information Theory*, vol. 55, pp. 3013-3031, July 2009.
- 9) C. Khirallah, V. Stankovic, L. Stankovic, Y. Yang, and Z. Xiong, "Compress-spread-forward with multiterminal source coding and complete complementary sequences," *IEEE Transactions on Communications*, vol. 57, pp. 884-887, April 2009.
- 10) Y. Yang, V. Stankovic, Z. Xiong, and W. Zhao, "Two-terminal video coding," *IEEE Transactions on Image Processing*, vol. 18, pp. 534-551, March 2009.
- 11) C. Khirallah, V. Stankovic, L. Stankovic, Y. Yang, and Z. Xiong, "Bandwidth efficient multi-station streaming based on complete complementary sequences," *IEEE Transactions on Wireless Communications*, vol. 8, pp. 552-556, February 2009.
- 12) Y. Yang, S. Cheng, W. Zhao, and Z. Xiong, "Wyner-Ziv coding based on TCQ and LDPC codes," *IEEE Transactions on Communications*, vol. 57, pp. 376-387, February 2009.
- 13) Y. Yang, V. Stankovic, W. Zhao, and Z. Xiong, "On multiterminal source code design," *IEEE Transactions on Information Theory*, vol. 54, pp. 2278-2302, May 2008.
- 14) V. Stankovic, Y. Yang, and Z. Xiong, "Distributed source coding for multimedia multicast over heterogeneous networks," *IEEE Journal on Selected Topics in Signal Processing: Special Issue on Network-Aware Multimedia Processing and Communications*, vol. 1, pp. 220-230, August 2007.

CONFERENCE PAPERS

- 1) Y. Yang and Z. Xiong, "A hybrid random-structured coding scheme for the quadratic Gaussian two-terminal source coding problem under a covariance matrix distortion constraint," in Proc. UCSD Workshop on Information Theory and its Applications, San Diego, CA, February 2012.
- 2) Y. Yang, Z. Xiong, Y. Wu, and P. Zhang, "Density evolution based framework for dirty-paper code design using TCQ and multilevel LDPC codes," submitted to IEEE International Conference on Communications, Ottawa, Canada, June 2012.
- 3) Y. Zhang, Y. Yang, and Z. Xiong, "Depth camera assisted multiterminal video coding," in Proc. IEEE Multimedia Signal Processing Workshop, Hangzhou, China, October 2011. (**Top 10% Paper Award**).
- 4) N. Jiang, Y. Yang, A. Host-Madsen, and Z. Xiong, "Energy efficient hybrid transmission of correlated sources over the MAC," in Proc. Allerton'11, Monticello, IL, September 2011.

