CHENYE YANG

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For more information, please visit my website at *yangchenye.com*

EDUCATION

University of California, Davis - United States   *Sep 2022 - present*
Ph.D. Candidate in Electrical and Computer Engineering   **Degree GPA: 3.87/4.0**

Columbia University - United States   *Sep 2019 - Apr 2021*
M.S. Advanced Research Specialization in Electrical Engineering   **GPA: 3.8/4.0**
Nikola Tesla Electrical Engineering Scholarship

Xi'an Jiaotong University - China   *Sep 2015 - Jun 2019*
B.Eng. in Automation   **Grade: 89.42/100**
Honors Electronic and Information Engineering Program (QianXuesen Class)

RESEARCH EXPERIENCES

Robustness of Reinforcement Learning   *Prof. Lifeng Lai, UC Davis, May 2025 - present*
Graduate Student Researcher in Lai's group.
- Research on reward and action robustness of reinforcement learning algorithms.

Preference Robustness of RLHF   *Prof. Lifeng Lai, UC Davis, Dec 2023 - May 2025*
Graduate Student Researcher in Lai's group.
- Research on mathematical theory of Reinforcement Learning from Human Feedback (RLHF).
- Investigate preference attacks on RLHF algorithms with online human feedback.
- Propose attack strategy on RLHF framework and corresponding defense mechanism against attacks with bounded attack cost, and analyze their performance.

Reward Robustness of Bandit   *Prof. Lifeng Lai, UC Davis, Sep 2022 - Feb 2024*
Graduate Student Researcher in Lai's group.
- Research on mathematical theory of Bandit problem.
- Publications accepted by ACSSC 2023 and IEEE Transactions on Signal Processing.
- Investigate rewards attacks on stochastic multi-armed bandit algorithms with non-stationary environment.
- Design attack strategies for three increasingly general scenarios, and analyze their performance.
- Propose defense mechanism against adversarial attacks with bounded attack cost, and analyze its effectiveness.

Edge AI System for Smart Home   *Prof. Xiaofan (Fred) Jiang, Columbia University, Jun 2021 - Sep 2021*
Summer Research Assistant in Columbia Intelligent and Connected Systems Lab.
- A system able to auto-discover the sensors connected to it and allocate sensor and actuator resources according to the smart home applications users specified, deployed in multiple lab rooms.
- Survey on current Edge AI systems and Digital Twin (DT) representation, and design our own system architecture from MCU and sensor hardware to user application. Build the testbed from scratch.

Fever Screening System   *Prof. Xiaofan (Fred) Jiang, Columbia University, Jan 2020 - May 2021*
Research Intern in Columbia Intelligent and Connected Systems Lab.
- A low-cost system based on RGB-thermal camera for continuous fever screening of multiple people without human interaction, deployed in a restaurant and hospital clinic in New York City.
- Investigate solutions. Match multiple RGB and thermal heads, train and deploy YOLOV3 (head detection) and FSA-Net (head orientation regression), estimate distance using non-identical RGB and thermal camera, etc. Write paper.
- Publications accepted by SenSys 2020 Poster, CPHS 2021, and IPSN 2022. Columbia news. Project website.

Khameleon Scheduler in Reinforcement Learning   *Prof. Eugene Wu, Columbia University, Jul 2020 - Sep 2020*
Research Intern in WuLab Columbia University.
- The server-side scheduler involves a complex optimization based on available resources, predicted user interactions, and response quality levels to maximize user-perceived interactivity in real-time.
- Create the simulated RL environment, write Q-Learning and SARSA based prefetching scheduler to trade off latency for response quality with the progressive encoded response in cloud-based interactive applications.

Optimization of Integrated Optics   *Prof. Xiaoqi Zhou, Sun Yat-Sen University, Feb 2019 - Jun 2019*
Undergraduate Thesis. Research Intern in Optical Quantum Information Lab.
- Design numerical methods to solve optimal parameters of grating coupler based on regression analysis and constrained optimization problem. Conduct simulation experiment with one-dimensional grating coupler.

Cyber-Physical Energy Systems   *Prof. Jiang Wu, Xi'an Jiaotong University, Oct 2017 - Feb 2019*
Member of XJTU Information-technology Talent Program.
Research Intern in Ministry of Education Key Lab for Intelligent Networks and Network Security.
- Propose centralized K-means algorithm, using weighted combination of features from PCA and prior knowledge. Expand it to distributed cases, using parameter consensus and feature transferring method.
- Write centralized & distributed K-means clustering algorithms for massive data on energy demand side. Analyze the results obtained from the power system in a city. Write paper.
- Two papers written and one accepted by Chinese Control Conference 2018.

PUBLICATIONS

- **Chenye Yang**, Guanlin Liu, Lifeng Lai, "Stochastic Bandits With Non-Stationary Rewards: Reward Attack and Defense" *IEEE Transactions on Signal Processing 2024*.
- **Chenye Yang**, Guanlin Liu, Lifeng Lai, "Reward Attack on Stochastic Bandits with Non-stationary Rewards" *ACSSC 2023*.
- Kaiyuan Hou, Yanchen Liu, Peter Wei, **Chenye Yang**, Hengjiu Kang, Stephen Xia, Teresa Spada, Andrew Rundle, Xiaofan Jiang, "A Low-Cost In-situ System for Continuous Multi-Person Fever Screening" *IPSN 2022*.
- Stephen Xia, Rishikanth Chandrasekaran, Yanchen Liu, **Chenye Yang**, Tajana Simunic Rosing, Xiaofan Jiang, "Demo Abstract: A Drone-based System for Intelligent and Autonomous Homes" *SenSys 2021 Best Demo Award*.
- Peter Wei, Yanchen Liu, Hengjiu Kang, **Chenye Yang**, Xiaofan Jiang, "A Low-Cost and Scalable Personalized Thermal Comfort Estimation System in Indoor Environments" *CPHS 2021*.
- Peter Wei, **Chenye Yang**, Xiaofan Jiang, "Poster Abstract: Low-Cost Multi-Person Continuous Skin Temperature Sensing System for Fever Detection" *SenSys 2020 Poster*.
- Pengyuan Liu, **Chenye Yang**, Jiang Wu, "Hybrid Features Based K-means Clustering Algorithm for Use in Electricity Customer Load Pattern Analysis" *Chinese Control Conference 2018*.

