Yuzhe Tang

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Academic Appointments

2022 -	Associate Professor, Department of EECS, Syracuse University
2014 - 2022	Assistant Professor, Department of EECS, Syracuse University

Education

Ph.D.	*Georgia Institute of Technology* (Atlanta, GA USA), 2009-2014
M.Sc.	*Fudan University* (Shanghai, China), 2006-2009
B.Sc.	*Fudan University* (Shanghai, China), 2002-2006

Research Interests

I am broadly interested in cyber-security and distributed systems. My current research focuses on distributed systems security and efficiency, in emerging/evolving infrastructures and applications such as blockchains, web infrastructures, cloud computing, etc. My research tackles the fundamental design tradeoff between security and performance. On the one hand, I analyze and measure large-scale deployed systems to identify, verify, and mitigate vulnerabilities. On the other hand, I optimize performance and build middlewares on security-centric systems.

Publications

- Underline indicates students advised by Dr. Yuzhe Tang

CCS 21	*DETER: Denial of Ethereum's Txpool-basEd seRvices* Kai Li, Yibo Wang, Yuzhe Tang ACM Conference on Computer and Communications Security (CCS) 2021
IMC 21	*TopoShot: Uncovering Ethereum's Network Topology Leveraging Replacement Transactions* Kai Li, Yuzhe Tang, Jiaqi Chen, Yibo Wang, Xianghong Liu ACM Internet Measurement Conference (IMC) 2021 Acceptance rate=28%
NDSS 21	*As Strong As Its Weakest Link: How to Break Blockchain DApps at RPC Service* Kai Li, Jiaqi Chen, Xianghong Liu, Yuzhe Tang, XiaoFeng Wang, Xiapu Luo The Network and Distributed System Security Symposium (NDSS) 2021 Acceptance rate=15.2%
FSE 21	*iBatch: Saving Ethereum Fees via Secure and Cost-Effective Batching of Smart-Contract Invocations* Yibo Wang, Qi Zhang, Kai Li, Yuzhe Tang, Jiaqi Chen, Xiapu Luo, Ting Chen ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) 2021 Acceptance rate=24.5%
Middleware 21i	*Authenticated Key-Value Stores with Hardware Enclaves* Yuzhe Tang, Kai Li, Qi Zhang, Jianliang Xu, Ju Chen ACM/IFIP Middleware 2021 (Industrial track)
ToNSE 21	*VFChain: Enabling Verifiable and Auditable Federated Learning via Blockchain Systems* Zhe Peng, Jianliang Xu, Xiaowen Chu, Shang Gao, Yuan Yao, Rong Gu, Yuzhe Tang IEEE Transactions on Network Science and Engineering (ToNSE) 2021
Middleware 20	*Cost-Effective Data Feeds to Blockchains via Workload-Adaptive Data Replication* Kai Li, Yuzhe Tang, Jiaqi Chen, Zhehu Yuan, Cheng Xu, Jianliang Xu ACM/IFIP Middleware conference 2020 Acceptance rate=25.2%
SERIAL 20	*Scalable Log Auditing on Private Blockchains via Lightweight Log-Fork Prevention* Yuzhe Tang, Kai Li, Yibo Wang, Sencer Burak Somuncuoglu Workshop on Scalable and Resilient Infrastructures for Distributed Ledgers 2020, co-located with ACM/IFIP Middleware conference 2020
ICDE 19	*GEM^2-Tree: A Gas-Efficient Structure for Authenticated Range Queries in Blockchain*

Ce Zhang, Cheng Xu, Jianliang Xu, Yuzhe Tang, Byron Choi
IEEE 36th International Conference on Data Engineering (ICDE) 2020
Acceptance rate=26.8%

SComm 19 *Secure Consistency Verification for Untrusted Cloud Storage by Public Blockchains*
Kai Li, Yuzhe Tang, Beom Heyn Kim, Jianliang Xu
SecureComm 2019

