Chai-Wen Hsieh

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Education

- **University of Minnesota - Twin Cities** — Minneapolis, MN
  PhD student in Computer Science — *Aug. 2018 – Jun. 2023 (expected)*
- **National Chiao Tung University** — HsinChu, Taiwan
  Master of Science in Computer Science — *Sep. 2010 – Jun. 2012*
  Bachelor of Engineering in Electrical and Electronics & Computer Science — *Sep. 2006 – Jun. 2010*

Research Projects

- **Tiered storage and data deduplication (ongoing)**: Design a three-tiers storage deduplication system, implement functions and experiments with FUSE, including deduplication and recover data.
- **Distributed Deduplication (ongoing)**: Design a distributed deduplication system for IoT devices data backup to cloud data center, aiming for early deduplication to reduce data transfer.
- **Data deduplication on DNA storage (ongoing)**: Design a deduplication system for emerging DNA storage.
- **Distributed Shared Memory and Machine Learning**: Explored machine learning approaches to improve performance of distributed shared memory system.
- **Deep Neural Network training hyperparameter tuning**: Developed a genetic algorithm to automatically tune hyperparameters during Deep Neural Network training.
- **Distributed Deep Neural Network training**: Deployed Horovod framework to train distributed deep neural network with cifar-100 image dataset on multiple NVidia 1080 graphic cards.
- **"A Meet-In-The-Middle Attack against NTRU with Trinary Parameters"**: Conducted cryptanalysis on post-quantum cryptosystem, NTRU, proposed and implemented an experimental attack on that system. 1st author, Cryptology and Information Security Conference 2011.
- **Public Key Searchable Encryption with Conjunctive Queries**: Designed a public key cryptosystem which enables keyword search over conjunctive queries. Master's thesis.

Experience

- **Industrial Technology Research Institute** — Hsinchu, Taiwan
  Senior Software Engineer — *Oct. 2017 - May. 2018*
  - **Machine Learning**: Researched and implemented hyperparameter optimization in deep learning framework using genetic algorithm and improved model training speed by 5%.
- **VIA Technologies, Inc.** — Taipei, Taiwan
  Senior Software Engineer, Software Engineer — *Oct. 2012 - Oct. 2017*
  - **Light-weight cryptography library**: Integrated cryptography algorithms from OpenSSL library into light weight C library, ran
  - **Smart Home embbeded system**: Led a 5-member team to developed a integrated intercom system.
- **Cloud Computing Centre, Industrial Technology Research Institute** — HsinChu, Taiwan
  Intern — *Jun. 2011 - Aug. 2011*
  - **Security-enhanced linux**: Developed log monitor system to alert potential infiltration of cloud OS in python.
- **National Chiao Tung University** — HsinChu, Taiwan
  Research and Teaching Assistant — *Sep. 2010 - Jun. 2012*
  - **Research Assistant - Elliptic curve cryptography**: Explored clliptic curve pairings cryptosystems.
  - **Teaching Assistant - Introduction to Cryptography**: Taught two sections per semester; fully responsible for content, testing , and grading.

Programming Skills

- **Languages**: : C/C++ (expert), Java (expert), Python (intermediate)
- **Technologies**: : Git, FUSE, OpenSSL, vim, VScode, Android, Matlab, TensorFlow, Horovod

Volunteer Experience

- **Contributor**: : contributed to StackOverflow community in the areas of Cryptography, OpenSSL, Big Number.
- **Lecturer**: : gave a lecture at Girls Who Code camp at University of Minnesota.
- **Lifeguard**: : joined Red Cross Taiwan to secure water safety at rivers around New Taipei City.