HANCHENG CAO

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EDUCATION

Stanford University Stanford, CA
Ph.D. in Computer Science, minor in Management Science & Engineering Sep 2018 – Jun 2023 (Expected)

- Research Interest: Data Science, Computational Social Science, Human Computer Interaction
- Advisors: Prof. Dan McFarland, Prof. Dan Jurafsky
- Stanford Interdisciplinary Graduate Fellow

Tsinghua University Beijing, China
B.Eng. in Electronic Engineering (with honors) 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 College Park, MD, USA
Exchange Student Aug 2016 – Dec 2016

Massachusetts Institute of Technology Cambridge, MA, USA
Visiting Student at MIT Media Lab Jun 2017 – Sep 2017

PUBLICATIONS

1. **H. Cao**, C. Lee, S, Iqbal, M. Czerwinski, P. Wong, S. Rintel, B. Hecht, J. Teevan, L. Yang, Large Scale Analysis of Multitasking Behavior During Remote Meetings. In ACM CHI Conference on Human Factors in Computing Systems (CHI 2021). Full paper. **Best Paper Honorable Mention Award** [pdf]
2. **H. Cao***, Z. Chen*, Y. Deng, X. Gao, J. Piao, F. Xu, Y. Zhang, Y. Li, Learning from Home: A Mixed-Methods Analysis of Live Streaming Based Remote Education Experience in Chine Colleges during the COVID-19 Pandemic. In ACM CHI Conference on Human Factors in Computing Systems (CHI 2021). Full paper. [pdf]
3. **H. Cao***, Z. Chen*, M. Cheng, S. Zhao, T. Wang, Y. Li. You Recommend, I Buy: How and Why People Engage in Instant Messaging Based Social Commerce. In 2021 ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2021). Full paper. [pdf]
4. G. Zhang*, Y. Li*, Y. Yuan*, F. Xu, **H. Cao**, L. Zhou, D. Jin. Community Value Prediction in Social E-Commerce. In 2021 ACM Web Conference (WWW 2021). Long paper. [pdf]
5. Y. Yuan, F. Xu, **H. Cao**, G. Zhang, Y. Li, D. Jin. Persuade to Click: Modeling Context-aware Persuasion in online Product Recommendation Text. In IEEE Transactions on Knowledge and Data Engineering. [pdf]
6. Y. Fan, Z. Tu, T. Li, **H. Cao**, T. Xia, Y. Li, X. Chen, L. Zhang, Understanding the Long-term Dynamics of Mobile App Usage Context via Graph Embedding, in IEEE Transactions on Knowledge and Data Engineering (TKDE). [pdf]
7. H. Wang, Y. Li, J. Lin, **H. Cao**, D. Jin. Context-Aware Semantic Annotation of Mobility Records. In ACM Transactions on Knowledge Discovery from Data (TKDD). [pdf]
8. **H. Cao**, V. Chen, V. Yang, Y. Lee, L. Stone, M. Whiting, M. Bernstein. My Teams Will Go On: Differentiating High and Low Viability Teams through Team Interaction. In 2020 ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2020). Full paper. **Best Paper Honorable Mention Award**. [pdf]
9. Z. Chen, **H. Cao**, M. Cheng, F. Xu, T. Wang, Y. Li. Understanding the Role of Intermediaries in Online Social E-commerces: An Exploratory Study of Beidian. In 2020 ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2020). Full paper. [pdf]
10. **H. Cao***, M. Cheng*, Z. Cen*, X. Ren, D. McFarland. Will This Idea Step Beyond Academia?: Understanding and Predicting Knowledge Transfer from Research to Practice. In 2020 Conference on Empirical Methods in Natural Language Processing Findings (EMNLP 2020 Findings). [pdf]
11. Z. Lin, S. Lyu, **H. Cao**, F. Xu, P. Hui, H. Samet, Y. Li. HealthWalks: Sensing Fine-grained Individual Health Condition via Mobility Data. In 2021 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2021). Full paper. [pdf]
12. Z. Chen, **H. Cao**, H. Wang, F. Xu, Y. Li, V. Kostakos. Will You Come Back?: Understanding Characteristics Leading to Urban Revisitation. In 2020 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2020). Full paper. [pdf]
13. **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). Full paper. [pdf]

14. 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 2020 ACM Web Conference (WWW 2020). Long paper. [pdf]
15. 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 Springer Transactions on Pervasive Computing and Interaction (TPCI). [pdf]
16. **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). Full paper. [pdf]
17. **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). Full paper. [pdf]
18. **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]
19. **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]
20. 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]
21. 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). Long paper. [pdf]
22. 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]
23. 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). Full paper. [pdf]

WORKING PAPERS

24. M. Cheng, **H. Cao**, X. Ren, S. Smith, D. McFarland. Modeling the Diffusion of Novel Ideas: The Variable Careers of New Scientific Concepts. Revise and resubmit at American Sociological Review (ASR).
25. B. Jin, Z. Liu, **H. Cao**, Y. Li, J. Yang, X. Xie. KDNR: Knowledge-Fused Deep Disentangled Representation Learning for News Recommendation. In submission to 2021 Knowledge Discovery and Data Mining Conference (KDD 2021).