SComm 19 *Authenticated LSM Trees with Minimal Trust*
Yuzhe Tang, Ju Chen, Kai Li
SecureComm 2019 (Short paper)

CISSE 19 *Hands-on Labs for Secure Programming on Modern Trusted Platforms*
Yuzhe Tang, Wenliang Du
The Colloquium For Information Systems Security Education, 2019

ASONAM 19p *Computing Node Clustering Coefficients Securely*
K. Areekijseree, Yuzhe Tang, Sucheta Soundarajan
IEEE ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), 2019 (Poster paper)

SComm 18 *Secure and Efficient Multi-Party Directory Publication for Privacy-Preserving Data Sharing*
K. Areekijseree, Ju Chen, Yuzhe Tang, Shuang Wang, Arun Iyengar and B. Palanisamy
SecureComm 2018, Acceptance rate=30.6%

Cloud 18 *ChainFS: Blockchain-Secured Cloud Storage*
Qiwu Zou, Yuzhe Tang, Ju Chen, Kai Li, Charles Kamoua, Kevin Kwiat, Laurent Njilla
IEEE Cloud 2018, Acceptance rate=20%

Cloud 18 Pinchao Liu, Liting Hu, Hailu Xu, Zhiyuan Shi, Jason Liu, Qingyang Wang, Jai Dayal and Yuzhe Tang
A Toolset for Detecting Containerized Application's Dependencies in CaaS Clouds
IEEE Cloud 2018, Acceptance rate=20%

Cloud 18 Hailu Xu, Liting Hu, Pinchao Liu, Yao Xiao, Wentao Wang, Jai Dayal, Qingyang Wang and Yuzhe Tang
Oases: An Online Scalable Spam Detection System for Social Networks
IEEE Cloud 2018, Acceptance rate=20%

FC 18w *Lightweight Blockchain Logging for Data-Intensive Applications*
Yuzhe Tang, Zihao Xing, Cheng Xu, Ju Chen, Jianliang Xu
The Workshop of Trusted Smart Contract at the International Conference of Financial Cryptography 2018

VT 18 *Non-interactive Identity-based Underwater data transmission with Anonymity and Zero-knowledge*
Changsheng Wan, Vir V Phoha, Yuzhe Tang, Aiqun Hu
IEEE Transactions on Vehicular Technology 2017

CIC 17 *PADS: Privacy-preserving Auction Design for Allocating Dynamically Priced Cloud Resources*
Jinlai Xu, Balaji Palanisamy, Yuzhe Tang, SD Madhu Kumar
IEEE CIC 2017

SOSP 17w *Strongly Secure and Efficient Data Shuffle on Hardware Enclaves*
Ju Chen, Yuzhe Tang, Hao Zhou
The Workshop of Systems Software for Trusted Execution (SysTEX) at ACM SOSP 2017

ICDCS 17p *Towards Secure Public Directory for Privacy-Preserving Data Sharing*
Amin Fallahi, Xi Liu, Yuzhe Tang, Shuang Wang, Rui Zhang
IEEE International Conference on Distributed Computing Systems, Poster

ICDCS 17w *Social-Aware Decentralization for Efficient and Secure Multi-Party Computation*
Yuzhe Tang, Sucheta Soundarajan
The Workshop of Big-Data Privacy and Security at IEEE International Conference on Distributed Computing Systems

BMC 16 *Secure Multi-pArty Computation Grid LOgistic REgression (SMAC-GLORE)*
Haoyi Shi, Chao Jiang, Wenrui Dai, Xiaoqian Jiang, Yuzhe Tang, Lucila Ohno-Machado and Shuang Wang
BMC Medical Informatics and Decision Making [open access]

SecDev 16 *Towards Building Practical And Secure Multi-Party Databases*
Yuzhe Tang, Wenqing Zhuang
IEEE Cyber-security Development Conference 2016 (Abstract)

