DIJIE ZHU

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Education

M.S. **University of California, Los Angeles (UCLA)** Sep 2024 – Present
Electrical and Computer Engineering GPA: 3.957/4.0

- Major courses: Neural Network and Deep Learning (A+), Advanced Neural Network and Deep Learning (A), Computational Robotics (A), Modern Wireless Communication Systems (A), Large Scale Data Mining (A), Statistical Machine Learning (A-), Digital Communication System (A).

B.Eng. **University of Electronic Science and Technology of China & University of Glasgow** Sep 2020 – Jun 2024
Electrical and Electronic Engineering (Joint Programme) First Class Honours (UK) GPA: 3.9/4.0 Rank: 3/169

- Major courses: Microelectronic Systems (99), Circuit Analysis and Design (95), Signals and Systems (95), Communications Networks (84), AI and Machine Learning (95), Digital Circuit Design (86).

Research Experience

Dynamic Threshold Adjustment and Novel Pseudo-Labeling Methods Mar 2025 – Present
Instructor: Suhas Diggavi, UCLA Semi-Supervised Learning
Coding Language: Python

- Followed Consistency Regularization and Pseudo-Label in SSL as base model.
- Developed a model training estimator without resorting to train or test accuracy.
- Designed a interpolation dynamic thresholding method based on estimator, Freematch SAT and data sample statistics.
- Surpassed SOTA on CIFAR10 with tatal 10 labels given.
- Achieved Fast converging speed and better final performance with WideResnet.

NN-Aided Digital SIC under Time-Varying Channels Sep 2024 – Jan 2025
Instructor: Ian Roberts, UCLA Neural Network, Signal Processing, Communication Systems
Coding Language: MATLAB, Python

- Implemented an MLP-based neural network in MATLAB for digital SIC in IBFD systems under time-varying channels, solving an inverse channel-estimation problem.
- Engineered linear preprocessing features to encode channel dynamics without frame-wise retraining, reducing computational complexity by $\sim 75\%$.
- Conducted physics-based simulations with Jakes' fading model; achieved mean SIC gain of $6.93\,\mathrm{dB}$ with variance $1.21\,\mathrm{dB}^2$.
- Benchmarked against adaptive memory-polynomial and residual NN methods; demonstrated superior stability (variance $\downarrow 30\times$) and real-time feasibility.

CNN-Based Real-Time Street Photo Multi-Target Segmentation Dec 2022 – Feb 2023
Instructor: Alexander Amini, MIT Computer Vision, Machine Learning
Coding Language: Python

- Developed a custom PyTorch DataLoader pipeline for efficient preprocessing, augmentation, and batching to support real-time segmentation inference.
- Architected and implemented a convolutional neural network with optimized layer dimensions and skip connections for simultaneous multi-object detection and seg-

mentation.

- Integrated aleatoric and epistemic uncertainty estimation to quantify model confidence and guide selective data acquisition.
- Achieved 95% training accuracy and 90% evaluation accuracy, earning a final project score of 93/100.

5.5G to 6G IBFD System Simulation: Three-Stage SI Cancellation Techniques Sep 2023 – Jun 2024
Instructor: Ying Liu, UESTC Signal Processing, Communication Systems
Coding Language: MATLAB, Python

- Simulated horn-antenna rotation ($0^\circ \rightarrow 90^\circ$) under a 3GPP CDL channel, achieving $35\,\mathrm{dB}$ directional isolation $+\,47\,\mathrm{dB}$ path-loss (total $\approx 82\,\mathrm{dB}$ passive SIC).
- Designed a two-tap FIR cancellation network targeting the direct path and strongest reflection, realizing $\approx 30\,\mathrm{dB}$ suppression pre-ADC via adaptive analog filtering.
- Applied a modified variable-step LMS algorithm ($\alpha = 10$, $\beta = 0.02$, $m = 3$, 15-tap FIR) to cancel residual interference, adding $\approx 5\,\mathrm{dB}$ and achieving $\approx 117\,\mathrm{dB}$ end-to-end SIC.

Autonomous Mobile Robot: Multi-Environment Task Fulfillment Mar 2023 – Jun 2023
Instructor: Abdullah Al-Khalidi, UESTC & Glasgow Embedded Systems, Control, Computer Vision, Communication Systems
Coding Language: C/C++, Python

- Coordinated a team of 10 students; designed and assembled the robotic vehicle's mechanical, communication, vision, and control modules.
- Implemented HC-12 wireless link for real-time data exchange with the host PC.
- Achieved smooth navigation and decision execution through EMA filtering, YOLOv3, and PID integration.
- Validated performance in multiple environments, achieving 95% average task completion and a project score of 92/100.

Publications

Digital Nonlinearity Cancellation Architecture Based on An Auxiliary Transmit Antenna Array Jun 2023
Fang Nan, Nanxi Li, **Dijie Zhu**, Yuetian Zhou, Sujie Dai, Jianchi Zhu, Jinlong Tian, Xiaoming She. *ITCC'23: Proceedings of the 2023 5th International Conference on Information Technology and Computer Communications*, pp. 32–37. DOI: 10.1145/3606843.3606849

A Post-Correction Method for Terahertz Nonlinear Distortion with Dual-Band Carrier Aggregation Oct 2022
Mengyao Zhang, Jian Liu, **Dijie Zhu**, Xin Quan, Qiang Xu, Ying Liu, Zhi Chen. *2022 IEEE Globecom Workshops: Sixth IEEE International Workshop on Terahertz Communications*.

Improved Almost Blank Subframe Technology with Cooperative Interference Suppression Mar 2023
Cong Chen, Zixuan Long, Fang Nan, Luyao Xiao, **Dijie Zhu**, Xiang Li, Ying Liu, Shihai Shao. *International Journal of Numerical Modelling: Electronic Networks, Devices, and Fields*.

Technical Strengths

Programming Languages C/C++, Python, MATLAB, Vivado
ML Inference & Serialization PyTorch, TensorFlow **Other Tools** Git, Jupyter