TONGXIN LI

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School of Data Science
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MAILING ADDRESS

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RESEARCH INTERESTS

- Power systems
- Online algorithms, machine learning

EDUCATION

California Institute of Technology, Pasadena   *2017* OCT - *2022* JULY
- Ph.D. in Computing and Mathematical Sciences (admitted in Electrical Engineering)
- Dissertation topic: "Learning-augmented control and decision-making in smart grids"
- *2022 SIGEnergy Doctoral Dissertation Award (honorable mention)*

The Chinese University of Hong Kong, Shatin   *2011* SEP - *2017* OCT
- M.Phil. in Information Engineering
- B.Sc. in Mathematics
- B.Eng. in Information Engineering

EMPLOYMENT

The Chinese University of Hong Kong, Shenzhen   *2022* AUG - PRESENT
Assistant Professor, Presidential Young Fellow   SCHOOL OF DATA SCIENCE

Amazon Web Services, Virtual   *2021* JULY - *2021* OCT
Applied scientist intern (with return offer)   CLOUD SECURITY

Amazon Web Services, Virtual   *2020* JUNE - *2020* SEP
Applied scientist intern   CLOUD SECURITY

École Polytechnique Fédérale de Lausanne, Lausanne   *2015* JUN - *2015* SEP
Summer Intern   COMPUTER AND COMMUNICATION SCIENCES

Carnegie Mellon University, Pittsburgh   *2014* JUN - *2014* SEP
Summer Intern   ELECTRICAL AND COMPUTER ENGINEERING

Journals

1. **Li T**, Sun B, Chen Y, Ye Z, Wierman A, Low SH *" Learning-Based Predictive Control via Real-Time Aggregate Flexibility"*, IEEE Transactions on Smart Grids, 12 (6), pp. 4897-4913, 2021.

2. **Li T**, Chen Y, Sun B, Wierman A, Low SH *"Information Aggregation for Constrained Online Control"*, Proceedings of the ACM on Measurement and Analysis of Computing Systems, 5 (2), No.: 18, pp. 1–35, 2021.

3. **Li T**, Yang R, Qu G, Shi G, Yu C, Wierman A, Low SH *" Robustness and Consistency in Linear Quadratic Control with Predictions"*, Proceedings of the ACM on Measurement and Analysis of Computing Systems, 6(1), 1-35, 2022.

4. **Li T**, Werner L, Low SH *"Learning Graph Parameters from Linear Measurements: Fundamental Trade-offs and Applications"*, IEEE Transactions on Signal and Information Processing over Networks, 6, pp. 163-178, 2020.

5. **Li T**, Yang R, Qu G, Lin Y, Low SH, Wierman A *" Certifying Black-Box Policies with Stability for Non-linear Control"*, IEEE Open Journal of Control Systems, pp 49-62, 2023.

6. **Li T**, *"Out-of-Distribution-Aware Electric Vehicle Charging"*, submitted to IEEE Transactions on Sustainable Energy.

7. Chen Y, **Li T**, Zhao C, Wei W *"Decentralized Provision of Renewable Predictions within a Virtual Power Plant"*, IEEE Transactions on Power Systems, 36 (3), pp. 2652-2662, 2020.

8. Sun C, **Li T**, Low SH *"Classification of Electric Vehicle Charging Time Series based on Selective Clustering"*, Electric Power Systems Research, Elsevier, 189, pp. 106695, 2020.

9. Ye Z, **Li T**, Low SH *"Towards Balanced Three-phase Charging: Phase Optimization in Adaptive Charging Networks"*, Electric Power Systems Research, Elsevier, 212, pp. 108322, 2022.

10. Sun B, Alinia B, **Li T**, Hajiesmaili M, Wierman A, Tsang DHK *"Competitive Algorithms for the Online Multiple Knapsack Problem with Application to Electric Vehicle Charging"*, Proceedings of the ACM on Measurement and Analysis of Computing Systems, 4 (3), No.: 51, pp. 1–32, 2020.

11. Chen Y, **Li T**, Qiuwei Wu *"Equilibrium Analysis of Coupled Peer-to-Peer Energy Sharing Embedded Power System and Transportation System"*, *(major revision, IEEE Transactions on Transportation Electrification)*.

