Beitong Tian

Graduate Research Assistant

(607) 319-9124
502 W. Griggs St., Urbana, IL 61801
beitong2@illinois.edu

Website: https://beitongt.github.io/
GitHub: beitong95
LinkedIn: beitongtian

EDUCATION

Ph.D. student in Computer Science, *University of Illinois Urbana-Champaign, 3.94/4.0.* Aug. 2019–Ongoing
Master of Engineering in Electrical and Computer Engineering, *Cornell University, 3.93/4.0.* Aug. 2017–Dec. 2018
Bachelor of Engineering in Electronic Science and Engineering, *Southeast University, 3.4/4.0.* Aug. 2013–July. 2017

GRADUATE LEVEL COURSES

Advanced Topics in IoT	Machine Learning for Signals	Advanced Distributed Systems
Security & Privacy for Home IOT	Wireless Networks & Mobile System	ML for System, Networks & Security

SKILLS

Software Skills Python, Golang, C++, MATLAB, Git, LaTeX, MarkDown
Hardware Skills Raspberry Pi, Arduino, Printed Circuit Board(PCB) design, Rapid Prototyping
Communication English, Chinese

RESEARCH EXPERIENCE

Graduate Research Assistant / MAINTLET JULY 2020 — Present
Multimedia Operating Systems and Networking (MONET) Research Group, UIUC *Champaign, IL*
- Designing a wireless sensor system for collecting data around scientific instruments in university key laboratories.
- Developing a time-series data processing framework to automatically detect potential instrument failures.

Graduate Research Assistant / SENSELET June 2020 — July 2021
Multimedia Operating Systems and Networking (MONET) Research Group, UIUC *Champaign, IL*
- Designed and deployed a scalable and extensible wireless sensor network for environmental data acquisition and visualization in the lithography clean room for Sensory Network infrastructure for Scientific Lab Environments (SENSELET) project.
- Developed an online, context-aware and intelligent anomaly detection system for the above system.

Independent Research / A Partition-Tolerant Blockchain for the Internet-of-Things Oct. 2018 — Dec. 2018
Computer Science, Cornell University *Ithaca, NY*
- Built a trusted partition-tolerant blockchain on Android device leveraging ARM TrustZone Technology.

R&D Software Engineer Intern June 2018 — Aug. 2018
Wireless RD Team, FORTINET *Sunnyvale, CA*
- Developed, maintained and tested a forward traffic log feature for Access Controller OS, using socket for process communication, RBtree and caching to speed up the system.
- Debugged and fixed local configure system for an OpenWrt based Access Point.
- Designed and implemented scripts to interact with Access Controller and Access Point to auto test channel features

Undergraduate Research Assistant Feb. 2016 — July 2017
Micro-Nano Biology System Lab, MEMS Lab, Southeast University *Nanjing, China*
- Designed, developed and tested a microfluidic embedded control system to identify and sort nematodes automatically.
- Analyzed experimental data with oscilloscope, signal generator, and spectrum analyzer.
- Programmed data process program with MATLAB.

PROJECT

Course Final Project / Providing SLA Guarantees in Multi-tenant Serverless Computing Platforms Jan. 2021 — Present
University of Illinois Urbana-Champaign *Champaign, IL*
- Built a monitoring infrastructure based on OpenWhisk log system, cAdvisor, InfluxDB and Grafana for visualizing and analysing the resource usage (CPU & memory) and latency breakdown of each container.
- Modified the source code of OpenWhisk to add SLA guarantees.
- Deployed and test the new system on a cluster of servers.

Course Final Project / A Hadoop-like Cloud Computing System Sept. 2020 — Dec. 2020
University of Illinois Urbana-Champaign *Champaign, IL*
- Programmed a distributed parallel computing system consists of command line interface, graphical user interface, membership protocol, distributed file system and MapReduce interface with Golang.
- Nominated as the best Golang Solution.

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Course Final Project / A location measurement system for indoor static sensors Sept. 2020 — Dec. 2020
University of Illinois Urbana-Champaign *Champaign, IL*

- Designed and developed a prototype to accurately measure the coordinate of sensors deployed in a complex indoor environment with the ultra-wideband module, infrared sensor and Inertial measurement unit (IMU).

Course Final Project / Semi-Targeted Password Cracking via Keywords Sept. 2019 — Dec. 2019
University of Illinois Urbana-Champaign *Champaign, IL*

- Train a recurrent neural network on password dataset to generate the password list.
- Use targeted keywords to sort the candidate password list to increase the success rate.

Course Final Project / Propeller Displayer Based on Arduino and Raspberry Pi Nov. 2017 — Dec. 2017
Cornell University *Ithaca, NY*

- Designed, assembled and refined the circuits and whole system structure.
- Programmed and debugged C and Python based program on Arduino and Raspberry Pi.
- Transmitted data from Raspberry Pi to Arduino via Bluetooth module for music spectrum display and controlled hall sensor, LED strip and motor in the system.

Intelligent Interface for Fitness Center Summer 2016
Southeast University *Nanjing, China*

- Conceptualized, developed, and produced an intelligent interface for fitness center machines based on Linux with Heart Rate sensor, EMG sensor, Camera and RFID recognition function.
- Designed and made a smart IoT device consists of infrared distance sensor, CC2541 Bluetooth module with 8051 MCU, 3D printing shell, and power supply system to automatically record exercise data.
- Presented the project in ISIPS 2016 (10th International collaboration Symposium on Information Production and Systems).

National Undergraduate Electronic Design Contest / Lithium Battery Charge/Discharge System July 2015 — Dec. 2015
Southeast University *Nanjing, China*

- Created STM32-based embedded system to implement the functions of measure, control, and display.
- Won the national 1st prize for bidirectional DC-DC converter for lithium battery system which is finished in 3 days.

PUBLICATION

- **Tian, B.**, Yang, Z., Moeini, H., Gupta, R., Su, P., Kaufman, R., ... & Nahrstedt, K. (2021, October). SENSELET++: A Low-cost Internet of Things Sensing Platform for Academic Cleanrooms. In 2021 IEEE 18th International Conference on Mobile Ad Hoc and Smart Systems (MASS) (pp. 90-98). IEEE.
- Zhu, Z., Chen, W., **Tian, B.**, Luo, Y., Lan, J., Wu, D., ... & Pan, D. (2018). Using microfluidic impedance cytometry to measure C. elegans worms and identify their developmental stages. Sensors and Actuators B: Chemical.
- Chen, W., **Tian, B.**, Lan, J., Chen, D., & Zhu, Z. (2017, June). Using microfluidic impedance cytometry to identify the life stages of C. elegans nematodes. In Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS), 2017 19th International Conference on (pp. 1628-1631). IEEE

PATENT

- **B. Tian**, "A New Bluetooth Audio Speaker" (Utility Model Patent, Grant), patented by State Intellectual Property Office of the PRC (Patent No.: CN 205545858 U).
- **B. Tian**, G. Hou, Z. Zhao, "A Smart Gym Lock Pin Intelligent Gymnasium System" (Invention Patent, Application), patented by State Intellectual Property Office of the PRC (Patent No.: CN 106310639 A).

TEACHING

- MSE 598: Intro to Digital Materials, University of Illinois Urbana-Champaign, Student Instructor. Spring 2021
- CS241: System Programming, University of Illinois Urbana-Champaign, Teaching Assistant. Fall 2019 & Spring 2020