

## Xiaoting Tang (Jason)

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RESEARCH INTERESTS	<b>Software Security :</b> Software Reverse Engineering, Anti-cheating & bypassing, Kernel security and other software securities topics.	
PUBLICATION	<b>Xiaoting Tang</b> , Cong Wang, Xingliang Yuan, and Qian Wang, "Non-Interactive Privacy-Preserving Truth Discovery in Crowd Sensing Applications", In the 37th International Conference on Computer Communications ( <b>INFOCOM'18</b> ), Honolulu, HI, USA, 2018. (Acceptance ratio: 309/1606 = 19.2%) Yifeng Zheng, Huayi Duan, <b>Xiaoting Tang</b> , Cong Wang, and Jiantao Zhou, "Denoising in the Dark: Privacy-Assured Healthcare Monitoring with Encrypted Denoising", In the 5th Annual Trends in Forensic Sciences Conference ( <b>TIFS'18</b> ), University of Windsor, ON, Canada, 2018.	
SOFTWARES	<b>GASH</b> - GARbled Circuit SyntHesizer – a self-contained framework for secure multi-party computation using Yao's garbled circuit written in C++. Softwares includes a language parser and circuit execution framework. <a href="#">Link</a> <b>GAHS-viewer</b> - A user-friendly front-end for GASH. Developed for MacOS. <a href="#">Link</a> (use the gash-gui branch)	
RESEARCH EXPERIENCE	<b>Research Assistant, City University of Hong Kong</b> <span style="float: right;"><i>August 2016 - Dec 2017</i></span> <ul style="list-style-type: none"><li>• <b>Machine Learning over Hybrid Data: Secure Realization and Acceleration</b><ul style="list-style-type: none"><li>• Propose a new method to improve privacy-perserving machine learning system's performance</li><li>• Provide adjustable trade-off for users with both security and performance requirements</li><li>• Improve existing framework by adopting more efficient algorithms for garbled circuit</li></ul></li><li>• <b>Non-Interactive Privacy Preserving Truth Discovery</b><ul style="list-style-type: none"><li>• Completely remove the online requirement of server and clients during protocol execution</li><li>• Failure resistance during client's submission of information</li><li>• Has comparable and practical performance compared with prior arts</li></ul></li><li>• <b>Verifiable Middlebox Service</b><ul style="list-style-type: none"><li>• Develop a modular router system using Click language</li><li>• Implement <i>Ringer</i> - a middlebox fraud detection mechanism</li><li>• Conduct systematic testing of current system</li></ul></li></ul>	
PREVIOUS EMPLOYMENT	<b>Senior Developer, Accord Apps Development and Marketing</b> <span style="float: right;"><i>June 2015 to May 2016</i></span> <ul style="list-style-type: none"><li>• Selected Apps:<ul style="list-style-type: none"><li>• Smartrate - High Volume Currency Exchange, <b>3000 downloads in 3 months</b></li><li>• Smartguy - Real Time Photo Retouching, <b>1200 downloads in 1 month</b></li><li>• JinQing - Registering System for JingQing Volunteering Organization</li><li>• Mitsubishi - Full Catalogue System for <b>Mitsuishi Asia Inc.</b></li></ul></li><li>• Comments: <i>Ting is the best intern I have ever had. – Mr. Jason Chong, President</i></li></ul> <b>Industrial Trainee, HSBC Hong Kong</b> <span style="float: right;"><i>June 2014 to Dec 2014</i></span>	

- Finance IT Department, ShekMun
- Supervisor: Mr. Robin Kong
- Automatic Transaction System Stability Examination
- Advancement in Annual Reporting System

EDUCATION      **M.S., Computer Science**, Brown University      *Jan. 2018 - Present*

- Core Courses:
  - CS1670 Operating System by Prof. Tom W. Doepner : **A**
  - CS1510 Cryptography by Prof. Anna Lysyanskaya : **A**
- CGPA: 4.0

