

Ron (Rongyu) Lin, Ph.D., MBA

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PROFESSIONAL EXPERIENCE

Quinnipiac University , Hamden, CT Assistant Professor (Tenure-Track), Department of Computer Science	2025-Current
Clark University , Worcester, MA Visiting Assistant Professor, Department of Computer Science	2024-2025
Capital One Financial Corporation , Plano, TX Principal Data Scientist	2022-2024
• Built and maintained valuation models for the auto loan portfolio to estimate the value of auto loans. • Developed machine learning models forecasting borrower prepayment, default and loss behavior as inputs to auto loan valuation. • Monitored model performance and communicated valuation results to business and risk stakeholders.	

EDUCATION

Johns Hopkins University , Baltimore, MD Doctoral Student, Doctor of Education	2023-Current
King Abdullah University of Science and Technology , Thuwal, Saudi Arabia Ph.D. in Electrical and Computer Engineering Supervisor: Prof. Xiaohang Li; Co-Supervisor: Prof. Xiangliang Zhang Dissertation: Wide Bandgap Semiconductor Device Design via Machine Learning	2018-2022
Santa Clara University , Santa Clara, CA Master in Business Administration Concentration: Data Science and Business Analytics Concentration	2020-2023
Emory University , Atlanta, GA Doctoral Student, Ph.D. in Physics	2017-2018
Southern University of Science and Technology , Shenzhen, China Bachelor of Science in Physics	2013-2017

RESEARCH INTERESTS

My research develops artificial intelligence methods for scientific discovery, with semiconductor materials and devices as the central application. Beyond semiconductors, my research also spans AI for healthcare, LLM multi-agent simulation of marketing and consumer behavior, and energy-efficient AI systems.

1. AI for Semiconductor Materials and Device Design

Machine learning and physics-based simulation for wide-bandgap semiconductor device design, including III-nitride tunnel junctions, AlGaIn deep-ultraviolet LEDs with superlattice electron-blocking layers, GaN/AlGaIn heterostructure transistors, and β -Ga₂O₃ thin films and photodetectors, combining TCAD simulation (Silvaco, APSYS, Sentaurus) with machine learning surrogate models. For two-dimensional materials, property prediction and first-principles calculation, automated identification of exfoliated flakes, and modeling of 2D memristors and graphene diodes. Current work develops multi-fidelity and LLM-agent frameworks that link atomic-scale prediction, device simulation, and experimental characterization for automated device design.

2. Multimodal AI for Medication and Drug Recommendation

Interpretable, multimodal models that combine patient records, molecular structure, and drug-drug interaction knowledge to recommend safe and effective medications, using heterogeneous representations and mixture-of-experts architectures.

3. LLM Multi-Agent Simulation for Marketing and Consumer Behavior

Generative agents that simulate consumer decisions, social interaction, and marketplace dynamics to test marketing strategies before deployment, including visual LLM agents for advertisement analysis and audits of how model choice changes simulation outcomes.

4. Energy-Efficient AI Systems

Reducing the energy consumption of foundation models and agentic AI across the stack, from hardware and system

architecture to agent orchestration and harness design, model fine-tuning, and smaller, more efficient models, together with benchmarks for evaluating agentic AI systems.

PUBLICATIONS

(* corresponding author)

