# Xiaokun (Ken) Zhong

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**Work Authorization:** U.S. Permanent Resident (I-485 filed, EB-5). No visa sponsorship required.

## Education

**University of California, Berkeley** Jan 2026 – May 2026
*Visiting Student, Computer Science & Mathematics* *Berkeley, CA*
- Focus on data-efficient machine learning for physical systems, numerical optimization, and scalable training pipelines.

**Hong Kong University of Science & Technology (HKUST)** Sep 2022 – Jun 2026
*BSc in Mathematics (Computer Science Track)* *Hong Kong*
- Coursework: Differential Equations, Artificial Intelligence, Probability Theory.

## Research & Engineering Experience

**Dartmouth College & UC Berkeley** Feb 2025 – Present
*Research Engineer, Scientific Machine Learning* *Remote / Berkeley, CA*
- Analyzed training instability of physics-constrained neural networks under stiff PDE regimes, identifying optimization pathologies via Hessian spectrum diagnostics.
- Designed and implemented second-order optimization pipelines (Newton-CG) in JAX and PyTorch, achieving up to 50% error reduction and faster convergence on benchmark PDE tasks.
- Built scalable experiment infrastructure on Slurm-based HPC clusters to support large-scale ablation studies and reproducible model evaluation.

**HKUST Undergraduate Research Program** Feb 2023 – May 2025
*Research Engineer, Medical Imaging AI* *Hong Kong*
- Developed deep learning pipelines for MRI reconstruction and 3D volumetric modeling from sparse 2D medical scans.
- Optimized data ingestion and preprocessing workflows in Python and C++ for large-scale imaging datasets.

## Publications

Y. Hu, **X. Zhong**, et al. "Unveiling Multi-regime Patterns in SciML: Distinct Failure Modes and Regime-specific Optimization." Preprint, ICML 2026 submission under review.

## Technical Skills

**Machine Learning:** PyTorch, JAX (Flax/Optax), TensorFlow, Scikit-learn, Physics-informed ML

**Systems & Infrastructure:** Linux, Docker, Slurm, Git, HPC workflows, Bash

**Languages:** Python, C++, SQL, MATLAB

## Selected Projects

**Secure Network Tunneling & Transport Optimization (Personal Project)** Nov 2024
*Systems Engineer* *Remote*
- Designed and deployed a personal secure tunneling service (VLESS + Reality) on U.S.-based VPS infrastructure to improve reliability and latency for cross-region connectivity.
- Configured TLS-based transport, traffic obfuscation, and access control to harden the service against active probing and passive inspection.
- Optimized Linux networking parameters (e.g., TCP BBR) and monitored throughput/latency trade-offs under lossy network conditions.

**Autonomous Robotics Vision System (RoboMaster)** Oct 2022 – Jun 2023
*Computer Vision Engineer* *Hong Kong*
- Built real-time computer vision pipelines for autonomous target acquisition using OpenCV and Python.
- Implemented C++ drivers for sensor fusion and motor control on embedded STM32 platforms.

## Industry Experience

**Agricultural Bank of China** Jan 2024 – Feb 2024
*IT Intern (e-CNY Digital Currency)* *Shenzhen, China*
- Tested and improved security and functionality of an internal e-CNY wallet system, contributing to a large-scale digital currency pilot.