* Indicates equal contribution.

RESEARCH EXPERIENCE

Stanford University (Graduate School of Education) Stanford, CA, USA
Research Assistant to Prof. Dan McFarland, Prof. Dan Jurafsky Apr 2019 – Now
Data Science for Science of Science

- Series of projects aiming at understanding the laws governing scientific innovations and collaborations through mining text and metadata from millions of academic papers, patents, clinical trials, news and social media.

Stanford University (Department of Computer Science) Stanford, CA, USA
Research Assistant to Prof. Michael Bernstein, Prof. Melissa Valentine, Prof. Julien Clement Jan 2019 – Now
Data Science for Organization Behavior

- Series of projects aiming at understanding the interplay between dynamic team interaction and member performance/happiness through experiments and 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

- Series of projects on studying fast growing social commerce platform – a novel and increasingly popular category of CSCW platform where ordinary people are turned into sellers to achieve collective economic value.

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

Microsoft New York City, NY, USA
Research Intern, Computational Social Science Group, Microsoft Research Jun 2021 – Sep 2021
Mentors: Jake Hofman, Dan Goldstein
Perspective Engine

- Leverage natural language processing to recommend perspectives for people to better understand large numeric value.

Microsoft Redmond, WA, USA
Research Intern, E & D Office of Applied Research & Microsoft Research Jun 2020 – Sep 2020
Mentors: Longqi Yang, Chia-Jung Lee, Jaime Teevan, Brent Hecht, Shamsi Iqbal, Mary Czerwinski
Remote Work Analysis during COVID-19 Pandemic

- Analyzed user collaboration and work patterns under remote work setting through large-scale telemetry data on communication and productivity tools.

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), CS124: From Languages to Information, taught by Prof. Dan Jurafsky, Winter 2019-2020.
- Course Assistant (CA), CS221: Artificial Intelligence: Principles and Techniques, taught by Prof. Percy Liang & Prof. Dorsa Sadigh, Fall 2019-2020.

SELECTED AWARDS AND HONORS

- Stanford Interdisciplinary Graduate Fellow, 3 year full tuition + stipend coverage, 1 of 33 graduate student awardees, university-wide, in cohort
- Stanford Friends of Music Scholarship (Harpsichord), 2021
- ACM CHI 2021 Best Paper Honorable Mention Award, 2021
- ACM CSCW 2020 Best Paper Honorable Mention Award, 2020
- 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%)

PRESENTATIONS

- A Computational Approach to Understand Micro Dynamics of Remote Collaboration, Dropbox, Nov 2021
- You Recommend, I Buy: How and Why People Engage in Instant Messaging Based Social Commerce, CSCW 2021
- My Teams Will Go On: Differentiating High and Low Viability Teams through Team Interaction, *AI Pioneer Conference (Chinese),* Aug 2021
- Large Scale Analysis of Multitasking Behavior During Remote Meetings, *Tsinghua Boston Alumni Association*, Aug 2021
- My Teams Will Go On: Differentiating High and Low Viability Teams through Team Interaction, *University of Washington DUB*, July 2021
- My Teams Will Go On: Differentiating High and Low Viability Teams through Team Interaction, *IC2S2 2021*
- Large Scale Analysis of Multitasking Behavior During Remote Meetings, IC2S2 2021
- Large Scale Analysis of Multitasking Behavior During Remote Meetings, CHI 2021
- Will This Idea Step Beyond Academia?: Understanding and Predicting Knowledge Transfer from Research to Practice, *Networks 2021*
- Mining Human Mobility Patterns and Urban Dynamics through Spatial Temporal Big Data, *University of Tokyo*, Feb 2021
- Will This Idea Step Beyond Academia?: Understanding and Predicting Knowledge Transfer from Research to Practice, *EMNLP 2020 SDP Workshop*
- My Teams Will Go On: Differentiating High and Low Viability Teams through Team Interaction, *CSCW 2020*
- Rediscovering Aristotle: Are we creating new science or repackaging old science?, *ASA Annual Meeting 2020*
- Modeling the Diffusion of Novel Ideas: The Variable Careers of New Scientific Concepts, *ASA Annual Meeting 2020*
- Will This Idea Step Beyond Academia?: Understanding and Predicting Knowledge Transfer from Research to Practice, *IC2S2 2020*
- When Your Friends Become Sellers: An Empirical Study of Social Commerce Site Beidian, *ICWSM 2020*
- 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 2021, AAAI ICWSM 2020
- **Reviewer:** ACM CHI 2020, ACM CSCW 2020, ACM UbiComp 2020, AAAI ICWSM 2020, ACM MobileHCI 2020, ACM UbiComp 2019, ACM IMC 2018, IEEE TMC
- **Facilitator:** Microsoft New Future of Work 2020 Symposium
- **Session Chair:** UbiComp 2019 CPD workshop
- **Student Volunteer:** CSCW 2020, 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)