Bioinfomatics 16 *HEALER: Homomorphic computation of ExAct Logistic rEgRes-sion for secure rare disease variants analysis in GWAS*
Shuang Wang, Y. Zhang, W. Dai, K. Lauter, M. Kim, Yuzhe Tang, X. Jiang
Oxford Journals BioInformatics, doi: 10.1093/bioinformatics/btv563

BMC 15 *Privacy-preserving GWAS analysis on federated genomic datasets*
Scott D Constable, Yuzhe Tang, Shuang Wang, Xiaoqian Jiang, Steve Chapin
BMC Medical Informatics and Decision Making 2015, [Open access]

TKDE 15 *Privacy-Preserving Multi-Keyword Search in Information Networks*
Yuzhe Tang, Ling Liu
IEEE Trans. Knowl. Data Eng. 27(9): 2424-2437 (2015)

CCGrid 15 *Deferred Lightweight Indexing for Log-Structured Key-Value Stores*
Yuzhe Tang, Arun Iyengar, Wei Tan, Liana Fong, Ling Liu, Balaji Palanisamy
IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing 2015: 11-20
Best Paper Award

HPBDC 15 *KTV Tree: Interactive Top-K Aggregation on Large Dataset in Cloud*
Yuzhe Tang, Ling Liu, Junichi Tatemura, Hakan Hacigumus
IEEE International Conference of Distributed Computing Systems Workshops 2015: 136-141

HotCloud 15 *Privacy-Preserving Offloading of Mobile App to the Public Cloud*
Yue Duan, Mu Zhang, Heng Yin, Yuzhe Tang
USENIX Workshop on Hot Topics in Cloud Computing 2015
Acceptance rate=32.8%

TBC 15 *Secure Multi-party Computation on Grid Logistic Regression*
Haoyi Shi, Shuang Wang, Wenrui Dai, Yuzhe Tang, Xiaoqian Jiang, LucilaOhno-Machado
Annual Translational Bioinformatics Conference 2015

ACSAC 14 *Lightweight Authentication of Freshness in Outsourced Key-Value Stores*
Yuzhe Tang, Ling Liu, Xin Hu, Jiyong Jang
USENIX/ACM Annual Computer Security Applications Conference 2014: 176-185
Acceptance rate=19.9%

ICDCS 14 *e-PPI: Locator Service in Information Networks with Personalized Privacy Preservation*
Yuzhe Tang, Ling Liu, Arun Iyengar
IEEE International Conference of Distributed Computing Systems 2014: 186-197
Acceptance rate=13%

EDBT 14 *Diff-Index: Differentiated Index in Distributed Log-Structured Data Stores*
Wei Tan, Sandeep Tata, Yuzhe Tang, Liana Fong
International Conference on Extending Database Technology 2014: 700-711
Acceptance rate=20%

JDPD 14 *Anonymizing Continuous Queries with Delay-tolerant Mix-zones on Road Networks*
Balaji Palanisamy, Ling Liu, Kisung Lee, Shicong Meng, Yuzhe Tang
International Journal of Distributed and Parallel Databases 32(1): 91-118 (2014)

ICDE 14d *Outsourcing multi-version key-value stores with verifiable data freshness*
Yuzhe Tang, Ling Liu, Ting Wang, Xin Hu, Reiner Sailer, Peter Pietzuch
IEEE International Conference on Data Engineering 2014: 1214-1217 (Demo paper)

TPDS 13 *Auto-pipelining for Data Stream Processing*
Yuzhe Tang, Bugra Gedik
IEEE Trans. Parallel Distrib. Syst. 24(12): 2344-2354 (2013)

Cloud 13 *Residency Aware Inter-VM Communication in Virtualized Cloud: Performance Measurement and Analysis*
Qi Zhang, Ling Liu, Yi Ren, Kisung Lee, Yuzhe Tang, Xu Zhao, Yang Zhou
IEEE International Conference on Cloud Computing 2013: 204-211

