

# XI HE

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## RESEARCH INTERESTS

My research interests span the areas of privacy and security for big-data management and analysis, with a current focus on (i) designing strong and useful privacy models for data-driven applications with theoretical understanding on the trade-offs between privacy and usability of applications and (ii) building practical systems that enable learning of useful information from the data while provably ensuring individuals' privacy.

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## EDUCATION HISTORY

PhD in Computer Science, **Duke University, Durham, NC, USA** 2012-Present  
Thesis Advisor: Ashwin Machanavajjhala

BS in Mathematics with Honors & BCS with Honors, **National University of Singapore, Singapore** 2008-2012  
Thesis Advisor: Y.C. Tay

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## HONORS AND AWARDS

- H-1. **Google PhD Fellowship in Privacy and Security**, Google 2017
- H-2. **Best Demo Award**, VLDB Conference 2016
- H-3. **Participant at 2016 Rising Stars Workshop**, Carnegie Mellon University 2016
- H-4. **Outstanding PhD Research Initial Project Award**, Duke University 2014
- H-5. **Members of the U.S. Delegation to the 2nd HLF**, Heidelberg Laureate Forum Foundation 2014
- H-6. **GHC Scholarship Grant**, Grace Hopper Celebration of Women in Computing 2014
- H-7. **Science Bursary Award**, National University of Singapore 2010 - 2012
- H-8. **School of Computing Alumni Assistant Award**, National University of Singapore 2010
- H-9. **Dean's List**, Faculty of Science, National University of Singapore 2008 - 2009
- H-10. **Dean's List**, School of Computing, National University of Singapore 2008 - 2009
- H-11. **Gold Medalist**, Singapore Mathematics Olympiad (Open) 2006
- H-12. **Gold Medalist**, Singapore Mathematics Olympiad (Senior) 2004

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## PUBLICATIONS

### CONFERENCE.

- P-1. *Xi He*, Ashwin Machanavajjhala, Cheryl Flynn, Divesh Srivastava, "Composing Differential Privacy and Secure Computation: A Case Study on Scaling Private Record Linkage". In ACM Conference on Computer and Communications Security *CCS*, 2017.
- P-2. *Xi He*, Graham Cormode, Ashwin Machanavajjhala, Cecilia M. Procopiuc, Divesh Srivastava, "DPT: Differentially Private Trajectory Synthesis using Hierarchical Reference Systems". In International Conference on Very Large Data Bases *VLDB*, 2015.
- P-3. *Xi He*, Ashwin Machanavajjhala, Bolin Ding, "Blowfish Privacy: Tuning Privacy-Utility Trade-offs using Policies". In ACM Special Interest Group on Management of Data *SIGMOD*, 2014.

### BOOK CHAPTER.

- P-4. Ashwin Machanavajjhala, *Xi He*, "Analyzing Your Location Data with Provable Privacy Guarantees". Chapter in *Springer Handbook on Mobile Data Privacy*. To appear 2017.

**POSTER & DEMO.**

- P-5. *Xi He*, Nisarg Raval, Ashwin Machanavajjhala, “A Demonstration of VisDPT: Visual Exploration of Differentially Private Trajectories”. In International Conference on Very Large Data Bases *VLDB*, 2016.
- P-6. *Xi He*, Ashwin Machanavajjhala, Cheryl Flynn, Divesh Srivastava, “Composing Differential Privacy and Secure Multiparty Computation for Efficient Private Record Linkage”. In Theory and Practice of Differential Privacy *TPDP*, part of International Conference on Machine Learning *ICML*, 2016.

**JOURNAL.**

- P-7. Y.C. Tay, Xuanran Zong, *Xi He*, “An Equation-Based Heap Sizing Rule”. In *Performance Evaluation*, 2013.

**SUBMITTED & PENDING PAPERS.**

- P-8. “Investigating Statistical Privacy Frameworks from the Perspective of Hypothesis Testing”, with Changchang Liu, Thee Chanyaswad, and Prateek Mittal. In submission to IEEE Symposium on Security and Privacy.
- P-9. “Private Exploration Primitives for Data Cleaning”, with Chang Ge, Ihab Ilyas, and Ashwin Machanavajjhala. In preparation for International Conference on Very Large Data Bases *VLDB*.

