Long Le

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Education

University of Massachusetts Amherst — **Amherst, MA**
Dual Bachelor of Science, Computer Science and Statistics. GPA: 3.958 / 4.0 — *Sep. 2018 – Dec. 2021*

- **Graduate Coursework**: 14 graduate-level classes. Selected courses:
  - **Computer Science**: Randomized Algorithms (CS 690RA), Neural Dynamics (CS 591NR), Stochastic Simulation (CS 590M).
  - **Math**: Convex Optimization (CS 590OP), Numerical Methods (Math 651).
  - **Statistics**: Stochastic Calculus (Math 797P), Stochastic Process (Math 697U), Measure-theoretic Probability (Stat 605).
- **Academic Honors**:
  - Chancellor's Scholarship: highest merit-based award for out-of-state students at UMass.
  - Sheila Flynn Research Scholarship: Summer 2019 research funding from UMass Mathematics Department.

Technical Skills

Research Areas	AI, Multi-agent Systems, Machine Learning, Sequential Decision Making.
Programming Languages	Python, C++/C, SQL, Java, JavaScript/HTML/CSS, MATLAB, R.

Publications & Preprints

[1] Huao Li, **Long Le**, Max Chis, Keyang Zheng, Dana Hughes, Michael Lewis, and Katia Sycara. Sequential Theory of Mind Modeling in Team Search and Rescue Tasks. *AAAI Fall Symposium on Computational Theory of Mind for Human-Machine Teams*, 2021. [link].

[2] **Long Le** and Yao Li. Supervised Neuronal Parameter Estimation from Spiking Trains. *Preparing for submission to Frontiers in Computational Neuroscience*, 2021. [link].

[3] **Long Le**, Dana Hughes, and Katia Sycara. Multi-agent Hierarchical Reinforcement Learning in Urban Search and Rescue. *Robotics Institute Summer Scholar's Journal*, 2021. [link].

[4] **Long Le**, Vignesh Viswanathan, and Yair Zick. Dynamics and Fairness of Coalition Formation under Uncertainty. *Working paper*, 2021.

Industry Experience

Google — **Mountain View, CA**
Software Engineer — *Feb. 2022 – Sep. 2022*

- Will be working on Machine Learning (ML) for Ads.

Facebook — **Menlo Park, CA**
Software Engineer Intern — *Jun. 2020 – Sep. 2020*

- Worked with the Ads Supply Optimization Team of Instagram to build new ML models for contextual ad load, prescribing the number of ads shown to users based on contextual signals.
- With novel ad hypotheses, our models significantly outperformed the existing ones in terms of revenue-user-sentiment trade-off (around 3x improvement) and other metrics.

Research Experience

Carnegie Mellon University - Robotics Institute — **Pittsburgh, PA**
Research Intern — *May 2021 – Present*

- Working with Prof. **Katia Sycara**, Prof. **Michael Lewis**, and Dr. **Dana Hughes** on Artificial Social Intelligence.
- **Theory of Mind** (ToM): predict others' beliefs, desires, and intentions.
  - Helped develop dynamic machine Theory of Mind inference with human baseline. Paper [1].
  - Built a team coordination LSTM predictor from communication signals. Built a ToM and intervention model to intelligently share knowledge between teammates.
- **Multi-agent control**: maximize a team's performance in an environment.
  - Trained AI teams for search-and-rescue missions using Multi-agent Hierarchical Reinforcement Learning on a small environment. [video], paper [3].
  - Building AI teams with optimal task allocation and scheduling.
- Part of the Robotics Institute Summer Scholar Program (RISS).

University of Massachusetts Amherst **Amherst, MA**
Research Assistant *Sep. 2018 - Present*

- **Game Theory**: with Prof. **Yair Zick** on the dynamics and fairness of coalition formation games under uncertainty. (Fall 2020 - present).
- **Computational Neuroscience**: with Prof. **Yao Li** on applying deep learning for parameter estimation in neuronal models. Paper [2]. Funded REU research during Summer 2019 (Spring 2019 - Fall 2020).
- **ML Psychometrics**: with Prof. **John Lalor** (then PhD student) on modeling ML learners using Item Response Theory (Fall 2018).

Teaching Experience

University of Massachusetts Amherst **Amherst, MA**
Teaching Assistant *Jan. 2019 - Present*

- **Computer Science**:
  - CS 490A: Natural Language Processing (Fall 2021)
  - CS 370: Computer Vision (Spring 2021).
  - CS 383: Artificial Intelligence (Spring 2020).
  - CS 240: Introductory Probability (Spring 2019, Fall 2019, Fall 2020).
- **Math**:
  - Math 551: Numerical Methods (Spring 2020, Spring 2021).
  - Math 128: Calculus (Spring 2019, Fall 2019).
- Outstanding TA Award for CS370 and CS240. Chosen by instructors for timely, detailed grading, (hyper)-active in discussion board, office hour, and other contributions.

Class Projects

WatchAll: a cross-platform discovery app **Collaborators: Liam Brandwein**
Web development *CS 326 (Fall 2021)*

- Developing a web application to allow users to discover streams from different platforms (Twitch, Youtube, Facebook Gaming).

Genderness in Anonymized Resumes **Collaborators: Hannah Lerner, Aparimit Chandra**
Natural Language Processing *CS 689 (Spring 2021)*

- Explored gender bias of human annotators and gender recognizability of NLP models in anonymized resumes. [report].

Infectious Disease Networks **Collaborator: None**
Graph, Networks *CS 591NR (Spring 2020)*

- Implemented SIR model and Gillespie sampling for epidemic modeling in a small location population. Implemented degree-based mean-field network to model epidemic propagation in large and connected populations. [original paper], [notebook].

Lung Cancer Model **Collaborators: Vishal Sarsani**
Bayesian Statistics *Statistics 610 (Fall 2019)*

- Reproduced a Bayesian Mixture Model for lung cancer prediction. The Bayesian model fitted some spatial interaction parameters between different cell types from medical imaging data. These parameters can then be used as predictors in a Cox regression for cancer progression. [original paper],[report].

Movie Recommender **Collaborator: Steven Qiu**
Recommender System *CS 590OP (Fall 2019)*

- Used the Alternating Least Square (ALS) algorithm for collaborative filtering on the MovieLens dataset. Utilized locality hashing to efficiently compute a user's inclination towards a massive pool of products. [report].

Image Denoising **Collaborator: None**
Computer vision, Monte Carlo Markov Chain (MCMC) *Math 697AM (Spring 2019)*

- Used Ising model and Gibbs sampler to reconstruct images polluted by Gaussian noise. [report]

Talks & Presentations

Multi-agent Hierarchical Reinforcement Learning in Urban Search and Rescue **Virtual**
REU Poster Session (14 schools) *Aug. 2021*

Instagram Explore's Contextual Ad Load **Virtual**
Facebook Teamwide Presentation *Aug. 2020*

Deep Learning for Neuronal Estimation **Amherst, MA**
REU New England Conference (7 schools) *July 2019*