XIANG(SHAWN) GAO

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EDUCATION

Master of Science in Electrical and Computer Engineering | UC San Diego **Jan 24' - Dec 25'**

- **Relevant Course:** Digital Signal/Image Processing, Modern Communication Networks, MIMO systems, Principles of Wireless Networks, Filter Banks and Wavelets, Data Analysis and Statistical Learning, Visual Learning, ML for Physical Applications, GPU Programming, Linear Algebra and Application, Search and Optimization. | 3.96/4.00 GPA.

Bachelor of Engineering in Communication Engineering | Tianjin University **Sep 18' - Jun 22'**

- **Relevant Course:** Communication Principles, Mobile Communication, Information Theory and Coding, Microwave Technology, Optical Fiber Communication, FPGA Design, Electromagnetic Field and Electromagnetic Waves, High Frequency Electronic Circuit, Edge Computing Communication. | **Honor**: Outstanding Graduate Award.

TECHNICAL SKILLS

Programming Languages: Python, Matlab, VHDL, Verilog, FPGA, C++, Perl, HTML/CSS, Shell/Bash.
Tools & Frameworks: Git, Docker, Tensorflow, Pytorch, GNU Radio, USRP, Vivado, Quartus, Hadoop, SQL Server.
Wireless Communication: 5G NR, LTE, IEEE 802.11 standards, Bluetooth LE, OFDM, mmWave, MIMO, Zigbee.

RELEVANT WORK EXPERIENCE

4G/5G Baseband & Network Verification Engineer | Integration & Verification Team, Ericsson **Sept 22' - Sept 23'**

- Verified and validated Ericsson 4G/5G transport products, ensuring high-quality deliverables.
- Designed and maintained verification environments for both hardware and software.
- Developed, executed and debugged system-level automated and manual test cases for Baseband, Router, and Switch products, ensuring LTE Carrier Aggregation(CA) functionality, stability, protocol compliance, and regression robustness.
- Designed and optimized automation test frameworks, improving regression test efficiency with Java and Perl scripts.
- Investigated and resolved global customer issues, enhancing system stability and reliability.

RELEVANT PROJECTS

Hybrid Data-Driven mmWave Network Performance Prediction via DRL **Winter 2024**

- Proposed DDS, an innovative hybrid simulator leveraging Deep Reinforcement Learning (DRL) and PHY/MAC layer modeling to precisely forecast throughput distributions in dense mmWave networks, effectively mitigating simulation-to-reality gaps.
- Engineered a DRL-based parameter tuning system incorporating Convolutional Neural Networks (CNNs) to extract spatial features from per-beam Received Signal Strength (RSS), enhancing adaptability to dynamic wireless environments and achieving superior prediction accuracy (average KL divergence: 0.14).
- Validated performance on a custom mmWave testbed with MikroTik wAP 60G×3 IEEE 802.11ad routers (OpenWrt + custom firmware for fine-grained beam-level RSS capture) and ASUS RT-AC86U backbone router for centralized control, achieving 18.2 Mbps average throughput prediction error—outperforming baselines in dense deployment scenarios.

Energy-Efficient Asymmetric Communication for Sustainable IoT Devices **Spring 2024**

- Developed an asymmetric communication approach using the SlimWifi concept to significantly reduce IoT communication energy consumption, enhancing sustainability.
- Simulated energy-efficient OOK signal transmission with Matlab and validated channel performance using USRP devices, optimizing energy efficiency in signal transmission.
- Implemented OFDM demodulation for efficient bit sequence integration into MAC payloads and employed machine learning for precise signal processing at the MAC layer, focusing on minimizing power usage.
- Achieved potential energy reduction in signal transmission from tens or hundreds of milliwatts to approximately 100 microwatts, while maintaining signal integrity and quality.

Adaptive Subband Kalman Filtering for Acoustic Echo Cancellation **Fall 2024**

- Developed a subband Kalman filtering (SB-KF) algorithm to enhance real-time acoustic echo cancellation, improving speech clarity while optimizing computational efficiency through subband processing.
- Achieved a 35% reduction in residual echo energy and a 5.2 dB gain in Echo Return Loss Enhancement (ERLE) compared to traditional full-band filters, reducing processing time by 67.5%, making it suitable for real-time, low-latency applications.

Intelligent Workshop Production Call System **Fall 2021**

- Supervised and managed team members to design and program the embedded software of an Intelligent Call System, enhancing factory machinery repair efficiency.
- Engineered the core program in C and successfully ported various modules, including the RC522 RF module, to the STM32 microcontroller. Integrated Wi-Fi remote calling functionality and developed a fully functional physical prototype.