- 5) Y. Yang and Z. Xiong, "Distributed compression of linear functions: Partial sum-rate tightness and gap to optimal sum-rate," in Proc. IEEE International Symposium on Information Theory, Saint Petersburg, Russia, August 2011.
- 6) Y. Yang and Z. Xiong, "An improved lattice based scheme for lossy distributed compression of linear functions," in Proc. Information Theory and Applications Workshop, San Diego, CA, February 2011.
- 7) Y. Yang, Y. Zhang, and Z. Xiong, "The generalized quadratic Gaussian CEO problem: New cases with tight rate region and applications," in Proc. IEEE International Symposium on Information Theory, Austin, TX, June 2010.
- 8) Y. Yang, Y. Zhang, and Z. Xiong, "On the sum-rate loss of quadratic Gaussian multiterminal source coding," in Proc. IEEE International Symposium on Information Theory, Austin, TX, June 2010.
- 9) Y. Yang, Y. Zhang, and Z. Xiong, "A new sufficient condition for sum-rate tightness in quadratic Gaussian multiterminal source coding," in Proc. Information Theory and Applications Workshop, San Diego, CA, February 2010.
- 10) Y. Yang and Z. Xiong, "On general distributed source coding of correlated Gaussian remote sources," in Proc. ITW'10, Cairo, Egypt, January 2010.
- 11) Y. Yang and Z. Xiong, "The sum-rate bound for a new class of quadratic Gaussian multiterminal source coding problems," in Proc. Allerton'09, Monticello, IL, October 2009 (**invited**).
- 12) Y. Zhang, Y. Yang, and Z. Xiong, "Three-terminal video coding," in Proc. IEEE Multimedia Signal Processing Workshop, Rio de Janeiro, Brazil, October, 2009.
- 13) Y. Yang and Z. Xiong, "Distributed source coding without Slepian-Wolf compression," in Proc. IEEE International Symposium on Information Theory, Seoul, Korea, June 2009.
- 14) Y. Zhang, Y. Yang, and Z. Xiong, "Code design for quadratic Gaussian multiterminal source coding: the symmetric case," in Proc. IEEE International Symposium on Information Theory, Seoul, Korea, June 2009.
- 15) B. Bai, Y. Yang, C. Lei, P. Boulanger, and J. Harms, "Symmetric distributed multiview video coding," in Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing, Taipei, China, April 2009.
- 16) Y. Yang and Z. Xiong, "Distributed source coding without Slepian-Wolf compression," in Proc. Information Theory and Applications Workshop, San Diego, CA, February 2009.
- 17) B. Bai, Y. Yang, Z. Xiong, P. Boulanger, and J. Harms, "Symmetric distributed source coding using LDPC code," in Proc. IEEE International Conference on Communications, Beijing, China, May 2008.
- 18) Y. Yang, and Z. Xiong, "The supremum sum-rate loss of quadratic Gaussian direct multiterminal source coding," in Proc. Information Theory and Applications Workshop, San Diego, CA, January 2008.
- 19) C. Khirallah, V. Stankovic, L. Stankovic, Y. Yang, and Z. Xiong, "Compress-spread-forward with multiterminal source coding and complete complementary sequences," in Proc. Packet Video Workshop'07, Lausanne, Switzerland, November 2007.
- 20) C. Khirallah, V. Stankovic, L. Stankovic, Y. Yang, and Z. Xiong, "Distributed video streaming using complete complementary sequences," in Proc. Picture Coding Symposium'07, Lisbon, Portugal, November 2007.
- 21) C. Khirallah, V. Stankovic, L. Stankovic, Y. Yang, and Z. Xiong, "Bandwidth optimized wireless distributed streaming from multiple terminals," in Proc. Allerton'07, Monticello, IL, September 2007.
- 22) Y. Yang, V. Stankovic, W. Zhao, and Z. Xiong, "Multiterminal video coding," in Proc. IEEE International Conference on Image Processing, San Antonio, TX, September 2007.
- 23) Y. Yang, V. Stankovic, and Z. Xiong, "Image encryption and data hiding: Duality and code designs," in Proc. ITW-2007, IEEE Information Theory Workshop, Lake Tahoe, CA, September 2007.
- 24) V. Stankovic, Y. Yang, and Z. Xiong, "Efficient multimedia multicast using distributed source coding," in Proc. IEEE International Conference on Communications, Glasgow, Scotland, June 2007.
- 25) Y. Yang, V. Stankovic, W. Zhao, and Z. Xiong, "Multiterminal video coding," in Proc. Information Theory and Applications Workshop, CA, January 2007.
- 26) V. Stankovic, Y. Yang, and Z. Xiong, "Video multicast over heterogeneous networks based on distributed source coding principles," in Proc. IEEE International Conference on Image Processing, Atlanta, GA, October 2006 (**invited**).
- 27) Y. Yang, Y. Sun, V. Stankovic, and Z. Xiong, "Image data-hiding based on capacity-approaching dirty-paper coding," in Proc. SPIE EI'06: Security, Steganography, and Watermarking of Multimedia Contents VIII, San

- Jose, CA, January 2006.
- 28) Y. Yang, V. Stankovic, Z. Xiong, and W. Zhao, "On multiterminal source code design," in Proc. Data Compression Conference'05, Snowbird, UT, March 2005.
 - 29) Y. Yang, V. Stankovic, Z. Xiong, and W. Zhao, "Multiterminal source code design based on Slepian-Wolf coded quantization," in Proc. Allerton'04, Monticello, IL, October 2004 (**invited**).
 - 30) Y. Yang, V. Stankovic, Z. Xiong, and W. Zhao, "Asymmetric code design for remote multiterminal source coding," in Proc. Data Compression Conference '04, Snowbird, UT, March 2004.
 - 31) Y. Yang, S. Cheng, Z. Xiong, and W. Zhao, "Wyner-Ziv coding based on TCQ and LDPC codes," in Proc. 37th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2003.

RECOMMENDATIONS

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