

# Li Chen 陳力

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## Education

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- Georgia Institute of Technology**, Atlanta, GA, US *Aug 2019 - May 2023 (Expected)*  
— Ph.D. in Algorithms, Combinatorics and Optimization (ACO)/ Computer Science  
— Advisor: Dr. Richard Peng  
— G.P.A. 4.0/4.0  
**National Taiwan University**, Taipei, Taiwan *Sep 2014 - Jul 2018*  
— B.S. in Computer Science and Information Engineering (CSIE)  
— Overall G.P.A. 4.20/4.30, Major G.P.A. 4.29/4.30, Rank: 2/103

## Research Interest

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Algorithms and data structures. Specifically, designing fast algorithms for large problem instances.

## Publication

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- **Li Chen**, Rasmus Kyng, Maximilian Probst Gutenberg, Sushant Sachdeva. *A Simple Framework for Finding Balanced Sparse Cuts via APSP*. SOSA 2023. (arxiv:2209.08845)
  - **Li Chen**, Ellis Hoag, Kyungwoo Lee, Julian Mestre, Sergey Pupyrev. *Minimum Coverage Instrumentation*. (arxiv:2208.13907)
  - **Li Chen**, Rasmus Kyng, Yang P. Liu, Richard Peng, Maximilian Probst Gutenberg, Sushant Sachdeva. *Maximum Flow and Minimum-Cost Flow in Almost-Linear Time*. FOCS 2022. **Best Paper Award**. (arxiv:2203.00671)
  - **Li Chen**, Richard Peng, Di Wang.  *$\ell_2$ -norm Flow Diffusion in Near-Linear Time*. FOCS 2021. (arxiv:2105.14629)
  - **Li Chen**, Gramoz Goranci, Monika Henzinger, Richard Peng, Thatchaphol Saranurak. *Fast Dynamic Cuts, Distances and Effective Resistances via Vertex Sparsifiers*. FOCS 2020. (arxiv:2005.02368)

## Awards and Honors

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|---|------------------------|
| <b>2nd place</b> , ICPC North America Championship  | <i>2020</i>            |
| <b>Champion</b> , ICPC Southeast USA Regional   | <i>2019</i>            |
| <b>Fourteenth Place</b> , ACM ICPC World Finals   | <i>2018</i>            |
| <b>Champion</b> , ACM ICPC Asia Hualien Regional  | <i>2017</i>            |
| <b>Champion</b> , National Collegiate Programming Contest of Taiwan                         | <i>2014-2015, 2017</i> |
| <b>Presidential Award (awarded to students ranking top 5%)</b> , National Taiwan University | <i>2014-2015</i>       |
| <b>Bronze Medalist</b> , International Olympiad in Informatics                              | <i>2013</i>            |

## Scholarships

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|---|-------------|
| <b>Government Scholarship to Study Abroad</b> , Ministry of Education, Taiwan | <i>2020</i> |
| <b>IDEaS and TRIAD Research Scholarship</b> , Georgia Tech                    | <i>2020</i> |

## Talks

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| <i>Maximum Flow and Minimum-Cost Flow in Almost-Linear Time</i> |                  |
| - Graduate Student Seminar, National Taiwan Normal University   | <i>Sep 2022</i>  |
| - Theory Seminar, Academia Sinica                               | <i>Sep 2022</i>  |
| - Optimization Meeting, Meta                                    | <i>July 2022</i> |
| - Algorithms Seminar, Google                                    | <i>May 2022</i>  |
| - Graduate Student Seminar, National Taiwan University          | <i>Apr 2022</i>  |
| - Theory Lunch, University of Southern California               | <i>Apr 2022</i>  |
| - Theory Seminar, University of Washington                      | <i>Apr 2022</i>  |

- Theory Seminar, Stanford University	Mar 2022
$\ell_2$ -norm Flow Diffusion in Near-Linear Time	
- FOCS 2021, Virtual	Feb 2022
- ACO Student Seminar, Georgia Tech	Nov 2021

## Experience

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<b>Research Intern, Core Data Science, Meta, Menlo Park, CA</b>	May 2022 - Aug 2022
- Worked in the Economics, Algorithms, and Optimization team.	
<b>Software Engineering Intern, Google, Kirkland, WA</b>	Jul 2018 - Sep 2018
- Worked on Search Ads 360 data pipeline.	
<b>Research Assistant, National Taiwan University, Taipei, Taiwan,</b>	Jun 2017 - Jan 2019
- Studying various 1st order methods for large-scale logistic regression. Focusing on their competitive performance on CTR (Click-Through-Rate) prediction task.	
- Advisor: Prof. Chih-Jen Lin	
<b>Research Assistant, National Taiwan University, Taipei, Taiwan,</b>	Jul 2016 - Jul 2018
- Worked on various fundamental problems on <i>planar graphs</i> , such as minimum <i>st</i> cut and shortest non-crossing paths.	
- Obtained an $O(n \log \log n)$ -time algorithm for the shortest non-crossing paths problem on planar graphs. This improves over the $O(n \log n)$ -bound obtained 2 decades ago. A similar result was obtained independently in Alex Steiger's master's thesis. (link: <a href="https://www.ideals.illinois.edu/handle/2142/98345">https://www.ideals.illinois.edu/handle/2142/98345</a> ).	
- Advisor: Prof. Hsueh-I Lu	
<b>Software Engineering Intern, Mixerbox, Taipei, Taiwan</b>	Apr 2017 - Jul 2017, Sep 2017 - Feb 2018
- Worked on content generation of the landing page and artist pages of the music app Mixerbox by machine learning tools. Since the app has an enormous number of users (over 100 million downloads and 1 million daily active users), we designed efficient methods to do the job.	
<b>Quantitative Research Intern, WorldQuant, Taipei, Taiwan</b>	Aug 2017 - Sep 2017
- Developed quantitative financial models using a stock market simulation system (WebSim).	
<b>Software Engineering Intern, Google, Taipei, Taiwan</b>	Jul 2016 - Sep 2016
- Worked on Android's boot loader. Speed up an essential procedure to gather hardware information in boot loader. More details: <a href="https://source.android.com/devices/architecture/dto/optimize">https://source.android.com/devices/architecture/dto/optimize</a>	
<b>Network Management Group, National Taiwan University, Taipei, Taiwan</b>	Feb 2015 - Aug 2017
- Assisted in managing and improving the network environment of CSIE department in NTU which has hundreds of users per day.	
- Advisor: Prof. Hsin-Mu Tsai	

## Teaching Experience

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<b>Teaching Assistant, Advanced Algorithms (CS 4540), Georgia Tech</b>	Fall 2020
<b>Teaching Assistant, Automata and Complexity Theory (CS 4510), Georgia Tech</b>	Spring 2020
<b>Teaching Assistant, Algorithm Design and Analysis, National Taiwan University</b>	Fall 2018
<b>Teaching Assistant, Data Structure and Algorithm, National Taiwan University</b>	Spring 2018
- Held and designed educational activities for students to familiarize with course material.	
<b>Lecturer, IOIcamp, National Taiwan University</b>	Winter 2016, 2017
- A training camp for high school and college students on competitive programming.	
- Taught advanced data structures and efficient polynomial operations.	
<b>Lecturer, Sprout, National Taiwan University</b>	Spring 2015, 2016
- A long-term program teaching talented high school students computer science.	
- Taught basic C/C++ and Python programming.	

## Proficient Skills

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### Programming Languages

\* C/C++, Java, Python, Haskell, Javascript, L<sup>A</sup>T<sub>E</sub>X