ZITAO CHEN

X410C, ICICS, University of British Columbia, BC, Canada
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EDUCATION

1. **Bachelor of Engineering in Information Security** Sept. 2014 - Jun. 2018
   School of Computer Science, **China University of Geosciences (Wuhan)**
   GPA: 87.67/100
   GRE: V158 Q168 AW:3.5

2. **Master of Applied Science in Electrical and Computer Engineering** Sept. 2018 - present
   The University of British Columbia
   Supervisor: Prof. Karthik Pattabiraman

RESEARCH EXPERIENCE

Wearable Computing Security Undergraduate research

- Lightweight and real-time key establishment scheme for wearable embedded devices.
- Sensing user real-time motion to secure communication between body-worn devices.
- Key establishment scheme leveraging original sensory data.
- I independently proceeded the project under minimal supervision.

Reliability in Machine Learning Systems Graduate Research

- *Research question:* How to identify the critical bits in ML systems under the presence of transient hardware faults.
- We analyze the mathematical properties of common ML systems, and find many of them exhibit monotonicity, which constraints the fault propagation behaviors.
- We design a binary-search like fault injector to identify these critical bits, *without* resorting to doing fault injection (FI) on every state space.
- Our approach can identify over 99.54% of critical bits with significantly lower overhead than doing FI on every state space, which is the only other way to find these critical bits.
- Code: `https://github.com/DependableSystemsLab/TensorFI-BinaryFI`
- *Ongoing research:* Designing detection&protection techniques for enhancing the reliability and security (due to hardware faults) of ML systems.

PUBLICATION

- **[SC'19]** Zitao Chen, Guanpeng Li, Karthik Pattabiraman, Nathan DeBardeleben "BinFI: An Efficient Fault Injector for Safety-Critical Machine Learning Systems", *In Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, **AR: 20.9% (72/344) direct acceptance rate for regular papers.**

- **[FGCS]** Zitao Chen, Wei Ren, Yi Ren and Kim-Kwang Raymond Choo, "LiReK: A Lightweight and Real-time Key Establishment Scheme for Wearable Embedded Devices by Gestures or Motions", *Future Generation Computer Systems* (2018): 84, 126-138, [2018 Impact Factor: 5.768]

COMPUTER SKILLS

Programming Language	Python, C, Java, C++
Operation System	Linux, Windows

AWARD

Graduate Student Initiative: $4000 2019