**B.S., Computer Science**, City University of Hong Kong      *Sep. 2012 - Feb. 2017*

- Honored Degree
- Core Courses: Data Structures, Design and Analysis of Algorithms, Operating System, Software Design, Machine Learning, Internet Application Programming, Computer Networks, Computer Organizations, Database Systems
- CGPA: 3.18

PROJECTS  
EXPERIENCE

- Return-to-libc attack on Linux x86      *Apr 2018*

SELF-CONDUCTED PROJECT

*Brown University, Providence*

- Bypass non-executable stack using return address in libc.so
- **Keywords:** Binary exploitation, buffer overflow

- Stack smash attack on Linux x86      *Apr 2018*

SELF-CONDUCTED PROJECT

*Brown University, Providence*

- Gain root via stack overflow on a program marked setuid
- **Keywords:** Binary exploitation, buffer overflow

- VFS (Virtual File System)      *Apr 2018*

COURSE PROJECT

*Brown University, Providence*

- Weenix (Unix-like OS) virtual file system
- **Keywords:** File System

- Mthread      *Apr 2018*

COURSE PROJECT

*Brown University, Providence*

- User-level multi-threading library backed by multiple LWP (Light Weight Process)
- **Keywords:** Multi-threading

- Uthread      *Apr 2018*

COURSE PROJECT

*Brown University, Providence*

- User-level multi-threading library backed by one LWP (Light Weight Process)
- **Keywords:** Multi-threading

- Gash - GArbled SyntHesizer (for secure multi-party computation)      *Apr 2018*

RESEARCH PROJECT

*Brown University, Providence*

- Compile c-like function to binary circuit in AIG(And-Inverter Graph)-like format
- Execute Yao's protocol on fixed-key AES
- Support 64-bit value
- See [www.github.com/xttjsn/gash](http://www.github.com/xttjsn/gash) for details
- **Keywords:** Garbled Circuit, Circuit Compilation

- Autonomous Evolution: Deep Reinforcement Learning in Simulated Car Test *Nov 2016*  
SELF-CONDUCTED PROJECT *CityU, HK*
  - Implement a Deep Q-learning Network
  - Build simulation with real world physics system using Box-2D
  - **Keywords:** Reinforcement learning, DQN, Autonomous Car, Simulation Test, Game AI, Box-2D
  
- Mobile Multi-Digit Inference System *Sep - Nov 2016*  
SELF-CONDUCTED PROJECT *CityU, HK*
  - Design individual loss function for each digit and digit length
  - Build a mobile app with live inference capability
  - Organize 18 convolutional and dense layers
  - **Keywords:** Deep Neural Network, Multi-Digit Prediction, Mobile App, Tensorflow
  
- Learn By Failure: Tic Tac Toe AI *Nov 2016*  
SELF-CONDUCTED PROJECT *CityU, HK*
  - Implementing Q-learning algorithms
  - Design an recursive function to explore all game states within  $O(n)$
  - Develop both CMD and GUI interface
  - **Keywords:** Q-learning, MDP, Reinforcement Learning, Game AI, PyGame
  
- Kaggle Comp: High Dimensional Prediction With Anonymous Feature *Oct - Nov 2016*  
COURSE PROJECT *CityU, HK*
  - Use Gradient Boosting to handle high dimensional data
  - Visualize gradient distribution
  - **Keywords:** Supervised Learning, Regression, Gradient Boosting, Feature Anonymity
  
- Kaggle Comp: Airline Tweet Sentimental Analysis *Oct 2016*  
COURSE PROJECT *CityU, HK*
  - Top 3 in accuracy
  - Design a robust preprocessing system
  - Combine KPCA and LinearSVM
  - **Keywords:** Supervised Learning, Text Classification, Sentimental Analysis
  
