Fan Zhang

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Education

Ph.D. Candidate in Computer Science — Aug, 2014–present
Advisor: Prof. Ari Juels
Dept. of Computer Science
Cornell University

B.S. in Electronic Engineering — Aug, 2010 – Jul, 2014
Tsinghua University, Beijing, China

Research Areas Applied Cryptography, Trusted Hardware, Blockchain

Industry Adoption My research has led to direct industry adoption. Town Crier [10] was licensed from Cornell by Chainlink and Ekiden [2] is used in Oasis Labs' products. CHURP [3] is on Oasis Labs product roadmap. DECO [5] is under licensing negotiation.

Honors/Awards

- IBM PhD Fellowship Award — 2018-2020
- Academic Excellence Scholarship, Tsinghua University, China — 2013
- National Scholarship, the Ministry of Education of China — 2012
- Freshman Scholarship, Tsinghua University, China — 2010

Selected Publications

[1] I. Bentov, Y. Ji, F. Zhang, Y. Li, X. Zhao, L. Breidenbach, P. Daian, and A. Juels, "Tesseract: Real-time cryptocurrency exchange using trusted hardware," in *ACM CCS (to appear)*, 2019.

[2] R. Cheng, F. Zhang, J. Kos, W. He, N. Hynes, N. M. Johnson, A. Juels, A. Miller, and D. Song, "Ekiden: A platform for confidentiality-preserving, trustworthy, and performant smart contracts," in *IEEE EuroS&P*, 2019.

[3] S. K. D. Maram*, F. Zhang*, L. Wang, A. Low, Y. Zhang, A. Juels, and D. Song, "CHURP: dynamic-committee proactive secret sharing," in *ACM CCS (to appear)*, (* indicates equal contribution), 2019.

[4] F. Zhang, P. Daian, I. Bentov, I. Miers, and A. Juels, "Paralysis proofs: Secure dynamic access structures for cryptocurrency custody and more," in *Proceedings of the 1st ACM Conference on Advances in Financial Technologies*, ser. AFT '19, 2019.

[5] F. Zhang, S. K. D. Maram, H. Malvai, S. Goldfeder, and A. Juels, "DECO: liberating web data using decentralized oracles for TLS," *CoRR*, vol. abs/1909.00938, 2019.

[6] E. Cecchetti, F. Zhang, Y. Ji, A. E. Kosba, A. Juels, and E. Shi, "Solidus: Confidential distributed ledger transactions via PVORM," in *ACM CCS*, B. M. Thuraisingham, D. Evans, T. Malkin, and D. Xu, Eds., ACM, 2017, pp. 701–717.

[7] F. Tramèr, F. Zhang, H. Lin, J. Hubaux, A. Juels, and E. Shi, "Sealed-glass proofs: Using transparent enclaves to prove and sell knowledge," in *IEEE EuroS&P*, IEEE, 2017, pp. 19–34.

[8] F. Zhang, I. Eyal, R. Escriva, A. Juels, and R. van Renesse, "REM: resource-efficient mining for blockchains," in *USENIX Security*, E. Kirda and T. Ristenpart, Eds., USENIX Association, 2017, pp. 1427–1444.

[9] F. Tramèr, F. Zhang, A. Juels, M. K. Reiter, and T. Ristenpart, "Stealing machine learning models via prediction apis," in *USENIX Security*, T. Holz and S. Savage, Eds., USENIX Association, 2016, pp. 601–618.

[10] F. Zhang, E. Cecchetti, K. Croman, A. Juels, and E. Shi, "Town crier: An authenticated data feed for smart contracts," in *ACM CCS*, E. R. Weippl, S. Katzenbeisser, C. Kruegel, A. C. Myers, and S. Halevi, Eds., ACM, 2016, pp. 270–282.

[11] L. Yang, Y. Cui, F. Zhang, J. P. Pollak, S. Belongie, and D. Estrin, "Plateclick: Bootstrapping food preferences through an adaptive visual interface," in *ACM CIKM*, ACM, 2015, pp. 183–192.

Professional Activity

- **Program Committee**: BITCOIN'18, collocated with Financial Crypto 2018.
- **Reviewer**: ACM Computing Surveys (2018), Nature Sustainability (2018)
- **Subreviewer**: USENIX Security (2016), TCC (2019)

Software Artifacts

My research yields practical systems and production-ready software artifacts. Here is a selected list of them and please see my Github page for more.

- Town Crier: an Authenticated Data Feed For Smart Contracts
  https://town-crier.org
- CHURP: Dynamic-Committee Proactive Secret Sharing
  https://churp.io
- mbedtls-SGX: a SGX-friendly TLS stack (ported from mbedtls)
  https://github.com/bl4ck5un/mbedtls-SGX

Working Experience

Researcher — May, 2017 – Aug, 2017
Oasis Labs — Berkeley, CA

Researcher — Jul, 2017 – Aug, 2017
SPR (Security & Privacy Research), Intel Labs — Hillsboro, OR

System developer intern — Jun, 2013 – May, 2014
Intel Opensource Technology Center (01.org) — Beijing, China

Teaching Experience

- TA for CS5435: Security and Privacy in the Wild — 2015, Fall
- TA for CS5300: the Architecture of Large-scale Information Systems — 2015, Spring
- TA for CS4410: Operating Systems — 2014 Fall

Invited Talks

Connecting Blockchains to the Real World

- ETH Zürich, Switzerland. — Oct, 2019
- IBM Watson Research Center (IBM PhD fellow). — Sep, 2019

On Trusted Hardware and Blockchain Hybridization

- Northeastern University, Cybersecurity Speaker Series. — Jan, 2019
- MIT, CSAIL. — Nov, 2018
- New York University, CS Colloquium. — Oct, 2018

Paralysis Proof

- ACM AFT 2019, Zürich, Switzerland. — Oct, 2019

- IC3 Retreat, New York City. May, 2018
- 5th Bitcoin Workshop, Financial Crypto'18, Curacao. Mar, 2018

REM

- USENIX Security'17, Vancouver BC, Canada. Aug, 2017

Town Crier

- Silicon Valley Ethereum Meetup, Santa Clara, CA. Aug, 2017
- IC3 Retreat, San Francisco, CA. Mar, 2017
- CCS'16, Vienna, Austria. Oct, 2016
- IC3 Retreat, New York City. May, 2016