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, Filter Banks and Wavelets, Data Analysis and Statistical Learning, Visual Learning, GPU Programming, Linear Algebra and Application. | 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.

Search Algorithm Engineer Intern | Growth Strategy Department, Baidu **Jun 22' - Sept 22'**

- Responsible for the R&D of basic strategies related to anti-cheating search engines on mobile and PC terminals.
- Using the Hadoop framework to mine, identify, and classify mass web resources based on big data and help users get effective network information when searching the internet.
- Iterated multiple anti-cheating strategies, familiar with the whole process of case solution using python and shell scripts.

RELEVANT PROJECTS

Automated Network Configuration for 5G IAB Driven by RL **Winter 2024**

- Developed a Reinforcement Learning(RL) framework for 5G Integrated Access and Backhaul(IAB) networks, using Kernel Density Estimation (KDE) for data-driven stochastic simulation, improving backhaul reliability by 10% and bridging the simulation-to-reality gap.
- Implemented a piecewise multi-objective reward shaping mechanism, optimizing multiple network slice goals simultaneously, achieving 32x faster convergence without extensive hyperparameter tuning.
- Validated the framework using a custom-built mmWave IAB testbed with 60 GHz radios and a large-scale 3D ray tracing simulation environment, demonstrating substantial improvements in multi-objective optimization, power management, and scalability of 5G IAB networks.

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.