Cloud 13 *Efficient and Customizable Data Partitioning Framework for Distributed Big RDF Data Processing in the Cloud*
Kisung Lee, Ling Liu, Yuzhe Tang, Qi Zhang, Yang Zhou
IEEE International Conference on Cloud Computing 2013: 327-334

MSN 12 *Location Privacy with Road Network Mix-Zones*
Balaji Palanisamy, Ling Liu, Kisung Lee, Shicong Meng, Yuzhe Tang
IEEE International Conference on Mobile Ad-hoc and Sensor Networks 2012: 124-131

Cloud 12 *Reliable State Monitoring in Cloud Data Centers*
Shicong Meng, Arun Iyengar, I. Rouvellou, Ling Liu, Kisung Lee, Balaji Palanisamy, Yuzhe Tang
IEEE International Conference on Cloud Computing 2012: 951-958
Best Paper Award

CIKM 11 *Privacy Preserving Indexing for eHealth Information Networks*
Yuzhe Tang, Ting Wang, Ling Liu, Shicong Meng, Balaji Palanisamy
Conference on Information and Knowledge Management 2011: 905-914
Acceptance rate=15% (Full paper)

TPDS 11 *A Lightweight Multi-dimensional Index for Complex Queries over DHTs*
Yuzhe Tang, Jianliang Xu, Shuigeng Zhou, Wang-Chien Lee, Dingxiong Deng, Yue Wang
IEEE Trans. Parallel Distrib. Syst. 22(12): 2046-2054 (2011)

TKDE 10 *LIGHT: A Query-Efficient yet Low-Maintenance Indexing Scheme over DHTs*
Yuzhe Tang, Shuigeng Zhou, Jianliang Xu
IEEE Trans. Knowl. Data Eng. 22(1): 59-75 (2010)

ICDCS 09 *m-LIGHT: Indexing Multi-Dimensional Data over DHTs*
Yuzhe Tang, Jianliang Xu, Shuigeng Zhou, Wang-Chien Lee
IEEE International Conference of Distributed Computing Systems 2009: 191-198
Acceptance rate=16%

ICDCS 08 *LHT: A Low-Maintenance Indexing Scheme over DHTs*
Yuzhe Tang, Shuigeng Zhou
IEEE International Conference of Distributed Computing Systems 2008: 141-151

In submission — *Towards Saving Blockchain Fees via Secure and Cost-Effective Batching of Smart-Contract Invocations*
Yibo Wang, Kai Li, Yuzhe Tang, Jiaqi Chen, Qi Zhang, Xiapu Luo, Ting Chen
In submission to TSE (IEEE Transactions on Software Engineering)

In submission — *Efficiently Hardening SGX Enclaves against Side Channels via Dynamic Program Partitioning*
Yuzhe Tang, Kai Li, Jiaqi Chen, Yibo Wang, Cheng Xu
In submission to ICSE 2022

In submission — *AEEP: Automated Enclave EVM Partition*
Xi Xiao, Hanqi Zhang, Wentao Xiao, Xiapu Luo, Yuzhe Tang, Xingjun Wang
In submission to ICSE 2022

Research Funds

- Summary: Grants awarded 11, total (Tang's share awarded):$1.81M

2023-2026 — CNS Core: Small: One Size doesn't Fit All: Workload-Aware Cost Optimization for Decentralized Applications on Blockchains
Yuzhe Tang (Single PI), $498,624
National Science Foundation (**NSF**)

2022-2023 — DoS-secure transaction propagation on Ethereum: Exploit generation and attack detection
Yuzhe Tang (single PI), $84,392
Ethereum Foundation

2021-2024 — Collaborative Research: SaTC: EDU: Developing Instructional Laboratories for Blockchain Security Applications,
Yuzhe Tang (PI), Jing Lei, Farzana Rahman, Hongmei Chi.
Total: $399,995, PI Tang's portion: $340,000
National Science Foundation (**NSF**)

