Ziyuan Zhu

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Education

University of California, San Diego   *California, US*
Doctor of Philosophy, Communication Theory and Systems   *Sept 2023 - Current*
- Supervisor: Professor Paul H. Siegel

University of California, San Diego   *California, US*
Master of Science, Communication Theory and Systems   *Sept 2021 - Mar 2023*
- GPA: 3.763/4.00
- Courses: Modern Communication System, Algebraic Coding, Probabilistic Coding, Statistical Learning, Information Theory
- Employed as a graduate student researcher

Xi'an Jiaotong University   *Xi'an, China*
Bachelor of Engineering, Information Engineering   *Sept 2017 - July 2021*
- GPA: 3.70/4.00
- Scholarship for Academic Excellence in 2018
- Scholarship for Academic Excellence in 2020

Research Experience

On the construction of concatenated polar codes (Paper submitted)   *STAR group, UCSD*
Graduate student researcher   *Oct 2023 - Jan 2024*
- Stopping set analysis on the extended factor graph
- Revised density evolution to accommodate concatenated architecture
- **A paper is submitted to ISIT conference.**

Systematic Polar Codes Analysis   *STAR group, UCSD*
Graduate student researcher   *Sept 2022 - Jun 2023*
- Analyze various features of systematic polar codes, such as BER property.
- Compare the IOWEF of systematic polar code with conventional polar code, using the orbits obtained by LTA group.

Polar Codes with Local-Global Decoding (Paper published)   *STAR group, UCSD*
Graduate student researcher   *Sept 2021 - Sept 2022*
- Introduced a new structure for polar codes that offers both local and global decoding by coupling several parts of polar codes.
- Included by UCSD innovation disclosure.
- **A paper is published in Asilomar conference. DOI: 10.1109/IEEECONF56349.2022.10051996**

Performance Analysis of Polar Codes in 5G Channel Coding   *XJTU, China*
Undergraduate researcher   *Nov 2020 - July 2021*
- Simulated SC, SCL, CA-SCL, BP, BPL decoding algorithms of polar codes.
- Applied three ways (BA, GA, 3GPP standard) to select frozen bit channels.
- Simulated polar codes over OFDM system.
- Defended thesis on this project.

Channel Coding and Its performance Analysis   *XJTU, China*
Undergraduate researcher   *Nov 2019 - Nov 2020*
- Simulated Viterbi, List-Viterbi, BCJR decoding algorithms for convolutional codes.
- Simulated WAVA decoding algorithm for tail-biting convolutional codes.
- Simulated SPA, min-sum decoding algorithms for QC-LDPC codes.
- Defended thesis on this project.

The Study of Classifier Based on Machine Learning   *XJTU, China*
Undergraduate researcher   *Sept 2020 - Dec 2020*
- Processed raw data and visualized, and reduced data dimension using PCA, t-SNE and UMAP algorithms.
- Classified the data using Classification Tree, SVM, kNN, and Keras of TensorFlow.

Work Experience

Error Correct Coding for Data Storage   *SRAT group, UCSD*
Research Assistant   *April 2023 - June 2023*
- Complete unfinished work in Local Global Polar Codes, such as implementation in higher code rate.

LDPC Decoder Quantization for NAND Flash Channel *Marvell Technology, California*

Intern researcher *June 2022 - Sept 2022*

- Worked on finding better dynamic quantization algorithms for LDPC codes used in NAND Flash.
- Quantize functions are determined by fitting with probability distribution in each decode iterations.
- Greater emphasis on small LLRs.

Beijing Qing Hang Zi Jing Equipment Technology Co., Ltd *Beijing, China*

Intern *Aug 2019 - Sept 2019*

- Learned auto-control theories and simulated via HTML, CSS.
- Designed a UAV apron.

Leadership and Community Service Experience

Student Union *Xi'an Jiaotong University, China*

Head of a department of 30 members *Sept 2017 - June 2019*

- Organized student activities.
- Sought for sponsorship out of school.

Skills and interests

Programming Matlab, Python, C/C++, HTML/CSS

Language Mandarin, English

Interests All kind of sports, Video games