- Kaggle Comp: Movie Similarity Analysis With Auto Feature Selection *Oct 2016*  
COURSE PROJECT *CityU, HK*
  - Top 2 in accuracy
  - Maximize feature usage by adding word embeddings
  - Use pair-wise Euclidean distance
  - **Keywords:** Unsupervised Learning, Similarity Analysis, Word Embedding
  
- Titanic Passenger Survival Prediction *Sep 2016*  
COURSE PROJECT *CityU, HK*
  - Use optimized random forest
  - Use hand-crafted decision tree for interpretation
  - **Keywords:** Supervised Learning, Classification, Decision Tree

- Self-Drive Cab AI Design *Sep 2016*  
 SELF-CONDUCTED PROJECT *CityU, HK*
  - Implement Q-learning for optimized states
  - State interpretation: safer than faster
  - Build GUI for game
  - **Keywords:** Q-learning, Reinforcement Learning, PyGame, Discrete Policy Inference
  
- Novel Author Authenticity Discrimination *Jul 2016*  
 SELF-CONDUCTED PROJECT *CityU, HK*
  - Propose *Habit of Auxliary Word* as feature
  - Solve a historical question of *Dreams in Red Mansion*
  - **Keywords:** Cross Validation, Supervised Learning, Word Count, Term Frequency - Inverse Document Frequency
  
- OldCR - Training OCR For Old Book Scans *May 2016*  
 FINAL YEAR PROJECT *CityU, HK*
  - Propose *Manufacture Dataset with Artifacts*
  - Pixel level image manipulation
  - **Keywords:** sklearn, Python Image Library, Web Dev, Active Learning
  
- Evolution - A Simple yet Additive Game *Mar 2016*  
 SELF-CONDUCTED PROJECT *CityU, HK*
  - Simple rule - two elements combines to new
  - Big database of 350 elements
  - **Keywords:** 2D Game, PyGame, Web Dev, Node.js
  
- Playing Music Without Instrument - Magic Glove *Jul 2015*  
 INTEL CUP UNDERGRADUATE DESIGN CONTEST *SJTU, Shanghai*
  - Top 3 among 50 candidates
  - Use gyroscope and accelerometer to monitor finger position
  - **Keywords:** Arduino, Manufacture, Design, C++
  
- Freeze Frame - Extreme Environment Research in Antarctica *Dec 2014*  
 EXPEDITION & EXHIBITION *CityU, HK*
  - Construct 3D model from photos
  - Address Environmental Issues: Drifting garbage and global warming
  - **Keywords:** Science as Art, Vertex Tracing, UV Mapping, 3D Modelling

#### TECHNICAL STRENGTHS

<b>Computer Language</b>	C++	Python	
<b>Machine Learning</b>	sklearn	Tensorflow	Keras
<b>Game Tech</b>	Unreal		

INVOLVEMENT	• Weekly sharer of CUPA(CityU Postgraduate Association) Reading Club	<i>2016 - Present</i>
	• Co-editor of CodingPy (A local digital technical magazine on Python)	<i>2016 - Present</i>
	• Member of Hong Kong Mountain Climbing Club	<i>2014 - Present</i>
	• Committee of Mainland Student Association, City University of Hong Kong	<i>2012 - 2014</i>
	• Tutor and Ambassador of CityU Empowerment Project (Education service for students with disabilities)	<i>2012 - 2014</i>
AWARDS	• Dean's List, City University of Hong Kong	<i>2012 - 2013</i>
	• Best Project, Antarctica Expedition Exhibition Award	<i>2014</i>
	• 3rd Prize, Intel Embedded System Competition	<i>2014</i>
	• Fellowship in CityU Mainland Excellent Students	<i>2012 - 2015</i>
	• Trailwalker Award - Oxfam Trailwalker Hong Kong	<i>2016</i>
	• Cyclor Award - Cycle For Millions, ShangCom Bank, Hong Kong	<i>2016</i>
MORE INFORMATION	More information can be found at <a href="http://xttjsn.github.io/">http://xttjsn.github.io/</a> .	