2018-2021 — SaTC: Small: External Obliviousness in Trusted Execution Environments
Yuzhe Tang (Single PI), $496,999 + $16,000
National Science Foundation (**NSF**)

2019-2020 — Planning IUCRC Syracuse University: Center for High-Assurance Secure Systems and IoT (CHASSI)
Shui-Kai Chin (PI), Yuzhe Tang (Co-PI), $15,000
National Science Foundation (**NSF**)

2018-2020 — SGX-based Key-Management Applications in the Cloud
Yuzhe Tang (Single PI), $9,996
Intel Gift

2017-2018 — Cryptographic Engineering on Modern Trusted Platforms
Yuzhe Tang (PI), Wenliang Du (Co-PI), $300,000
National Security Agency (**NSA**)

2017-2017 — Secure Multi-Party Databases by Oblivious Query Translation and Execution
Yuzhe Tang (PI), $13,200
Air Force Research Lab Visiting Faculty Research Program

2015-2016 — Optimizing Privacy-Preserving Analytics in Information Networks
Yuzhe Tang (PI), $69,861
Cyber Research Institute (CRI)

Internal Grants

2021-2023 — Workload-Adaptive Designs for Cost-Effective Decentralized Applications on Blockchains
Yuzhe Tang (Single PI), $21,000,
CUSE Grant (Syracuse University Internal Grant)

2018-2020 — On-Campus Blockchain Applications for Education and Beyond
Wenliang Du (PI), Yuzhe Tang (Co-PI), $30,000
CUSE Grant (Syracuse University Internal Grant)

2018-2020 — Efficient Algorithms for Secure, Large-Scale Graph Mining
Yuzhe Tang (PI), Sucheta Soundarajan (Co-PI), $30,000
CUSE Grant (Syracuse University Internal Grant)

Patents

2015 — Adaptive Auto-pipelining in Stream Processing Applications
Bugra Gedik, Scott A. Schneider, Yuzhe Tang, Kun-lung Wu
US patent granted (US9098350B2)

Teaching

Fall 2021	CIS629/FIN629, *Blockchain Foundation and Applications*
Fall 2020	CIS600/FIN600, *Cryptocurrencies and Blockchains*
Fall 2019	CIS600/FIN600, *Cryptocurrencies and Blockchains*
	CIS628/CIS428, *Introduction to Applied Cryptography*
Spring 2019	CSE384, *System Programming*
Fall 2018	CIS600/FIN600, *Blockchain and Cryptocurrency*
Spring 2018	CIS300, *Introduction to System Programming*
Fall 2017	CIS700, *Modern Information Security and Privacy*
Spring 2017	CIS/CSE600, *Applied Cryptography*
	CIS655/CSE661, *Advanced Computer Architecture*
	CIS423, *System Programming*
Spring 2016	CIS700/CSE791, *Big-Data and Cloud Security*, website: [link]
Fall 2015	CIS655/CSE661, *Advanced Computer Architecture*, website: [link]
Spring 2015	CIS700/CSE791, *Distributed Systems in Cloud*, website: [link]
Fall 2014	CIS655/CSE661, *Advanced Computer Architecture* (180 students)

Advising

Ph.D. students

- Yibo Wang: *FSE'21 (1st author)*, IMC'21 (co-author)
- Jiaqi Chen: NDSS'21, IMC'21, FSE'21, Middleware'20 (co-author)
- Xianghong Liu: NDSS'21, IMC'21 (co-author)
- Yuxuan Zhou
- Wanning Ding

Undergraduate students (REU)