12. Sun C, **Li T**, Tang X *"A Data-Driven Approach for Optimizing Early-Stage Electric Vehicle Charging Station Placement*, IEEE Transactions on Industrial Informatics, pp. 1-11, 2023.

Conferences

1. Pre-print H Liu, **Li T**, Y Wang, Y Yue *"Information-Theoretic Latent Relational Abstraction"*, submitted to CLeaR 2024.

2. Pre-print Yang J, **Li T**, Wierman A, Ren S *"Reinforcement Learning for Online Competitive Control with Policy Priors"*, submitted to SIGMETRICS 2023.

3. **NeurIPS 2023 Li T**, Lin Y, Ren S, Wierman A *"Beyond Black-Box Advice: Learning-Augmented Algorithms for MDPs with Q-Value Predictions"*.

4. **NeurIPS 2023** Yang J, Li P, **Li T**, Wierman A, Ren S *"Anytime-Competitive Reinforcement Learning with Policy Prior"*.

5. **NeurIPS 2022** Lin Y, Yang H, Qu G, **Li T**, Wierman A *"Bounded-Regret MPC via Perturbation Analysis: Prediction Error, Constraints, and Nonlinearity"*.

6. **ACM SIGMETRICS 2022 Li T**, Yang R, Qu G, Shi G, Yu C, Wierman A, Low SH *"Robustness and Consistency in Linear Quadratic Control with Predictions"*.

7. IEEE PSCC 2022 Ye Z, **Li T**, Low SH *"Towards Balanced Three-phase Charging: Phase Optimization in Adaptive Charging Networks"*.

8. IEEE SmartGridComm 2021 Sun C, **Li T**, Tang X *"Data-driven Electric Vehicle Charging Station Placement for Incentivizing Potential Demand"*.

9. **ACM SIGMETRICS 2021** Sun B, Alinia B, **Li T**, Hajiesmaili M, Wierman A, Tsang DHK *"Competitive Algorithms for the Online Multiple Knapsack Problem with Application to Electric Vehicle Charging"*.

10. **ACM SIGMETRICS 2021 Li T**, Chen Y, Sun B, Wierman A, Low SH *"Information Aggregation for Constrained Online Control"*.

11. **ACM e-Energy 2020 Li T**, Low SH, Wierman A *"Real-time Flexibility Feedback for Closed-loop Aggregator and System Operator Coordination"*.

12. **ACM e-Energy 2020** Sun B, **Li T**, Low SH, Tsang DHK *"ORC: An Online Competitive Algorithm for Recommendation and Charging Schedule in Electric Vehicle Charging Network"*.

13. **ACM e-Energy 2019** Lee Z, **Li T**, Low SH *"ACN-Data: Analysis and Applications of an Open EV Charging Dataset"*.

14. NeurIPS Workshop on causal inference 2019 Liu H, Liu, A, **Li T**, Anandkumar A *"Disentangling Causal Effects from Latent Confounders using Interventions"*.

15. IEEE PSCC 2020 Sun C, **Li T**, Low SH *"Classification of Electric Vehicle Charging Time Series based on Selective Clustering"*.

16. IEEE CDC 2019 **Li T**, Werner L, Low SH *"Learning Graph Parameters from Linear Measurements: Fundamental Trade-offs and Application to Electric Grids"*.

17. IEEE ITW 2018 **Li T** *"Maximum likelihood upper bounds on the capacities of discrete information stable channel"*.

18. <u>IEEE ISIT 2018</u> **Li T**, Dey BK, Jaggi S, Langberg M, Sarwate AD *"Quadratically constrained channels with causal adversaries"*.

19. <u>IEEE DSW 2018</u> Sun C, **Li T**, Li VO *"Robust and consistent clustering recovery via SDP approaches"*.

20. <u>IEEE SPAWC 2016</u> *Invited Paper* **Li T**, Bakshi M, Grover P *"Fundamental limits and achievable strategies for low energy compressed sensing with applications in wireless communication"*.

21. <u>IEEE ISIT 2014</u> **Li T**, Chan CL, Huang W, Kaced T, Jaggi S *"Group testing with prior statistics"*.

