

Tianyi Cui

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Education

University of Science and Technology of China, Special Class for the Gifted Young

Hefei, China

B.S. IN COMPUTER SCIENCE

Sep. 2014 - July 2018

- Overall GPA: **3.96/4.3** Rank: **2/147**
- Student at Honor Class

University of California, Los Angeles

Los Angeles, USA

VISITING SUMMER INTERN

July 2017 - Sep. 2017

- UCLA CSST program
- Individual research supervised by Jason Cong
- Got A for 12 credits

Research Interests

Systems, Networking, Computer Architecture

Research Experience

IPC-Direct: Fast and Compatible InterProcess Communication in User Space

Microsoft Research Asia

RESEARCH INTERN, ADVISOR: PROF. LINTAO ZHANG

Sep. 2017 - Now

- Accelerate Linux inter-process communication while keep compatibility with POSIX API
- Use logically centralized monitor process to coordinate communication
- Got 9x performance compared with socket on Linux
- Trying to scale it to multiple monitor processes and multiple servers using RDMA

Go-to-FPGA Compilation Framework: Let Software Programmer Play Hardware

UCLA

RESEARCH INTERN, ADVISOR: PROF. JASON CONG

June 2017 - Sep. 2017

- Developed a Golang to FPGA compiler to leverage Go routine and channel features in Golang
- Discovered several backend optimizations (Fine-grained parallelism and task-level pipeline) for my compiler to improve the performance of generated code

Wireless Backscatter with Commodity WiFi Device

USTC

RESEARCH ASSISTANT, ADVISOR: PROF. XIANGYANG LI, PROF. PANLONG YANG

Oct. 2016 - June. 2017

- Designed a wireless backscatter system which could transmit signal with off-the-shelf WiFi router
- Implemented some part of the system with FPGA and Labview

HTTPS Accelerator using FPGA

Microsoft Research Asia

RESEARCH INTERN, ADVISOR: PROF. KUN TAN

July. 2016 - Aug. 2016

- Offload RSA decryption in HTTPS handshake to FPGA
- Designed an efficient and scalable RSA algorithm on FPGA with High Level C-like Language
- Our accelerator saved up to 13 CPU cores compared to OpenSSL on CPU, to sustain 16K HTTPS connections per second
- Win the **global 2nd place** of the "Quality for cloud customers" challenge out of 200+ projects worldwide in Microsoft Hackathon

Projects

Low-power Consumption Operating System for DA14580 SoC

USTC

LEADER OF OS COURSE PROJECT, ADVISOR: PROF. KAI XING

Mar. 2016 - July 2016

- The first one to Port the OS(uC/OS II) to DA14580 lower-power bluetooth SoC.
- Implemented hibernation feature to cut down the power footprint and implemented Bluetooth Low Energy(BLE) 4.0 communication between DA and smartphone.
- Got the score of 100 on this OS course.

A Hardware Implementation of Google Authenticator

USTC

DIGITAL CIRCUIT COURSE PROJECT

Dec. 2015

- Implemented the Google Authenticator (Time-based One-time Password Algorithm) on FPGA
- Implemented the SHA-1 algorithm on FPGA and leverage shared registers between FPGA and CPU to synchronize time.

Awards

Oct. 2017	Guo Moruo scholarship , Highest honor in my university, top 1.7% of the our university	USTC
Oct. 2016	National scholarship , Top 0.2% of the nation	USTC
Aug. 2016	Global 2nd prize of "Quality for cloud customers" challenge , Microsoft Hackathon 2016	Microsoft
Jan. 2016	Outstanding essay , On the topic of An analysis of the privacy and security of MI Phone	USTC
Dec. 2015	Outstanding scholarship award ,	USTC
Oct. 2015	Gold medal , International Genetically Engineered Machine Competition(iGEM)	Boston, US
Aug. 2014	Bronze medal , National Olympiad in Informatics (NOI) (nationwide)	Shenzhen, China

Activities

Technical group of the school of the gifted young

USTC

PRESIDENT

May 2015-May 2016

- Maintained the web servers and network gateways of our school.
- Built the website of our school.

Linux User Group

USTC

PRESIDENT

May 2016 - June 2017

- Maintained a VPN server for hundreds of users.
- Organized several popular activities on Campus, such as Linux Install Party, Software Freedom Day, several lectures etc.

Skills

English	TOEFL: R29, L30, S22, W27, Total: 108, GRE score: Verbal: 154, Math: 170, Writing: 3.5
Program Language	C/C++, Python, CUDA, \LaTeX
Hardware	Verilog, OpenCL, Vivado, Quartus
Tools	Linux, Git, LLVM
Web Design	HTML, SQL, PHP