1. Koushik Bhupathiraju, Ranjot S. Matharoo, Hellen W. Mwangi, Nirmal Hitendra Dagli, Alex Power, Moses O. Onsare, **Rongyu Lin*** and Taskin Kocak* "Energy-Efficient AI for Foundation Models: Algorithms, Hardware, and Data Center Infrastructure." *Computers* 15, no. 10 (2026): 660.
2. Morgan Montz, Eric May, Shawn Acheampong, Evan Vastakis, Chetan Jaiswal, Cameron LaMack, **Rongyu Lin*** "wRIST: Robotic Intermediate Sign Translator for Humanoid Robot Speech-to-Sign Language Translation," 2026 IEEE World AI IoT Congress (IEEE AIIoT), pp. 40-49, 2026
3. Man-Lin Chu, Tao Li, Wanxin Ye and **Rongyu Lin*** "MAVIS: A Visual LLM Multi-Agent System for Marketing Analysis of Advertisement Campaigns in an AI Village," 2026 IEEE International Conference on Intelligent Systems and Interdisciplinary Applications (IEEE ISAIA), 2026. Accepted.
4. Aban Khan, Man-Lin Chu, Taskin Kocak and **Rongyu Lin*** "Comparative Study of Feature Dimensionality and Model Capacity in Earthquake Forecasting," 2026 IEEE International Conference on Intelligent Systems and Interdisciplinary Applications (IEEE ISAIA), 2026. Accepted.
5. Nirmal Hitendra Dagli, Taskin Kocak, **Rongyu Lin** and Sanjeev Kumar Marimekala "HERO-S: QPU-Aware Energy-Latency Orchestration for AIoT Intrusion Detection," 2026 IEEE International Conference on Intelligent Systems and Interdisciplinary Applications (IEEE ISAIA), 2026. Accepted.
6. Toral Banerjee, **Rongyu Lin***, Mengyuan Shi "Don't train medical AI on patients' data without their knowledge" *Nature* 644.8075 (2025): 42.
7. Yuan Yan, Yimu Yang, Yinchang Ma, Kadin Reed, Shengzhi Li, Shichao Pei, Zhenwen Liang, Xixiang Zhang, Yi Wan, Xiangliang Zhang and **Rongyu Lin*** "Machine Learning for 2D Material-Based Devices." *Materials Science and Engineering: R: Reports*, 166 (2025): 101085. (**Impact Factor = 31.6**)
8. Man-Lin Chu, Lucian Terhorst, Kadin Reed, Tom Ni, Weiwei Chen, and **Rongyu Lin***. "LLM-Based Multi-Agent System for Simulating and Analyzing Marketing and Consumer Behavior." 2025 IEEE International Conference on E-Business Engineering (IEEE ICEBE), Buraydah, Saudi Arabia (2025): 72-79.
9. Shengzhi Li, **Rongyu Lin** and Shichao Pei. "Multi-modal preference alignment remedies degradation of visual instruction tuning on language models." *ACL* 2024.
10. Zhiyuan Liu, Yi Lu, Haicheng Cao, Raul Aguilera Vazquez, **Rongyu Lin**, Na Xiao, Xiao Tang, Mingtao Nong, Shutu Li, Tingang Liu and Xiaohang Li "Multi-wavelength and broadband AlGaIn-based LED for versatile and artificial UV light source." *Micro and Nanostructures* (2024): 207755.
11. Shengzhi Li, Kittipat Kampa, **Rongyu Lin**, Bohang Li, Shichao Pei "Abstract2Appendix: Academic Reviews Enhance LLM Long-Context Capabilities" arXiv preprint arXiv:2411.05232.
12. Yinchang Ma, Yuan Yan, Linqi Luo, Sebastian Pazos, Chenhui Zhang, Xiang Lv, Maolin Chen, Chen Liu, Yizhou Wang, Aitian Chen, Yan Li, Dongxing Zheng, **Rongyu Lin**, Hanin Algaidi, Minglei Sun, Jefferson Zhe Liu, Shaobo Tu, Husam N Alshareef, Cheng Gong, Mario Lanza, Fei Xue, Xixiang Zhang. "High-performance van der Waals antiferroelectric CuCrP2S6-based memristors." *Nature Communications* 14, no. 1 (2023): 7891.
13. Chuanju Wang, Feras AlQatari, Vishal Khandelwal, **Rongyu Lin**, and Xiaohang Li. "Origin of interfacial charges of Al2O3/Si and Al2O3/GaN heterogeneous heterostructures." *Applied Surface Science* 608 (2023): 155099.
14. Xiao Tang, Yi Lu, **Rongyu Lin**, Che-Hao Liao, Yue Zhao, Kuang-Hui Li, Na Xiao, Haicheng Cao, Weyan Babatani, and Xiaohang Li. "Flexible self-powered DUV photodetectors with high responsivity utilizing Ga2O3/NiO heterostructure on buffered Hastelloy substrates." *Applied Physics Letters* 122, no. 12 (2023).
15. **Rongyu Lin**, Zhiyuan Liu, Peng Han, Ronghui Lin, Yi Lu, Haicheng Cao, Xiao Tang et al. "A machine learning study on superlattice electron blocking layer design for AlGaIn deep ultraviolet light-emitting diodes using the stacked XGBoost/LightGBM algorithm." *Journal of Materials Chemistry C* 10, no. 46 (2022): 17602-17610.
16. **Rongyu Lin**, Peng Han, Yue Wang, Ronghui Lin, Yi Lu, Zhiyuan Liu, Xiangliang Zhang, and Xiaohang Li. "Low Resistance Asymmetric III-Nitride Tunnel Junctions Designed by Machine Learning." *Nanomaterials* 11, no. 10 (2021): 2466.
17. Wen Gu, Yi Lu, **Rongyu Lin**, Wenzhe Guo, Zihui Zhang, Jae-Hyun Ryou, Jianchang Yan, Junxi Wang, Jinmin Li, and Xiaohang Li. "BAIN for III-nitride UV light-emitting diodes: undoped electron blocking layer." *Journal of Physics D: Applied Physics* 54, no. 17 (2021): 175104.