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**RESEARCH AND WORK EXPERIENCE**


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- W-1. Research Intern, *Microsoft Research, USA*, July 2016 - Sep 2016. Collaborated on research project “Efficient Join Query Approximation” with Srikanth Kandula.
- W-2. Research Intern, *AT&T Labs Research, USA*, June 2014 - Aug 2014, June 2013 - Aug 2013. Collaborated on “Differential Privacy for Location Data” with Divesh Srivastava, Ramón Cáceres and Cecilia M. Procopiuc.
- W-3. Technology Intern, *Barclays, Singapore*, May 2012 - July 2012. Designed and implemented new automated features for the Bchat Bot Agent including regular announcement making and Q&A, for the Global Technology Infrastructure and Service division; organized the volunteer event “Magical Flyer” with Movement for the Intellectually Disabled of Singapore as Barclays Intern Committee.
- W-4. Operation and Technology Intern, *Standard Chartered Bank, Singapore*, Dec 2009, May 2010 - July 2010. Built a webpage portal application for SCB global Unix Team to view server states.

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**MENTORING AND TEACHING EXPERIENCE**


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- M-1. Annie Xie, North Carolina School of Science and Mathematics (NCSSM) Mentorship program. Graduate Student Mentor, 2015-2016.
- M-2. “Differential Privacy in the Wild: a tutorial on current practices & open challenges”. Tutorial, with Ashwin Machanavajjhala and Michael Hay. In *SIGMOD*, 2017.
- M-3. “Differential Privacy in the Wild: a tutorial on current practices & open challenges”. Tutorial, with Ashwin Machanavajjhala and Michael Hay. In *VLDB*, 2016.
- M-4. “PrivateClean: Data Cleaning & Differential Privacy”. Guest Lecturer in “CompSci 590.01: Data Cleaning & Integration” instructed by Prof. Jun Yang, Duke University, Spring 2017.
- M-5. “Data Streams”. Guest Lecturer in “CompSci 216: Everything Data” instructed by Prof. Ashwin Machanavajjhala, Duke University, Spring 2017.
- M-6. “Differentially Private Empirical Risk Minimization”. Guest Lecturer in “CompSci 590.03: Privacy in a Mobile-Social World” instructed by Prof. Ashwin Machanavajjhala, Duke University, Fall 2016.
- M-7. “Data Privacy”. Guest Lecturer in “CompSci 516: Data Intensive Computing Systems” instructed by Prof. Sudeepa Roy, Duke University, Spring 2016.
- M-8. “CompSci 590.02: Algorithms for Big Data”. Teaching Assistant, instructed by Prof. Ashwin Machanavajjhala, Duke University, Fall 2015.
- M-9. “CompSci 230: Discrete Mathematics for Computer Science”. Teaching Assistant with instructor Prof. Susan Rodger, Duke University, Fall 2013.
- M-10. “Discrete Mathematics”. Teaching Assistant with instructor Prof. Stéphane Bressan, National University of Singapore, Fall 2011.

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## SELECTED TALKS

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- T-1. “Leave No Trace: Location Data with Provable Privacy Guarantees”. Invited Speaker at Computer Science & Engineering Colloquium, UT Arlington, Fall 2017.
- T-2. “Privacy with Constraints: Opportunities & Challenges”. Invited Speaker at Theory and Practice of Differential Privacy *TPDP*, part of CCS, Fall 2017.

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## PROFESSIONAL SERVICES AND LEADERSHIP

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**External Reviewer.** VLDB (2014-2017), SIGMOD (2014-2017), International Colloquium on Automata, Languages, and Programming (ICALP) (2017), Proceedings on Privacy Enhancing Technologies (PoPETS) (2017), IEEE Symposium on Privacy-Aware Computing (PAC) (2017), IEEE International Conference on Data Engineering (ICDE) (2017)

**Reviewer.** PoPETS (2017), IEEE Computer Security Foundations Symposium (2017), Knowledge and Information Systems (2017), Fundamenta Informaticae (2017).

**Professional Affiliations.** Member of ACM, Committee member of ACM-W Duke University Chapter (president in 2015, vice president in 2014,2016,2017).