

HANCHENG CAO

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EDUCATION

Stanford University

Ph.D. in Computer Science

Stanford, CA

Sep 2018 – Jun 2023 (Expected)

- Research Interest: Data Science, Computational Social Science
- Advisors: [Prof. Dan McFarland](#), [Prof. Dan Jurafsky](#)

Tsinghua University

B.Eng. in Electronic Engineering (with honors)

Beijing, China

Aug 2014 – Jun 2018

- Selected to Spark Scientific and Technological Innovation Fellowship (top 1.5% of 3560 Tsinghua students for outstanding research performance)

University of Maryland, College Park

Exchange Student

College Park, MD, USA

Aug 2016 – Dec 2016

Massachusetts Institute of Technology

Visiting Student at MIT Media Lab

Cambridge, MA, USA

Jun 2017 – Sep 2017

PUBLICATIONS

1. **H. Cao***, Z. Chen*, F. Xu, Y. Li, T. Wang. When Your Friends Become Sellers: An Empirical Study of Social Commerce Site Beidian. In the 14th International AAAI Conference on Web and Social Media (ICWSM 2020). [\[pdf\]](#)
2. **H. Cao**, Z. Chen, F. Xu, Y. Li, V. Kostakos. Revisitation in Urban Space vs. Online: A Comparison across POIs, websites, and Smartphone Apps. In 2019 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2019). [\[pdf\]](#)
3. **H. Cao**, J. Feng, Y. Li, V. Kostakos. Uniqueness in the City: Urban Morphology and Location Privacy. In 2018 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2018). [\[pdf\]](#)
4. **H. Cao**, F. Xu, J. Sankaranarayanan, Y. Li, H. Samet. Habit2vec: Trajectory Semantic Embedding for Living Pattern Recognition in Population. In IEEE Transactions on Mobile Computing (TMC). [\[pdf\]](#)
5. **H. Cao**, J. Sankaranarayanan, J. Feng, Y. Li, H. Samet. Understanding Metropolitan Crowd Mobility via Mobile Cellular Accessing Data. In ACM Transactions on Spatial Algorithms and Systems (TSAS). [\[pdf\]](#)
6. M. Zeng, **H. Cao**, M. Chen, Y. Li. User Behavior Modeling, Recommendations, and Purchase Prediction during Online Shopping Festivals. In Springer Electronic Markets (EM). [\[pdf\]](#)
7. H. Shi, **H. Cao**, X. Zhou, Y. Li, V. Kostakos, F. Sun, F. Meng, C. Zhang. Semantics-Aware Hidden Markov Model for Human Mobility. In 2019 SIAM International Conference on Data Mining (SDM 2019). [\[pdf\]](#)
8. H. Shi, Y. Li, **H. Cao**, X. Zhou, V. Kostakos, C. Zhang. Semantics-Aware Hidden Markov Model for Human Mobility. In IEEE Transactions on Knowledge and Data Engineering (TKDE). Extended version of SDM 2019 paper. [\[pdf\]](#)
9. F. Xu, T. Xia, **H. Cao**, Y. Li, F. Sun, F. Meng. Detecting Popular Temporal Modes in Population-scale Unlabelled Trajectory Data. In 2018 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2018). [\[pdf\]](#)

WORKING PAPERS

10. **H. Cao***, Z. Cen*, M. Cheng*, X. Ren, D. McFarland. Will This Idea Spread Beyond Academia?: Understanding and Forecasting Knowledge Transfer from Research to Practice. In submission.
11. Z. Chen, **H. Cao**, H. Wang, F. Xu, Y. Li, V. Kostakos. Will You Come Back?: Understanding Characteristics Leading to Urban Revisitation. In submission.
12. T. Zhen, **H. Cao**, E. Lagerspetz, H. Flores, S. Tarkoma, P. Nurmi, Y. Li. Exploring and Understanding User Long-term App Usage Dynamics with Socioeconomic Attributes. In submission.
13. T. Li, M. Zhang, **H. Cao**, Y. Li, S. Tarkoma, P. Hui. "What Apps Did You Use?": Understanding the Long-term Evolution of Mobile App Usage. In submission.
14. J. Lin, H. Wang, Y. Li, **H. Cao**, D. Jin. Context-Aware Semantic Annotation of Mobility Records. In submission.

* Indicates equal contribution.

RESEARCH EXPERIENCE

Stanford University (Graduate School of Education)

Research Assistant to [Prof. Dan McFarland](#), [Prof. Dan Jurafsky](#)

Stanford, CA, USA

Apr 2019 – Now

Data Science for Science of Science

- Series of projects aiming at understanding the laws governing scientific advance through mining text data from millions of academic papers and patents.

Stanford University (Department of Computer Science)

Stanford, CA, USA

Research Assistant to [Prof. Michael Bernstein](#), [Prof. Melissa Valentine](#), [Prof. Julien Clement](#)

Jan 2019 – Apr 2019

Data Science for Organization Behavior

- Winter rotation project aiming at understanding the interplay between dynamic team interaction and member performance/happiness through digital records of freelance software engineers teams.