INVITED TALKS AND SEMINARS (BY TOPICS)

Trustworthy Machine Learning for Power Systems in PES GM 2023

Impact of COVID-19 on Learning-Based Electric Vehicle Charging: Challenges and Solutions
- 2022 INFORMS Annual Meeting

Learning-augmented Decision-making and Control: Theory and Applications in Power Systems
- Algorithms with Predictions Seminar Course Talk, University of Massachusetts Amherst
- Seminar, HKUST, Guangzhou
- Seminar, CityU, Hong Kong
- Seminar, CUHK, Shenzhen

System Identification: Fundamental Trade-offs and Applications
- "*Model-based graph learning with linear measurements*" Southern California Applied Mathematics Symposium, April 27, 2019 (SOCAM 2019), April 27, 2019, Pasadena, USA
- (*Invited*) "*Learning graph parameters from linear measurements: Fundamental trade-offs and application to electric grids*" The 20th INFORMS Applied Probability Society Conference (INFORMS-APS 2019), July 3-5, 2019, Brisbane, Australia

Learning-based Information Aggregation for Large-scale Control
- (*Invited*) "*Learning Real-time Flexibility for Closed-loop Aggregator and System Operator Coordination*" The INFORMS 25th ANNIVERSARY, Nov 8-13, 2020, Virtual
- (*Invited*) "*Learning-based Predictive Control via Real-time Aggregate Flexibility*" The INFORMS 26th ANNIVERSARY, Oct 24-27, 2021, Anaheim, USA

Awards and Distinctions

2022 SIGEnergy Doctoral Dissertation Award (Honorable Mention)	*2022*
2021 Resnick Sustainability Institute Impact Grants	*2021*
NSF Graduate Research Fellowship	*2018-2022*
Croucher Summer Course in Information Theory (CSCIT 2017), Best Poster Award	*2017*
Dean's List of Science Faculty	*2012 - 2013, 2013 - 2014*
Top 10%/all students in double-degree program	
Head's List of United College	*2012 - 2013, 2013 - 2014*
Top 1/all college students	
HKSAR Government Scholarship	*2013 - 2014*
Undergraduate Mathematics Scholarship	*2013 - 2014*
At most 2 students per year	
T C Cheng Scholarship	*2013 - 2014*
Professor Charles K. Kao Research Exchange Scholarship	*2014* SUMMER
Around 10/2000 engineering students per year	
GOAL Programme Non-local Exchange Scholarship	*2014* SUMMER
Wu Chung Scholarship	*2012 - 2013*

Competitive Grants

National Natural Science Foundation of China (*Principal Investigator* and *Co-Investigator*)

Energy and Sustainability Young Talent Donation (*Principal Investigator*)

Selected Industry Projects

Advanced Research Projects Agency–Energy (ARPA-E): NODES *2018-2019*

- Simulate real-time OPF for demand response

Pasadena Water and Power Department (PWP) *2020-2021*

- Distribution network optimal battery placement for voltage regulation

Caltech Facilities *2021*-PRESENT

- Workplace decarbonization through real-time learning and optimization

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Patents

Systems and Methods for Adaptive EV Charging (US Patent Application: 16786803)

Inventors: Zachary J Lee, **Tongxin Li**, Steven H Low, Sunash B Sharma

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Teaching

The Chinese University of Hong Kong (Shenzhen)

Linear Agebra and Applications	Fall 2022

Advanced Machine Learning	Spring 2023, Spring 2024

Online Algorithms	Spring 2024

PROFESSIONAL SERVICES

Technical Program Committee:
- IEEE SmartGridComm 2023
- ICLR 2023 Workshop: Tackling Climate Change with Machine Learning

Session Chair:
- INFORMS Annual Meeting 2023, 2024

Paper Reviewer:
- INFORMS Journal on Computing
- IEEE Transactions on Control of Network Systems
- IEEE Transactions on Information Theory
- IEEE Transactions on Communications
- IEEE Transactions on Smart Grid
- IEEE Transactions on Power Systems
- IEEE Open Journal of Control Systems
- Operations Research Letters
- Systems & Control Letters
- Artificial Intelligence
- IEEE (ISIT) International Symposium on Information Theory
- IEEE (CDC) Conference on Decision and Control
- Elsevier Electric Power Systems Research
- Energy Informatics Review Newsletter
- ACM SIGMETRICS
- ACM SIGEnergy
- AAAI

Caltech Keller Colloquium Organizing Committee