

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+**; † denotes graduate-level courses)
 - **Statistics**
Probability and Statistics, Information Theory†, Convex Optimization†
 - **Computation**
Data Structure and Programming, Design and Analysis of Algorithms†
 - **Social Data**
Economics I-II, Game Theory†, Introductory Sociology (d), Sociological Theory (1)-(2), Social Psychology, Psychology of Personality, Abnormal Psychology, Neural and Behavioral Modeling†

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

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

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 [↗](#)

Coursera & edX

Online

Online Courses

Feb. 2019 -

- **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 [↗](#)

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.

Honors & Awards

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

Global Initiatives Symposium Organizing Committee

Taipei, Taiwan

Officer of Academics and Curation

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

Taipei, Taiwan

Writer for Technology and Business Section

Sep. 2016 - Jan. 2018

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

NTU Musical Club

Taipei, Taiwan

Club Member & Main Actor in Annual Performance

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.