Ting-Wu Chin

Last modified 2017/06/30

RESEARCH INTERESTS

I am broadly interested in machine learning, computer vision, and computer systems.

Currently, I am working on a project that explores the opportunities of a higher performance system for object detection by dynamic domain-specific approximation.

EDUCATION

National Chiao Tung University *2015-2017*
M.S., Computer Science
Advisor: Shiao-Li Tsao
Cum. GPA: 4.3 / 4.3

National Chiao Tung University *2011-2015*
B.S., Computer Science
Cum. GPA: 4.0 / 4.3

HONORS & RECOGNITIONS

- MediaTek Domestic PhD Fellowship (One of the five students in Taiwan), 2016
- Award of Outstanding Teaching Assistant, 2016
- NCTU PhD Fellowship, 2015
- CS MSc fall 2015 admission of EPFL, Switzerland, 2015
- Outstanding Award, System and Architecture Talent Incubation and Training Program, Ministry of Education Republic of China (Taiwan), 2014
- Selected Scholarship, System and Architecture Talent Incubation and Training Program, Ministry of Education Republic of China (Taiwan), 2014
- Outstanding Academic Scholarship in Programing Language course, 2012

PUBLICATIONS

Conference Papers

- **Ting-Wu Chin**, Shiao-Li Tsao, Kou-Wei Hung, and Pei-Shu Huang
  Improving Accuracy of Leakage Power Estimation of Embedded CPUs
  DATE 2017
- Hasan Genc, **Ting-Wu Chin**, Matthew Halpern, and Vijay Janapa Reddi
  Optimizing Sensor-Cloud Architectures For Real-Time Autonomous Drone Operation
  Sensors to Cloud Architecture Workshop (SCAW) 2017

RESEARCH EXPERIENCE

The University of Texas at Austin (*Visiting Student*)

Flying IoT (with Prof. Vijay Janapa Reddi) *8/2016-present*

- To understand and build the next generation software/hardware architecture for intelligent autonomous drones, or flying IoT.
- Characterize the performance of cognitive workloads on existing sensor and cloud compute paradigm.
- We found that performance, especially for flying IoT, is important since we are not there yet reaching the real-time performance and computing speed affect the time to finish a task, which has great impact on power consumption due to the time of hovering/flying.
- Based on 3DR Solo drone, nVidia Tegra X1, Intel Aero Board, and AirSim.

Domain Specific Approximation for Object Detection in Flying Agents (with Prof. Vijay Janapa Reddi) *8/2016-present*

- To improve performance for object detection-based flying agents, e.g. autonomous drones.

- Found that state-of-the-art object detection algorithms such as *Faster R-CNN* and *R-FCN* have no more then 2 fps running on modern embedded GPU platform, nVidia Tegra X1.
- Found that domain-specific approximation techniques such as image size scaling and number of proposal scaling can bring up to 7x speed improvement without losing accuracy in oracle when the techniques are applied dynamically.
- Based on nVidia's Tegra X1, and use OpenCV and Caffe. Counted on NI DAQ for power measurement.

National Chiao Tung University (*Graduate*)

Leakage Power Estimation (DATE 2017, Interactive Presentation)

- To improve accuracy of core-level leakage power estimation of embedded processors.
- We found that estimating leakage power with on-chip thermal sensor is inaccurate for certain type of benchmarks.
- Proposed both hardware and software methodologies to improve the accuracy of leakage power estimation. Reduce the error rate from up to 23% to no more than 3.4%.
- Simulation with Gem5, HotSpot, and McPAT. Real measurement with ODROID-XU3 (Samsung Exynos 5420) and infrared camera.

INDUSTRIAL EXPERIENCE

AILabs.tw summer 2017

Intern, Software Engineer

- Built up Face Swap, an open source project, and wrap up a docker container for it.
- Built Python wrapper for Face Swap.
- Improve the performance of Face Swap by 5x counting on approximation techniques.

MediaTek Summer 2014

Intern, Software Engineer

- Make the testcases more robust and help develop new API.
- Developed the DAG API for supporting implementation of Camera API level 3 in Hardware Abstraction Layer of Android Open Source Project.
- Integrated google test framework into their sanity checking system.

COURSE WORK

Graduate

- Operating System Design and Implementation
- Computer Architecture
- Advance Unix Programming
- Parallel Programming in Clouds

Cum. GPA for above courses: 4.3 / 4.3

Undergraduate

- Operating System
- Intro. to Compiler Design
- Intro. to Embedded System Design and Implementation
- Microprocessor System Lab.
- Assembly Language and System Programming

Cum. GPA for above courses: 4.3 / 4.3

TEACHING EXPERIENCE

Teaching Assistant

- Computer Organization, with Prof. Kai-Chiang Wu, S17
- Virtual Machine, with Prof. Wei Hsu, S17
- Operating System Design and Implementation, with Prof. Shiao-Li Tsao, S17, S16
- Microprocessor System Lab., with Prof. Shiao-Li Tsao, F17, F16

Students Mentored

- Te-Chi Chen, Undergraduate Student at National Chiao Tung University
- Hasan Genc, Undergraduate Student UT Austin
- Min-Yu Liu, Master Student at National Chiao Tung University
- Guan-Ren Chen, Master Student at National Chiao Tung University