

WENHUI(BERYL) SUI

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EDUCATION

University of California, Los Angeles
Ph.D., Electrical and Computer Engineering

Los Angeles, CA
Expected Graduation: June 2025

University of California, Los Angeles
Combined B.S. & M.S., Departmental Scholar in Electrical Engineering
UCLA ECE Fast Track Honors Program
UCLA Eta Kappa Nu Publicity & Secretary

Los Angeles, CA
March 2023

RESEARCH EXPERIENCE

UCLA Communications Systems Laboratory, Professor Richard Wesel

Ph.D. Student

March 2023 - Present

- Emphasis in error correction codes and information theory. Focus on lowering decoding complexity for convolutional codes (CCs).
- Identified a close estimation for the performance of punctured CCs concatenated with cyclic redundancy checks (CRCs) through a distance spectrum union bound. Built MatLab scripts for both tail-biting (TB) and zero-terminating (ZT) cases.
- Mentored undergraduate students through their individual research projects at UCLA summer research programs for four years. Tutored students on probability and communications systems. Prepared lecture-style notes and assignments.

UCLA Communications Systems Laboratory, Professor Richard Wesel

Undergraduate Researcher

June 2019 - March 2023

- Designed a new algorithm (in MatLab and C++) for decoding rate- $(n-1)/n$ CCs which lowered the decoding complexity by approximately 2^n while maintaining the same error detection and correction levels.
- Improved the brute-force implementation for searching suboptimal codewords with a min heap for better runtime performance at high noise levels.

SK Hynix Memory Solutions America Inc.

Algorithms Engineer Intern

June 2022 - September 2022

- Created MatLab simulations to evaluate the performance gap between belief-propagation (BP) and quantized min-sum (MS) algorithms for low-density parity-check (LDPC) codes.
- Researched on strategies to identify optimal scaling factors to improve the error rates of quantized MS, such as 2-D normalization, exponential approximation, and neural networks.
- Found optimal scaling factors through neural networks, which improved the performance of quantized MS by 0.3 dB.

SKILLS & COURSES

- Programming Languages: MatLab, Python, C++, C, Bash, Java
- Hardware: Schematic and PCB design, CAD, LabView, Verilog
- Courses: Wireless Communications Systems; Digital Communication Systems; Digital Signal Processing for Audio & Images; Neural Signal Processing; Neural Networks and Deep Learning; Optimization
- Projects: MIDC protocol for hybrid array; V-BLAST MIMO Decoding; Speaker dialect recognition using acoustic features; ML classification of lymph node cancer; CNN with LSTM and VAE for EEG dataset

SELECTED PUBLICATIONS

W. Sui, B. Towell, Z. Qu, E. Min, and R. Wesel, "Linearity-Enhanced Serial List Decoding of Linearly Expurgated Tail-Biting Convolutional Codes," accepted for ISIT 2024, Athens, Greece, Jul 7-12, 2024.

W. Sui, B. Towell, A. Asmani, H. Yang, H. Grissett, and R. Wesel, "CRC-Aided High-Rate Convolutional Codes With Short Blocklengths for List Decoding," in *IEEE Transactions on Communications*, vol. 72, no. 1, pp. 63-74, Jan. 2024.

W. Sui, H. Yang, B. Towell, A. Asmani, and R. Wesel, "High-Rate Convolutional Codes with CRC-Aided List Decoding for Short Blocklengths," ICC 2022, Seoul, South Korea, May 16-20, 2022.