Cheng Xu

RRS 726, Department of Computer Science
Hong Kong Baptist University, Hong Kong
☎ (+852) 3411-5962 · ✉ chengxu@comp.hkbu.edu.hk
🏠 https://xuc.me · ⓞ xu-cheng · ⓛ xu-cheng

RESEARCH INTERESTS

I am interested in Databases, Cryptography, Information Security and Privacy-Aware Computing. My current focuses include:

- Authenticated query processing for outsourcing cloud computing.
- Searchable blockchain with integrity assurance.
- Privacy preserving query processing and access control.

PROFESSIONAL EXPERIENCE

Hong Kong Baptist University — Hong Kong
Ph.D. Candidate — *Nov 2014 – Feb 2019*
Senior Research Assistant — *Dec 2018 – Present*

- Designed novel algorithms and indexes for cloud-based query services to support efficient verifiable query processing in a wide range of enterprise systems.
- Developed novel techniques to enable integrity assured search in scalable hybrid-storage blockchain systems.
- Resulted to several research papers published in top-tier journals and conferences.

Syracuse University — Syracuse, NY, USA
Visiting Scholar — *Sep 2017 – Dec 2017*

- Advisor: Dr. Yuzhe Tang
- Designed and implemented a memory-access pattern secure software system on Intel SGX.
- Developed a dynamic program partitioning framework to support implementing a variety of external oblivious algorithms and achieving cache-miss obliviousness.

Homebrew — Hong Kong
Core Maintainer — *Feb 2015 – Feb 2017*

- `https://brew.sh`
- Acted as one of the core maintainers for the open source project Homebrew, which is the most popular package manager on macOS.
- Implemented several major features and improvements including better tap system, core/formulae split, sandbox system, portable Ruby, and many bug fixes.

Huazhong University of Science and Technology — Wuhan, China
Final Year Project — *Sep 2013 – Jun 2014*

- Advisor: Dr. Xiaojun Hei
- Designed and implemented a smart home router system using software defined network technology.

EDUCATION

Hong Kong Baptist University — Hong Kong
Ph.D. in Computer Science — *Nov 2014 – Feb 2019*
Dissertation: Authenticated Query Processing in the Cloud
Advisor: Prof. Jianliang Xu

Huazhong University of Science and Technology — Wuhan, China
Bachelor of Engineering in Electronics & Information Engineering — *Sep 2009 – Jun 2014*

SKILLS

Programming C/C++, Rust, Java, Python, Ruby, Matlab, LaTeX, Bash, SQL, Vimscript, Javascript, HTML, CSS
Tools Vim, Tmux, Git, macOS, Linux
Languages English, Mandarin

PUBLICATIONS	1. **C. Xu**, C. Zhang, and J. Xu, "vChain: Enabling verifiable boolean range queries over blockchain databases," in *Proceedings of the 2019 ACM SIGMOD International Conference on Management of Data (SIGMOD '19)*, Amsterdam, Netherlands, Jun. 2019, Full Paper.

1. **C. Xu**, C. Zhang, and J. Xu, "vChain: Enabling verifiable boolean range queries over blockchain databases," in *Proceedings of the 2019 ACM SIGMOD International Conference on Management of Data (SIGMOD '19)*, Amsterdam, Netherlands, Jun. 2019, Full Paper.

2. S. Guo, J. Xu, C. Zhang, **C. Xu**, and T. Xiang, "ImageProof: Enabling authentication for large-scale image retrieval," in *Proceedings of the 35th IEEE International Conference on Data Engineering (ICDE '19)*, Macau SAR, China, Apr. 2019, Full Paper.

3. Y. Ji, **C. Xu**, J. Xu, and H. Hu, "vABS: Towards verifiable attribute-based search over shared cloud data," in *Proceedings of the 35th IEEE International Conference on Data Engineering (ICDE '19)*, Macau SAR, China, Apr. 2019, Demo Paper.

4. C. Zhang, **C. Xu**, J. Xu, Y. Tang, and B. Choi, "GEM^2-Tree: A gas-efficient structure for authenticated range queries in blockchain," in *Proceedings of the 35th IEEE International Conference on Data Engineering (ICDE '19)*, Macau SAR, China, Apr. 2019, Full Paper.

5. **C. Xu**, J. Xu, H. Hu, and M. H. Au, "When query authentication meets fine-grained access control: A zero-knowledge approach," in *Proceedings of the 2018 ACM SIGMOD International Conference on Management of Data (SIGMOD '18)*, Houston, TX, USA, Jun. 2018, pp. 147–162, Full Paper.

6. C. Zhang, **C. Xu**, J. Xu, and B. Choi, "Distributed kNN query authentication," in *Proceedings of the 19th IEEE International Conference on Mobile Data Management (MDM '18)*, Aalborg, Denmark, Jun. 2018, pp. 167–176, Full Paper.

7. **C. Xu**, Q. Chen, H. Hu, J. Xu, and X. Hei, "Authenticating aggregate queries over set-valued data with confidentiality (extended abstract)," in *Proceedings of the 34th IEEE International Conference on Data Engineering (ICDE '18)*, Paris, France, Apr. 2018, pp. 1797–1798, Poster Paper.

8. **C. Xu**, Q. Chen, H. Hu, J. Xu, and X. Hei, "Authenticating aggregate queries over set-valued data with confidentiality," *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, vol. 30, no. 4, pp. 630–644, Apr. 2018, Full Paper.

9. Y. Tang, Z. Xing, **C. Xu**, J. Chen, and J. Xu, "Lightweight logging over the blockchain for data-intensive applications," in *2nd Workshop on Trusted Smart Contracts at International Conference on Financial Cryptography and Data Security*, Santa Barbara Beach Resort, Curaçao, Mar. 2018, pp. 308–324, Workshop Paper.

10. Q. Zhu, H. Hu, **C. Xu**, J. Xu, and W.-C. Lee, "Geo-social group queries with minimum acquaintance constraints," *The VLDB Journal (VLDBJ)*, vol. 26, no. 5, pp. 709–727, Jul. 2017, Full Paper.

TALKS

1. vChain: Enabling Verifiable Boolean Range Queries over Blockchain Databases, *2019 ACM SIGMOD International Conference on Management of Data*, Amsterdam, Netherlands, July. 2019.

2. Towards Searchable and Verifiable Blockchain, *1st Workshop on Blockchain and Mobile Applications at 35th IEEE International Conference on Data Engineering*, Macau, Apr. 2019.

3. When Query Authentication Meets Fine-Grained Access Control: A Zero-Knowledge Approach, *2018 ACM SIGMOD International Conference on Management of Data*, Houston, USA, Jun. 2018.

AWARDS

- SIGMOD Travel Award, ACM *2018*
- Research Performance Award, Hong Kong Baptist University *2018*
- Postgraduate Research Symposium Best Research Performance Award & Best Poster Award, Hong Kong Baptist University *2018*
- Yakun Scholarship Scheme for Mainland Postgraduate Students, Hong Kong Baptist University *2018*
- Excellent Teaching Assistant Performance Award, Hong Kong Baptist University *2017*
- Teaching Assistant Performance Award, Hong Kong Baptist University *2015, 2016*