PROJECTS & TEACHING EXPERIENCES

Course projects:	Internet of Things, Large Scale Stream Processing, Sparse Models for High-D Data, Statistical Learning, Random Matrix Theory, Systems on Chip, Error Correcting Code
Teaching:	Ph.D. Teaching Assistant for EEC 256 - Reinforcement Learning in Spring 2025
	Ph.D. Teaching Assistant for ENG 006 - Engineering Problem Solving in Winter 2025
	Ph.D. Teaching Assistant for EEC 173A / ECS 152A - Computer Networks in Winter 2024
	Ph.D. Teaching Assistant for EEC 173A / ECS 152A - Computer Networks in Winter 2023
	M.S. Teaching Assistant for E4764 IoT - Intelligent and Connected Systems in Fall 2020

Error Correcting Code   *Prof. Ulrich Jetzek (from Fachhochschule Kiel), UC Davis, Apr 2023 - Jun 2023*
- Read TXT, PNG and WAV to bit-stream. Encode with (7,4) Hamming Code and (n, k) Systematic Cyclic Code.
- Pass Binary Symmetric Channel. Decode with Syndrome and Error Trapping Decoder. Reconstruct file then analyze.

Large Scale Stream Processing   *Prof. Deepak S. Turaga, Columbia University, Jan 2020 - May 2020*
- Create data generator and stream processor with python multi-threads, database and website for storage and control.
- Design the socket and HTTP data communication, and websocket control communication between each part.

Sparse Models for High-Dimensional Data   *Prof. John Wright, Columbia University, Jan 2020 - May 2020*
- A system able to fast detect moving objects in high-resolution video. Tested on a sport video and daily scenario.
- Super-resolution reconstruction of video frame is used to make processing fast while keeping a high-res video.

Internet of Things   *Prof. Xiaofan (Fred) Jiang, Columbia University, Sep 2019 - Dec 2019*
- Program ESP8266 to deal with IO, work with APIs, run as server, connect to MongoDB and recognize gesture.
- Design a distributed scalable system to measure soil conditions over long duration at multiple locations via LoRa wireless communication. Data is stored in MongoDB. A website is built for data visualization and systems control.

Statistical Learning   *Prof. Predrag Jelenkovic, Columbia University, Sep 2019 - Dec 2019*
- Reproduce the results about identification and authentication in *Smartphone and Smartwatch-Based Biometrics Using*

Activities of Daily Living with *WISDM Dataset* using Decision Tree, Random Forest and K-NN.
- Conduct Support Vector Machine on the same dataset and compare different methods.

Random Matrix Theory and Application *Prof. Ori Shental, Columbia University, Sep 2019 - Dec 2019*
- Reproduce the conclusions with uniform samples in *Bandlimited Field Reconstruction for Wireless Sensor Networks*.
- Experiment on Gaussian distribution of sampling and discuss the difference.
- Point out the problem of insufficient evidence for a conclusion in the paper.

INTERNSHIP EXPERIENCE

WiLO Networks Inc., California US *Network Engineer Intern* *Oct 2021 - Apr 2022*
Responsible for smart farm prototype development and testing.
· **Network**
- Build a mesh network based on LoRa PHY with ESP32 board + LoRa SX1276 chip for low-cost smart agriculture.
- Work with MCCI LoRaWAN LMIC Library to realize the register level operating mode transition, interruption and data Tx Rx and CAD sequence of SX1276, and OS.Job level communication timing of ESP32.
- Design the LoRa protocol between gateway and multiple nodes. Propose strategies to ensure the auto-initialization and the long-term robustness of mesh network. Implement field test in Duke Smart Farm and simulation in NS-3.
- Investigate mesh for LoRa PHY network.
· **Cloud & ML**
- Implement the data flow from sensors to microcontroller to cloud. Use Azure InfluxDB to do data fusion and ML.
· **Hardware**
- Design and build the PCB for back-scatter tag. Choose components and design PCB layout.
· **Other**
- Organize and standardize WiLOLoRa.lib and WiLOSensors.lib to support the operating of LoRa mesh network and interfacing of multiple sensors and code reuse. Create KiCad schematic library and footprint library for PCB design.

TECHNICAL SKILLS

Programming:	Python, C/C++/SystemC, Matlab, HTML, R, VerilogHDL
Software & Tools:	**Design:** KiCad, Autodesk Inventor, Altium Designer, LabVIEW, FDTD Solutions
	Platform: VS Code, PlatformIO, etc
	Others: GitHub, Linux, NS-3, LaTeX, Docker, PyTorch, OpenCV, Spark, AWS, GCP

AWARD

- Columbia University: Nikola Tesla Scholarship	*Sep 2019*
- Xi'an Jiaotong Univeristy Third Scholarship	*Dec 2018*
- Xi'an Jiaotong Univeristy Siyuan Scholarship	*Oct 2017*
- Xi'an Jiaotong Univeristy Outstanding Student	*Oct 2017*
- First Prize in China Undergraduate Mathematical Contest in Modeling, Provincial	*Dec 2016*
- Second Prize in VEX Robotics China Open, National	*Dec 2016*