Stanford University (Department of Computer Science)

Stanford, CA, USA

Research Assistant to [Prof. Jure Leskovec](#)

Sep 2018 – Dec 2018

Data Science for Health

- Fall rotation project aiming at understanding the fundamental characteristics of people's daily eating habits through large-scale (~TB) log data of a health tracking app.

Massachusetts Institute of Technology (Media Lab)

Cambridge, MA, USA

Research Assistant to [Prof. Alex 'Sandy' Pentland](#) and [Prof. Xiaowen Dong](#)

Jun 2017 – Sep 2017

Purchasing Pattern Recognition in Metropolis

- Project aiming at recognizing typical purchasing patterns in population from large-scale credit card transaction data via representation learning based method and Monte Carlo Simulation

University of Maryland (Department of Computer Science)

College Park, MD, USA

Research Assistant to [Prof. Hanan Samet](#), University Distinguished Professor

Sep 2016 – Jun 2017

Spatial Temporal Routine Mining

- Projects on living pattern recognition in population and frequent pattern mining of crowd mobility.

Tsinghua University (Department of Electronic Engineering)

Beijing, China

Research Assistant to [Prof. Yong Li](#), Future Communications & Internet Lab

Sep 2015 – Aug 2018

Faculty collaborator: [Prof. Vassilis Kostakos](#) (University of Melbourne)

Project 1 - User Behavior Analytics on Social Commerce

- Carry out first ever large-scale measurement study on fast growing social commerce platform.

Project 2 – Urban Computing through Spatial Temporal Big Data

- Series of projects that leverages spatial temporal data from mobile operators and location-based social network to study human mobility pattern, location prediction and location privacy.

INDUSTRY EXPERIENCE

Tencent Inc.

Beijing, China

Research Intern, Tencent Map Service, Mobile Internet Group

July 2018 – Sep 2018

User Check-in Behavior Analysis

- Analyzed user in town and out of town check-in behavior patterns
- Proposed representation learning based algorithms to embed user and POI for location recommendation.
- Results leveraged in Tencent product.

TEACHING EXPERIENCE

- Course Assistant (CA), [CS221: Artificial Intelligence: Principles and Techniques](#), Fall 2019.

SELECTED AWARDS AND HONORS

- SIGCHI Student Travel Grant, 2019
- The James D. Plummer Graduate Fellowship – a School of Engineering (SoE) Fellowship, Stanford University, 2018
- UbiComp Student Travel Grant, 2018
- Beijing Outstanding Graduate Award, 2018 (Highest honor for graduate set by the government of Beijing)
- Outstanding Graduate Award, Tsinghua University, 2018
- China National Scholarship, 2017 (Highest level of scholarship set by the government of China)
- Qualcomm Scholarship, 2017 (Awarded to top 33 of 2562 applicants with excellent scientific potential)

- The China Scholarship Council (CSC) Scholarship, 2016
- Zhang Mingwei Scholarship, 2016 (Awarded to students for outstanding academic performance)
- Changhong Scholarship, 2015 (Awarded to students for outstanding academic performance)
- Philobiblion Scholarship, 2016 (0.5% of 1000 applicants)
- Tsinghua Comprehensive Excellence Award, 2015–17 (Top 5% of 262 students)
- Tsinghua Research Excellence Award, 2015–17 (Top 5% of 262 students)
- Tsinghua Academic Excellence Award, 2015–17 (Top 5% of 262 students)
- 1st Prize for the 32rd National Undergraduate Physics Olympic, 2015 (Top 1%)

INVITED TALKS

- Mining Human Mobility Patterns and Urban Dynamics through Spatial Temporal Big Data, *University of Warwick*, Sep 2019
- Mining Human Mobility Patterns and Urban Dynamics through Spatial Temporal Big Data, *Wayve.ai*, Sep 2019
- Revisitation in Urban Space vs. Online: A Comparison across POIs, websites, and Smartphone Apps, *UbiComp 2019*
- Uniqueness in the City: Urban Morphology and Location Privacy, *UbiComp 2018*

ACADEMIC SERVICES

- **Program Committee Member:** AAAI ICWSM 2020
- **Reviewer:** ACM CHI 2020, ACM UbiComp 2020, AAAI ICWSM 2020, ACM UbiComp 2019, ACM IMC 2018
- **Session Chair:** UbiComp 2019 CPD workshop
- **Student Volunteer:** UbiComp/ISWC 2018

ADDITIONAL INFORMATION

- **Extracurricular activities:** Clavier Team of Tsinghua Student Art Troupe, (Member: 2014 – 2018; Vice Captain 2015 – 2016), Tsinghua Science and Technology Association (Member: 2015 – 2016)
- **Computer skills and proficiencies:** C/C++, MATLAB, Python, R, SQL, D3.js, Data Structure and algorithms, Data Scraping, Machine Learning, LATEX
- **Language skills and proficiencies:** Mandarin Chinese (Native); English (Proficient: TOEFL 117/120); German (Elementary)