Chai-Wen Hsieh

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Professional Summary

PhD candidate in Computer Science specializing in storage systems optimization, and data deduplication. Over 5 years of industry experience in software engineering with expertise in distributed systems, cryptography, and performance optimization. Research focus on intelligent storage systems with practical applications in enterprise environments.

Education

- **University of Minnesota - Twin Cities** — Minneapolis, MN
  PhD candidate in Computer Science - Center for Research of Intelligent Storage — *Sep. 2018 – May.2026 (expected)*
- **National Chiao Tung University** — HsinChu, Taiwan
  Master of Science in Computer Science Cryptanalysis Lab — *Sep. 2010 – Jun. 2012*
  Bachelor of Engineering in Electrical and Electronics & Computer Science — *Sep. 2006 – Jun. 2010*

Selected Research Projects

- **Journal-Guided Data Placement for Tiered Storage Systems**: Developed a data placement strategy leveraging file system journaling to optimize block distribution across storage tiers, improving performance while reducing wear and balancing cost-efficiency. Implemented prototype in Linux kernel.
- **Distributed Data Deduplication in Edge-Cloud Environment**: Designed and implemented an edge-based data deduplication system that reduced cloud backup traffic by 35% and improved backup process time on cloud storage.
- **ZNS-SSD Performance Analysis and Architecture Optimization**: Evaluated Zoned Namespaces SSDs (ZNS) physical zone layouts using MQSim simulator to analyze performance impacts across synthetic and production workloads, providing insights for optimal SSD architecture design.
- **Deep Neural Network Hyperparameter Optimization**: Developed a genetic algorithm to automatically tune hyperparameters for Deep Neural Network training.
- **Secure Public-Key Searchable Encryption**: Designed an Elliptic Curve Cryptography based public-key cryptosystem enabling keyword search over conjunctive queries with 40% lower computational overhead compared to existing approaches. Published and presented findings at international cryptography workshop. (Master's thesis.)

Work Experience

- **Hewlett Packard Enterprise, Nimble Storage** — Bloomington, MN
  Two Fulltime Internships — *Jun. 2021 - Aug. 2021, Jun. 2022 - Aug. 2022*
  - **Fractal tree performance characterization**: Developed benchmarking tools to analyze Fractal Tree operations, identifying performance bottlenecks and improving throughput in enterprise storage systems.
  - **Improved b+-tree performance in distributed storage scenario**: Designed and implemented optimization for fractal trees with specialized workload in HPE storage settings.
- **University of Minnesota** — Minneapolis, MN
  Teaching Assistant — *Sep. 2022 - May. 2024*
  - **Teaching Assistant - Internet Programming**: Web app development using HTML, CSS, and JavaScript.
- **Industrial Technology Research Institute** — Hsinchu, Taiwan
  Research Engineer — *Oct. 2017 - May. 2018*
  - **Studied genetic algorithm on hyperparameter tuning for Deep Neural Network**: Applied hyperparameter optimization in deep learning training using genetic algorithm. Improved training time by 5%.
- **VIA Technologies, Inc.** — Taipei, Taiwan
  Senior Software Engineer — *Oct. 2012 - Oct. 2017*
  - **Cryptography Project**: Extracted OpenSSL crypto algorithms into a standalone library for CPU validation.
  - **Smart Home embbeded system**: Led a 5-member team to developed a integrated intercom system.
- **Cloud Computing Centre, Industrial Technology Research Institute** — HsinChu, Taiwan
  Fulltime Internship — *Jun. 2011 - Aug. 2011*
  - **Security-Enhanced Linux**: Developed log monitor system to alert potential infiltration of cloud OS in python.

Technical Skills

- **Languages**: C/C++, Python, JavaScript/HTML/CSS, Bash/Shell scripting
- **Storage & Systems**: Linux Kernel Development, File Systems, SSD Architecture, Distributed Systems
- **Machine Learning**: Course works on Deep Network Networks
- **Security**: Cryptography, ECC, OpenSSL, Secure Systems Design
- **Tools & Platforms**: Git, Docker, OpenSSL, Vim, VScode, Matlab, MQSim, Linux

Volunteer & Community Experience

- **Technical Community Contributor**: Active contributor to StackOverflow with 3000+ reputation points, specializing in Cryptography, OpenSSL, and Big Number libraries. Helped solve 100+ technical problems for the developer community.
- **STEM Education Advocate**: Invited speaker at Girls Who Code camp at University of Minnesota, introducing 25+ middle school girls to computer science fundamentals and inspiring next generation of women in tech.
- **Red Cross Taiwan Volunteer**: Certified lifeguard who participated in water safety operations at rivers around New Taipei City, contributing 200+ hours to public safety initiatives.