

# LITIAN LIU

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## EDUCATION

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### Massachusetts Institute of Technology

Ph.D. in Electrical Engineering and Computer Science (GPA: 5.0/5.0)  
*Thesis Advisor:* Prof Muriel Médard

*Cambridge, MA*  
Aug 2017 – May 2021

### Princeton University

M.Eng. in Electrical and Computer Engineering (GPA: 3.8/4.0)  
*Thesis Advisor:* Prof Mung Chiang

*Princeton, NJ*  
Aug 2016 – Aug 2017

### The Chinese University of Hong Kong

B.Eng in Information Engineering (GPA: 3.75/4.0)  
*Bachelor of Engineering with Honours, First Class*  
*Thesis Advisor:* Prof Xiaou Tang

*Hong Kong*  
Aug 2012 – May 2016

## PROFESSIONAL EXPERIENCE

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### Qualcomm Inc. – Modem Engineer; Machine Learning Researcher

*San Diego, CA*  
July 2021 – Now

*Project:* Large language model-based algorithm for facilitating the chip design flow.

- Designing and evaluating of the algorithm.

*Project:* Machine learning algorithm for beam prediction in millimeter wave communications.

- Contributing to the system design of the algorithm.
- Supporting their implementation on chip.

*Project:* Online adaptation of machine learning models in 5G modem

- Aiming to adapt ML model to current local data so as to achieve algorithm robustness and personalization gain.
- Working on the design of ML-enabling modem chip.
- Proposed and evaluated a mechanism for triggering online model adaptation.

### Broad Institute – Associated Researcher in Machine Learning Group

*Cambridge, MA*

*Project:* Encoding and Decoding Optimization of RNA localization protocol

September 2019 – May 2021

- Built up experimental data backed emulation platform to evaluate RNA localization protocol
- Designed and built heuristic algorithms to localize RNA molecules from sequential profiling images
- Developed and implemented the Bayesian-based decoding algorithm as well as learning-based codes.
- Overall, improved the state-of-art error rate for rare RNA types by ~40%

## PUBLICATIONS

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### BOOK CHAPTER

L. Liu, A. Solomon, S. Salamatian, D. Malak, M. Médard, “Neural Network Coding” in “Machine Learning and Wireless Communications” in preparation, Cambridge University Press, 2022.

### CONFERENCE PAPERS

L, Liu, & Y. Qin “Fast Decision Boundary based Out-of-Distribution Detector. ICML 2023.

L. D’Alessio\*, L. Liu\*, K. Duffy, Y. Eldar, M. Médard, M. Babadi, “A Coding Theory Perspective on Multiplexed Molecular Profiling of Biological Tissues”, 2020 International Symposium on Information Theory and Its Applications (ISITA), Virtual, Oct. 2020. (\* These two authors contribute equally to the work.)

**L. Liu**, A. Salomon, S. Salamatian, M. Médard, “Neural Network Coding”, 2020 IEEE International Conference on Communications (ICC), Virtual Conference, June 2020.

**L. Liu**, D. Malak, and M. Medard, “Guesswork for Inference in Machine Translation with Seq2seq Model”, 2019 IEEE Information Theory Workshop (ITW), Gotland, Swenden, Aug. 2019.

S. Salamatian, **L. Liu**, A. Beirami, and M. Medard, “Mismatched Guesswork and One-to-One Codes”, 2019 IEEE Information Theory Workshop (ITW), Gotland, Swenden, Aug. 2019.

## JOURNAL PAPER

C. Ayubchaa, S. Singhc, K. Pateld, A. Rahmime, J. Hasanc, **L. Liu**, T. Werner, A. Alavic, “Machine learning in the positron emission tomography imaging of Alzheimer’s disease”, accepted to Nuclear Medicine Communication (preprint).

## TEACHING

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**MIT** –Teaching Assistant for 6.262 Discrete Stochastic Processes, Spring 2021

*Cambridge, MA*

- Revised and graded Homeworks, Midterms, and Final Exams.
- Held office hour and assisted with questions.
- Lectured recitation sessions.

**MIT** –Teaching Assistant for 6.441 Information Theory, Spring 2020

*Cambridge, MA*

- Revised and graded Homework, Midterms, and Final Exams.
- Held office hour and assisted with questions.

## PRESENTATION

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"A Coding Theory Perspective on Multiplexed Molecular Profiling of Biological Tissues", 2020 International Symposium on Information Theory and Its Applications (ISITA), Virtual, Oct. 2020.

## PROFESSIONAL SERVICE

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### Conference Reviewer:

IEEE International Symposium on Information Theory (ISIT); IEEE Information Theory Workshop; IEEE The Vehicular Technology Conference.

### Journal Reviewer:

Neural Computation; Neural network; IEEE Journal on Selected Areas in Information Theory.

### TPC Member:

IEEE The Vehicular Technology Conference.

## HONORS and AWARDS

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Qualcomm Impact Award	2024
D. E. Shaw Exploration Fellowship	2019
Irwin Mark Jacobs and Joan Klein Jacobs Presidential Fellowship, MIT.	2017
Princeton University Graduate School Dean's Grant, Princeton	2016
First Year Fellowship, Princeton University	2016
The Charles Kao Top Performance Awards 2015-16 (Graduate with highest GPA), CUHK	2016
AMC Pacific Technology Scholarship	2015
The Hong Kong Special Administrative Region Government Scholarship Reaching Out Award	2015
Prof Charles K. Kao Research Exchange Scholarship	2014
Golden Jubilee Scholarship	2014
Kai Chong Tong Scholarship	2014
Department/Program Scholarship, Shaw College, CUHK	2014, 2015
College Head's List, Shaw College, CUHK	2014, 2015
Dean's List	2014, 2015