18. Zhiyuan Liu, Yi Lu, Yue Wang, **Rongyu Lin**, Chenxin Xiong, and Xiaohang Li. "Polarization modulation at last quantum barrier for high efficiency AlGaIn-based UV LED." IEEE Photonics Journal 14, no. 1 (2021): 1-8.
19. Maocheng Shan, Yi Zhang, Ming Tian, **Rongyu Lin**, Jie'an Jiang, Zhihua Zheng, Yongming Zhao et al. "Transverse Electric Lasing at a Record Short Wavelength 244.63 nm from GaN Quantum Wells with Weak Exciton Localization." ACS Photonics 8, no. 5 (2021): 1264-1270.
20. Xiao Tang, Kuang-Hui Li, Che-Hao Liao, Dongxing Zheng, Chen Liu, **Rongyu Lin**, Na Xiao, Shibin Krishna, Jose Tauboda, and Xiaohang Li. "Epitaxial growth of β -Ga₂O₃ (-201) thin film on four-fold symmetry CeO₂ (001) substrate for heterogeneous integrations." Journal of Materials Chemistry C 9, no. 44 (2021): 15868-15876.
21. Xiao Tang, Kuang-Hui Li, Yue Zhao, Yanxin Sui, Huili Liang, Zeng Liu, Che-Hao Liao, Wedyan Babatani, **Rongyu Lin**, Chuanju Wang, Yi Lu, Feras S. Alqatari, Zengxia Mei, Weihua Tang, Xiaohang Li. "Quasi-Epitaxial Growth of β -Ga₂O₃-Coated Wide Band Gap Semiconductor Tape for Flexible UV Photodetectors." ACS Applied Materials & Interfaces 14, no. 1 (2021):1304-1314.
22. **Rongyu Lin**, Xinwei Liu, Kaikai Liu, Yi Lu, Xinke Liu, and Xiaohang Li. "BAlN alloy for enhanced two-dimensional electron gas characteristics of GaN/AlGaIn heterostructures." Journal of Physics D: Applied Physics 53, no. 48 (2020): 48LT01.

Submitted Manuscripts

23. Haicheng Cao, Che-Hao Liao, Kuang-Hui Li, Kexin Ren, Khai D. Ngo, Mingtao Nong, Chee-Keong Tan, **Rongyu Lin**, Ying Wu, Martin Kuball, Xiao Tang, and Xiaohang Li. "Controlled Growth of 1.0- μ m-Thick β -Ga₂O₃ Films with Preferred (-201) Out-of-Plane Orientation via Substrate-Bias-Assisted Reactive Sputtering." Submitted to APL Materials.
24. Bertalan Beszédes, **Rongyu Lin**. "Comparison of Digital Spectral Sensors for Power LED Monitoring." Submitted to 2026 IEEE 18th International Scientific Conference on Informatics (IEEE Informatics'2026).
25. Nicholas D. Brown, Kruti P. Shah, Chetan Jaiswal, **Rongyu Lin**. "A Configuration-Driven Perception-to-Feedback Framework for Real-Time Navigation Assistance on Personal Mobile Hardware." Submitted to Universal Access in the Information Society.
26. Heng Wang, Zhang Li, Shiyi Tang, et al., **Rongyu Lin**, Atif Shamim, Khaled Nabil Salama. "Accelerating Graphene Geometric Diode Innovation: A Drift-Diffusion and Deep Neural Network Framework." Submitted to Nanoscale.

