# 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

**Radio Frequency Testing Engineer** | Wireless WWAN Team, UL Solution **May 25' - Present**

- Perform Conducted and Radiated tests of wireless technologies such as WWAN, Bluetooth, and Wi-Fi in anechoic chambers, ensuring compliance with FCC, ANSI, and other regulatory standards.
- Set up and adapt test equipment based on project requirements for 4G LTE, 5G, WCDMA, and GSM compliance testing.
- Operate RF instruments including CMW-500 and PXA Spectrum Analyzer; troubleshoot hardware issues as needed.
- Conduct and report measurements on Frequency Stability, EM, CSE, OWB, SAR, and WWAN radiated power.

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

- Validated Ericsson 4G/5G transport products, focusing on LTE Carrier Aggregation (CA), stability, and protocol compliance.
- Built and maintained automated and manual test environments across hardware/software layers using Java and Perl.
- Designed regression frameworks that improved testing efficiency and coverage across Baseband, Router, and Switch systems.
- Collaborated with global teams to troubleshoot field-reported issues, enhancing system robustness and performance.

## RELEVANT PROJECTS

**Hybrid mmWave Network Prediction with DRL + CNN** **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.

**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.