

Yong Li

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Objective

Seeking a system design engineer position in communications and digital signal processing (DSP).

Education

9/1999 ~ 7/2005 Ph.D, Electrical and Computer Engineering (ECE), *University of Minnesota*.

9/1997 ~ 6/1999 M.Eng, School of Electrical & Electronics Engineering, *Nanyang Technological University*, Singapore.

9/1992 ~ 6/1997 B.S.E.E., Electronics Engineering, *Tsinghua University*, P.R.China.

Qualification

- Solid research background in communications and DSP, including channel coding (convolutional code/turbo code), iterative decoding, turbo equalization, reduced-complexity detection, channel estimation.
- Experience in wireless system modeling, analysis and simulations.
- Good knowledge on the IEEE 802.11a (WLAN) standard, basic knowledge on GSM, IS-95, cdma2000, and WCDMA standards.
- Proficient in C, Matlab, Latex, capable in VHDL and real-time DSP programming.
- Familiar with the CAD tools: Modelsim, Xilinx Foundation Series, Network Simulator (NS-2).
- Windows NT administration and Web page maintenance.

Research

- Reduced-complexity detection for MIMO channels: Derived a constraint-delay MAP algorithm for MIMO detection, based on the trellis representation of the MIMO signals. It is a generalization of the successive interference cancellation while relying on soft-decision feedback. Excellent performance/complexity tradeoff can be achieved compared to existing schemes, such as BLAST detection, sphere decoding and ML detection. Applying precoding at the transmitter side to generate a spatially partial response channel will collaborate with this detection algorithm and enhance the performance significantly.
- Bit-interleaved coded modulation (BICM) with space-time coding: Considered the concatenation of BICM with trellis or block type of space-time coding, to exploit the available time-frequency diversity while guaranteeing the spatial diversity; conducted performance evaluation through simulations, error bounds, and extrinsic information transfer (EXIT) chart analysis.
- Orthogonal Frequency Division Multiplexing (OFDM) modulations: Proposed a decision-directed channel estimation algorithm for OFDM in MIMO case, utilizing the available preamble and data information, and is backward-compatible to 802.11a standard.
- Turbo code / Low Density Parity Check (LDPC) coding in magnetic recordings: Investigated high-rate Turbo code with precoders, and LDPC with message-passing decoding algorithm based on factor graph, and conducted the convergence analysis by density-evolution technique.

Working Experience

- 3/2001 ~ 9/2001 System Engineer in *Bermai Communications, Minnesota*. Conducted physical layer simulations for IEEE 802.11a standard, and investigated some options other than the standard-specified, such as turbo code/LDPC code, multiple transmit/receive antennas, then provided performance figures to the design groups.
- 9/2000 ~ 12/2000 Teaching assistant for *Probability and Stochastic Processes*, ECE department, University of Minnesota
- 9/1997 ~ 6/1999 Project Staff in Telecommunication Laboratory, School of EEE, *Nanyang Tech. University, Singapore*. Investigated the applications of Turbo code/Serially-concatenated code/Turbo Equalization in ISI channels.

Relevant Courses & Projects

- Digital Communications
- Wireless Communications
- Digital Signal Processing
- VLSI Design I
 - Layout design of 16-bit adder
- Digital Logic Design with VHDL
 - Implementation of arithmetic operations on FPGA
- VLSI Lab
 - Simulation & Synthesis of OFDM Modem (IFFT/FFT implementation)
- Advanced Computer Networks
 - Simulation of Storage Area Network (SAN)
- Information Theory and Coding
- Error-Correction Coding
- Probability and Stochastic Processes
- Detection and Estimation Theory

Honors and Professional Activities

- 1998 ~ Now IEEE student member, paper reviewer for IEEE Transactions on Communications, Information Theory, Magnetic Recordings, and IEEE ICC05 conference.
- 1995/93 Tsinghua Excellent Students Scholarship, 1st/2nd prize.

Publications

1. Y. Li and J. Moon, "Performance analysis of bit-interleaved space-time coding for block fading channels," under review by *IEEE Trans. on Information Theory*.
2. Y. Li and J. Moon, "On reduced complexity soft demapping in MIMO systems with spatial multiplexing," *IEEE ICC'05*, Seoul, Korea, May 2005.
3. Y. Li and J. Moon, "Performance analysis of bit-interleaved coded modulation for MIMO-OFDM in block fading channels," *IEEE VTC-spring.*, Milan, Italy, June 2004.
4. Y. Li and J. Moon, "Increasing data rates through iterative coding and antenna diversity in OFDM-based wireless communication," *IEEE GLOBECOM*, San Antonio, TX, Nov. 2001.
5. Y. Li and J. Moon, "Higher data rate wireless transmission with OFDM," *IEEE ICICS*, Singapore, October 2001.
6. Y. Li and W. H. MOW, "Iterative decoding of serially concatenated convolutional codes over multipath intersymbol-interference channels," *IEEE ICC*, Vancouver, Canada, June 1999.
7. Y. Li, "Hybrid concatenated equalization scheme for multipath fading channels with intersymbol interference," *IEEE VTC*, Houston, USA, May 1999.