Henry Leou

Open to Relocation | US Citizen | LinkedIn: https://www.linkedin.com/in/henry-leou-746731146/ **GitHub:** https://github.com/henryleou
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TECHNICAL SKILLS

Programming Languages: Python, C, Java, R, SQL, MATLAB, Ruby on Rails, C++
SW Tools & Debugging: Wireshark, tcpdump, QXDM, QCAT, trace32, adb logcat, git, Jenkins (CI/CD), pytest, unittest
Embedded / 3GPP Wireless: LTE, NR 5G, IMS (VoLTE, VoWiFi, VoNR), TCP/IP stack, NAS, RRC, PDCP, MAC, PHY
Libraries: Pandas, NumPy, SciPy, Matplotlib, Scikit learn, Pytorch, OpenCV, TensorFlow
Signal Processing Domain: FFT, Wavelet Transform, Bilateral Filtering, Quantization, PSNR Optimization, Image Processing

WORK EXPERIENCE

Senior Software Engineer @ Qualcomm

- **Cellular Modem Software Protocol Team – Python, C++, C** Sept **2020 – Present**
  - Collaborated with **PHY/RF** engineering teams to analyze signal processing behavior in **LTE/NR5G** modem chains
  - Created and maintained backend test infrastructure on Linux using **Keysight UXM** and custom **C** and **Python** scripts to support continuous integration pipelines
  - Debugged modem protocol layers (**PDCP**, **RLC**, **IMS**) and resolved **VoNR/VoWiFi/VoLTE** call flow issues using **QXDM**, **QCAT**, **tcpdump**, and **trace32** logs
  - Utilized **Python** and **MATLAB** for debugging modem audio paths and **VoIP** call audio issues specifically for analyzing **RTP** packets
  - Developed and maintained backend scripts for Linux-based testing infrastructure using Keysight **UXM** APIs and Qualcomm HW modules
  - Collaborated with hardware and **PHY** teams to validate signal chain performance; performed log parsing and large-scale data analysis in Python
  - Integrated modem testing into internal **CI** workflows for **regression testing** and log analysis
  - Proficient understanding in internet protocol such as **TCP/IP** and using **Wireshark** for **tcpdump** debugging
  - Proficient understanding of modem protocol **NR5G** and **LTE PHY L1**
  - Focused in debugging modem **IMS VoIP** such as **VoLTE/VoWIFI/VoNR** call related issues
  - Filed a **patent IDF** in enhancing **emergency 911** call protocol
  - Participated in algorithm design and development of **3GPP VoIP** call design and optimization
  - 4+ years of experience in North America operator conformance lab (**VZW, TMO, ATT**) test cases
  - 4+ years of experience in debugging **PTCRB** and **GCF** conformance test cases
  - 4+ experience in debugging call boxes such as **R&S CMW 500** and **Keysight UXM**

Undergraduate Student Researcher @ UC Berkeley Institute of Transportation Studies (Mobile Sensing Lab)

- Project: Deep Learning Truck Vehicles **– Python, C, MATLAB** June **2019** – December **2019**
  - Worked in a team of 4 and personally responsible for **back-end development**, optimizing machine learning algorithms, and **data analysis**
    - Performed **EDA** on multiple raw data sets collected from a Volvo truck vehicle by using **C** and **Python** libraries such as **pandas**
    - Generated highway road elevation dataset and plots using Python, **MATLAB** and **Google Road elevation API** in order to optimize the simulations and run tests on the autonomous truck vehicles

EDUCATION

University of California, Berkeley — *B.A. in Data Science & B.A. in Applied Mathematics*
Domain Emphasis: Applied Mathematics & Modeling (Data Science)
Domain: Electrical Engineering & Computer Science (Applied Mathematics)
Courses: Machine Learning, Data Structures, Algorithms, Java, Python, Databases, Digital Signal Processing, Signals & Systems

HIGHLIGHTED PROJECTS

Video Compression with Embedded Channel Optimization (**Best Demo Award**) - **MATLAB, Python, C** April **2019**

- Designed and implemented a video compression pipeline using **wavelet transform** (DB-4), FFT-based down sampling, and quantization in MATLAB
- Developed post-processing techniques including bilateral filtering to improve compression **PSNR** by up to 3dB over baseline
- Modified **AX.25** communication protocol's digipeater field to increase transmission efficiency by reducing overhead 20+ bytes per packet
- Achieved final compressed file size of ~6.1KB at 24dB **PSNR**, improving baseline quality while reducing bandwidth
- Demonstrated understanding of **transform coding**, **quantization**, **signal reconstruction**, embedded protocol optimization

Automated Blackjack Dealer Using Baxter **- Python** December **2019**

- Implemented inverse kinematics with the MoveIt package to perform motion planning for card manipulation
  - Movements for both arms were parallelized for efficiency
- Using techniques similar to CV Homography technique to build card classifier for playing cards recognition

Convolutional Neural Networks (CNNs) **- Python** April **2019**

- Built a CNN that classifies movements based on a single key frame as input
  - Created multiple model architectures and plotted a training, validation loss curves, confusion matrices to evaluate the best CNN trained