

# Heng-Chien (Leo) Liou

COMPUTATIONAL SOCIAL SCIENCE · ALGORITHMIC FAIRNESS · NETWORK SCIENCE

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*"Philosophers have hitherto only interpreted the world in various ways; the point is to change it."-Karl Marx*

## Research Statement

My ultimate goal is to bridge between computer science, social science, and other branches of science and engineering. Currently, I adopt the perspective from network science and computational tools to pursue this goal.

Keywords: *Computational Social Science, Algorithmic Fairness, Network Science*



## Education

### National Taiwan University

*Taipei, Taiwan*

Undergrad Student, Double Major in **Electrical Engineering** and **Psychology**

*Sep. 2016-June. 2021 (exp.)*





- One of the ten Diploma Conferment Representatives in commencement of class 2020, Dept. of Electrical Engineering
- **GPA: 4.26/4.30** and **Ranking: 1/259** , cumulative to Spring 2020
- Selected Courses  (all with letter grade **A+**; <sup>†</sup> denotes graduate-level courses)
  - **Statistics**  
Probability and Statistics, Information Theory<sup>†</sup>, Convex Optimization<sup>†</sup>
  - **Computation**  
Data Structure and Programming, Design and Analysis of Algorithms<sup>†</sup>
  - **Social Data**  
Economics I-II, Game Theory<sup>†</sup>, Introductory Sociology (d), Sociological Theory (1)-(2), Social Psychology, Psychology of Personality, Abnormal Psychology, Neural and Behavioral Modeling<sup>†</sup>

### MITx

*Online*

MicroMasters Program in **Statistics and Data Science**

*Feb. 2019 -*

- Completed four graduate level courses, at a similar pace and level of rigor as on-campus courses at Massachusetts Institute of Technology; waiting to complete the capstone exam.
- Credentials: Probability , Data Analysis in Social Science , Fundamentals of Statistics , Machine Learning 

### University of British Columbia

*Vancouver, BC, Canada*

Vancouver Summer Program, Design Thinking

*July. 2017 - Aug. 2017*

- Received training on design thinking with group project and presentation experience.

## Research Experience

### Institute of Sociology, Academia Sinica

*Taipei, Taiwan*

Undergrad Research on Computational Sociology, advised by Prof. Hsuan-Wei Lee

*Jan. 2020 - PRESENT*

- Social Consensus and Cultural Variation: Modeling and Theorizing for Social Dynamics
  - Proposal admitted by MOST Research Grant for University Students
  - Abstract admitted by 2020 Conference on Computational Sociology poster track and 2020 Taiwanese Sociological Association Annual Meeting

### Collective Algorithms Lab, National Taiwan University

*Taipei, Taiwan*

Undergrad Research on Algorithmic Game Theory, advised by Prof. Ho-Lin Chen

*Sep. 2019 - PRESENT*

- Fairness for Vaccine Allocation on Networks
  - Introduced the concern of fairness into the vaccine allocation problem

### TONIC Research Group, National Taiwan University

*Taipei, Taiwan*

Undergrad Research on Network Science, advised by Prof. Hung-Yun Hsieh

*Sep. 2018 - Apr. 2020*

- Formation of Friendship Networks among Agents with Personality Traits
  - Proposal admitted by MOST Research Grant for University Students,
  - Developed computational network models to incorporate psychological concept into network science research
  - Received MOST Research Creativity Award

## Publications

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### PREPRINTS

- **Heng-Chien Liou**, and Hsuan-Wei Lee. 2020. "Social Contagion and Associative Diffusion on Multilayer Networks." *arXiv preprint arXiv:2011.07746*. [↗](#)
- **Heng-Chien Liou**, and Hung-Yun Hsieh. 2020. "Modeling Friendship Networks among Agents with Personality Traits." *arXiv preprint arXiv:2004.12901*. [↗](#)

## Professional Development and Certification

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### ONLINE COURSES

- **Statistics**  
Probability [↗](#), Data Analysis in Social Science [↗](#), Fundamentals of Statistics [↗](#)
- **Computation**  
Machine Learning [↗](#), Quantum Machine Learning [↗](#)
- **Social Data**  
Game Theory [↗](#), Moral Foundations of Politics [↗](#), Introduction to Social Research Methods [↗](#), Classical Sociological Theory [↗](#), Network Dynamics of Social Behavior [↗](#) Anthropology of Current World Issues [↗](#)

## Honors & Awards

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### AWARDS

- 2020 RESEARCH CREATIVITY AWARD [↗](#), Ministry of Science and Technology
- 2017-9 PRESIDENTIAL AWARD (TOP 5% OF CLASS) FOR 4 SEMESTERS [↗](#), National Taiwan University
- 2017 INSTRUCTOR RECOMMENDATION, Critical Writing on Chinese Classics

### RESEARCH GRANTS

- 2020 MOST RESEARCH GRANT FOR UNIVERSITY STUDENTS, Ministry of Science and Technology
- 2019 MOST RESEARCH GRANT FOR UNIVERSITY STUDENTS, Ministry of Science and Technology

### SCHOLARSHIP

- 2020 DELTA ELECTRONICS SCHOLARSHIP, Delta Electronics
- 2019 MR. CHIEN SHIH-LIANG MEMORIAL SCHOLARSHIP, National Taiwan University
- 2018 DELTA ELECTRONICS SCHOLARSHIP, Delta Electronics
- 2018 NTUHKAA SCHOLARSHIP, National Taiwan University Hong Kong Alumni Association
- 2018 IRVING T. HO MEMORIAL SCHOLARSHIP, Irving T. Ho Memorial Foundation
- 2017 FOLK COMMITTEE SCHOLARSHIP, Office of Zhongshan District, Taipei City

## Extracurricular Activity

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### Global Initiatives Symposium Organizing Committee

Officer of Academics and Curation

*Taipei, Taiwan*

*Oct. 2016 - July. 2017*

- Organized and host Pre-Symposium Speech: Revolution of Sustainable Life.
- Was responsible for one of the academic topics- Low Carbon Economy in annual symposium.

### Viking Bar

Writer for Technology and Business Section

*Taipei, Taiwan*

*Sep. 2016 - Jan. 2018*

- Analyzed several topics in modern technology development.
- Also wrote articles about personal growth, interdisciplinary learning, gender equality.

### NTU Musical Club

Club Member & Main Actor in Annual Performance

*Taipei, Taiwan*

*Sep. 2016 - Jun. 2017*

- Learned how to act and sing like a musical actor.
- Participated in annual musical performance as one of the main actors.