- Eniola Mosaku, Jack Willis, Nicholas Sweet, Mingyan Zhang

Alumni

- Dr. Kai Li, Tenure-track Assistant Professor in CS dept. at San Diego State Univ. (joining Fall 2022).
  - Papers (during Ph.D.): *CCS'21 (1st author), IMC'21 (1st author), NDSS'21 (1st author), Middleware'20 (1st author)*.
  - Internships: IBM Research '20, Amazon '21
  - Award: NortonLife Ph.D. fellowship finalist '22
- M.Sc.: Vinutha Karanth (Microsoft), Sencer Burak Somuncuoglu (Chainalysis), Kang Lou, Katchaguy Areekijseree (PhD at Syracuse Univ.), Hari Krishna Gajarla (Bloomberg)
- B.Sc. (including REU): Zhehu Yuan (Ph.D. at NYU), Qiwu Zou (Cornell Univ.), Congcong Xie (NYU, then Oracle), Adam Piekarski, Jeong Bin Oh (A database startup), Sharell Scott (Google)
- Visiting scholar: Cheng Xu (Postdoc at Simon Fraser Univ.)

Professional Services

Program chair	Great Lake Security Day (GLSD 20/18)
	The International Workshop of Blockchain and Data Management (BlockDM) 21/20/19 (co-located with ICDE)
Program committee	WWW (21/20), ICDCS (20/17/15), IPDPS 18, ICICS (22/21), IEEE Cloud 15, PAIS (16/15)
	TOCS 17, TKDE (17/16/15), TSC (21/17/16/15), IEEE Computing 17, TWeb 15, TCSVT 14

Internship Experience

05/2013-08/2013	IBM Research (T.J. Watson Lab) at Yorktown Heights, NY USA
05/2012-08/2012	IBM Research (T.J. Watson Lab) at Yorktown Heights, NY USA
05/2011-08/2011	IBM Research (T.J. Watson Lab) at Hawthorn, NY USA
05/2010-08/2010	NEC Labs America at Cupertino, CA USA
01/2009-06/2009	Microsoft Research Asia at Beijing, China
01/2006-04/2006	IBM Corp. at Shanghai, China

Honors and Awards

- Air Force Research Lab (AFRL) Visiting Faculty Research Award, 2017
- Best paper award, 15th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing, 2015
- Chinese Government Award for Outstanding Self-financed Students Abroad, 2012
- Best paper award, 5th International Conference on Cloud Computing, 2012
- Outstanding Master Thesis of Shanghai, Shanghai Government, 2010

- Tung's Oriental Scholarship, Tung's Oriental, 2008
- HP Distinguished Chinese Student Scholarship, Hewlett-Packard, 2008
- ICDCS Student Travel Grant, TCDP (IEEE Computer Society), 2008
- Graduate Student Fellowship of Fudan University, 2007-2008 (2 times)
- Outstanding Graduated Student of Fudan University, 2006
- Excellence Award, Tencent Innovation Contest, 2006
- The Peoples Scholarship of Fudan University, 2002-2006 (4 times)
- Chinese Physics Olympiads, First Prize in Hunan Province, 2001

Invited Talks

Research talks

- Blockchain communication security and efficiency
  - Ohio State University ('21), University of Louisiana at Lafayette ('21)
- DETER: Denial of Ethereum Txpool Service
  - Consensus day '21
- Lightweight Data Authentication in Outsourced Key-Value Stores
  - Cornell University ('17), Xi'an Jiao Tong University ('17), Fudan University ('16), Louisiana State University ('14)
- Searching HIE with Differentiated Privacy Preservation
  - HealthTech '14, colocated with USENIX Security, San Diego, CA
- Scalable and secure cloud service in big data systems
  - University of Delaware ('14), North Kentucky University ('14), NEC Lab ('14), IBM Research ('14), Missouri University of Science and Technology

Panel

- Blockchain Database, VLDB '21 panel [link].

Lectures to the general public

- Public lecture: "Get Your Head In The Clouds! Cloud Computing: Risks and Rewards"
  - TACNY Junior Cafe Scientifique, Museum of Science & Technology, Syracuse ('17)
  - NSBE (National Society of Black Engineers) Jr. Science Camp. hosting Grades 7 - 12 in Syracuse City School District ('17)
- Public lecture: "Blockchain: Applications, Security Promises and Internals"
  - CSIAC ('17), Syracuse University Alumni Event ('21)