Manuscripts in Preparation

27. Tom Ni, Samar Khoso, Takuro Kawamura, Yajing Gu, Xiao Tang, **Rongyu Lin***. "Large Language Models for Semiconductor Manufacturing and Device Design: A Review." In preparation.
28. Weiwei Chen, Shengzhi LI, Shichao Pei, Mengyuan Shi, **Rongyu Lin*** "HERMES: Heterogeneous Representation and Multi-modal Expert Synthesis for Medication Recommendation." In preparation.
29. Weiwei Chen, Shengzhi LI, Shichao Pei, **Rongyu Lin*** "TRIXMED: Triage-Routed Mixture of Experts Framework for Interpretable Drug Recommendation" In preparation.
30. **Rongyu Lin**, Zhiyuan Liu, Xinyi Yan, Xiangliang Zhang and Xiaohang Li. "A systematic study on asymmetric AlGaIn graded tunnel junction by the machine learning framework" in preparation.
31. **Rongyu Lin***, Morgan Montz, Eric May, Shawn Acheampong, Evan Vastakis, Cameron LaMack, Chetan Jaiswal. "Gloss2Motion: Animating ASL Glosses into Robot Joint Trajectories." In preparation.
32. **Rongyu Lin***, et al. "Same Town, Different Configuration: Auditing a Frozen LLM Agent Market." In preparation.
33. **Rongyu Lin***, et al. "Stop or Pick? Decomposing First-Offer Bias in Agentic Marketplaces with Calibrated Decision Models." In preparation.
34. Ranjot S. Matharoo, **Rongyu Lin***, et al. "QBench: A Reproducible, Continuously-Running Benchmarking Platform for Coding-Agent Harnesses." In preparation.

PATENTS

1. **Rongyu Lin**, Liyuan Zhang, Xuance Jiang. "Automatic Retrieval System for Processing Micromechanically Exfoliated Two-Dimensional Materials." CN Patent 206906691 U (Application No. 201720454292.5), 2018.

CONFERENCE PRESENTATIONS AND POSTERS

1. **Rongyu Lin**, Zhiyuan Liu, Peng Han, Ronghui Lin, Yi Lu, Che-Hao Liao, Haicheng Cao, Xiangliang Zhang and Xiaohang Li "A machine learning study on superlattice electron blocking layer design for AlGaIn deep ultraviolet light-emitting diodes using the stacked XGBoost/LightGBM algorithm," IWUND 2023, Metz, France, June. 2023

2. **Rongyu Lin**, Zhiyuan Liu, Peng Han, Ronghui Lin, Yi Lu, Che-Hao Liao, Haicheng Cao, Xiangliang Zhang and Xiaohang Li “Machine learning design for UVC light-emitting diodes by stacked XGBoost/LightGBM,” IWN 2022, Berlin, Germany, Oct. 2022
3. **Rongyu Lin**, Peng Han, Yue Wang, Chenxin Xiong, Yi Lu, Xiangliang Zhang and Xiaohang Li “Low resistance III-nitride tunnel junction design based on machine learning,” SPIE Photonics West, San Francisco, United States, Feb. 2020
4. **Rongyu Lin**, Xinwei Liu, Kaikai Liu, Yi Lu, Xinke Liu and Xiaohang Li “AlGaIn/GaN Heterostructure Field-Effect Transistor with BAlN interlayer,” SPIE Photonics West, San Francisco, United States, Feb. 2020
5. Wen Gu, Yi Lu, **Rongyu Lin**, Wenzhe Guo, Jianchang Yan, Junxi Wang, Jinmin Li and Xiaohang Li, “High-performance UV LED with an undoped BAlN EBL,” SPIE Photonics West, San Francisco, United States, Feb. 2020
6. Chenxin Xiong, Yi Lu, Dongjun Qu, Xiangliang Zhang, **Rongyu Lin** and Xiaohang Li, “Quantum well prediction for III-nitride based deep-UV optoelectronics using machine learning,” SPIE Photonics West, San Francisco, United States, Feb. 2020

GRANTS AND DONATIONS

QU-OU Joint Research Grant (with Óbuda University): Energy-Optimized Adaptive Lighting System for Agriculture (\$25,000)	2026
Synopsys Sentaurus TCAD Donation: one-year academic license of Synopsys EDA software (Sentaurus TCAD and 200+ tools, 50 licenses each) through the Synopsys Academic & Research Alliances (SARA) program	2026
Claude Team Plan for Scientists, Anthropic (principal investigator verification approved)	2026

HONORS AND AWARDS

Bronze Tier Reviewer Distinction, IJCAI-ECAI 2026 Primary Paper Initiative	2026
Merit-based Scholarship, Johns Hopkins University	2023
Merit-based Scholarship, Santa Clara University	2020
Full scholarship for MS/PhD Study, KAUST	2018-2022
Summa Cum Laude Graduate, SUSTech - 1 out of 42 in Physics Department	2017
SUSTech Outstanding Student Scholarship	2016
Start-up and Innovative Full Scholarship from SUSTech	2013-2016
Physics experiment design competition, Guangdong Province, First Prize	2014

TEACHING INTERESTS

Machine Learning, Deep Learning, Generative AI, Python Programming, Scientific Computing, Optimization Methods, Algorithms, Data Structures, AI for Engineering Applications, Business Analytics

TEACHING EXPERIENCES

Courses

Quinnipiac University

Instructor CSC 352&552: Generative AI	Fall 2026
Instructor INF 605: Introduction to Python Programming	Fall 2026, Spring 2026 & Fall 2025
Instructor CSC 150: AI for Everyone / Elements of Artificial Intelligence	Fall 2026 & Spring 2026
Instructor INF 659: Probability & Data Analysis	Spring 2026
Instructor CSC 375&575: Generative AI	Fall 2025

Clark University

Instructor CSCI 120: Introduction to Computing	Fall 2024 & Spring 2025
Instructor CSCI 160: Algorithms	Fall 2024 & Spring 2025

King Abdullah University of Science and Technology

Graduate Teaching Assistant (TA) ECE390B: Special Topics in Photonics	Spring 2019
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Mentorship

Graduate Students

- Yajing Gu – Ph.D. Student, University of Bristol (Co-supervised with Dr. Xiao Tang)
- Ranjot Matharoo – Graduate Research Assistant, Quinnipiac University

- Hellen Wangari Mwangi – Graduate Research Assistant, Quinnipiac University
- Koushik Bhupathiraju – Graduate Research Assistant, Quinnipiac University
- Takuro Kawamura – Graduate Research Assistant, Quinnipiac University
- Aban Khan – Graduate Research Assistant, Quinnipiac University
- Mary Jacot – Independent Study Student (CSC 699), Quinnipiac University

Undergraduate Students

- Alex Power – Undergraduate Research Assistant, Quinnipiac University

Research Interns

- Weiwei Chen – Remote Research Intern (Co-mentored with Prof. Shichao Pei, UMass Boston)

Alumni

- Man-Lin Chu – Graduate Research Assistant, Clark University
- Kadin Reed – Undergraduate Research Assistant, Clark University
- Toral Banerjee – Undergraduate Research Assistant, Clark University
- Tom Ni – Undergraduate Research Assistant, Clark University
- Samar Khoso – Undergraduate Research Assistant, Clark University
- Lucian Terhorst – Undergraduate Research Assistant, Clark University
- Matthew Zaluski – Undergraduate Research Assistant, Clark University
- Kendall Lisa Codjoe – Undergraduate Research Assistant, Clark University
- Branson Witt, Alexander Vu, Sai Chanda, Aryadeep Ray – Data Science Collaboration Club (DSCO), Clark University

SERVICES

Committee Services

Program Committee – AAAI 2027

Program Committee – IJCAI-ECAI 2026

Program Committee – IEEE ICEBE 2026

Program Committee – AAAI 2026

Technical Committee– IEEE ICMRE 2024

Guest Editor

Special Issue: From Edge AI to On-Device LLMs: Hardware Architectures, Systems, and Applications – Electronics, MDPI

Special Issue: High-Performance Computing (HPC) and Computer Architecture – Computers, MDPI

Special Issue: Trends and Applications of Distributed Artificial Intelligence and Associated Systems – Electronics, MDPI

Journal Reviewer

Nature Electronics – Springer Nature

SCIENCE CHINA Materials – Science China Press

Intelligent Data Analysis – SAGE

Transactions on Computational Science – Springer

Applied Intelligence – Springer

Journal of Ambient Intelligence and Humanized Computing – Springer

Journal of Materials Science – Springer

Journal of Automation and Intelligence – Elsevier

Computers and Education: Artificial Intelligence – Elsevier

Sustainable Computing: Informatics and Systems – Elsevier

Engineering Applications of Artificial Intelligence – Elsevier

Micro and Nano Structures – Elsevier

Optics and Laser Technology – Elsevier

Optik – Elsevier

Transactions on Sensor Networks – ACM

IEEE/ACM Transactions on Computational Biology and Bioinformatics – IEEE/ACM

IEEE Transactions on Fuzzy Systems – IEEE

IEEE Transactions on Consumer Electronics – IEEE

Advances in Civil Engineering – Hindawi (Wiley)

International Journal of Image and Graphics – World Scientific

Photonics – MDPI

Sensors – MDPI

Electronics – MDPI

Micromachines – MDPI

Applied Sciences – MDPI

Semiconductor Science and Technology – IOP

Smart Materials and Structures – IOP

Journal of Physics D: Applied Physics – IOP

Journal of Physics: Communications – IOP

Physica Scripta - IOP

SOCIAL CONTRIBUTION AND LEADERSHIP

President of Student Union of SUSTech (2014 –2015)