

# Richard Liu

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## Education

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### University of Chicago

B.A. Economics, B.S. Mathematics

- o GPA: 3.73
- o Honors: University Scholar Award, Dean's List

## Research Experience

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**Interests:** Geometry processing, discrete differential geometry, 3D machine learning, computer graphics

### University of Chicago 3DL Graphics Lab – Rana Hanocka

July 2021 – Present

Research Professional

- o Text2Mesh: Semantic style manipulation of meshes by learning neural style field guided by a text-based style description with input mesh as a geometric prior
  - o “Text2Mesh: Text-Driven Neural Stylization for Meshes”: submitted to CVPR 2022
  - o [Paper](#), [Website](#)
- o Parameterization-Aware Segmentation: Unsupervised framework for generating local segmentation of a mesh conditioning on a user input with dual objectives of semantics and parameterization distortion

### Yale Tobin Center for Economic Policy – John Eric Humphries and Yusuke Narita

July 2020 – September 2021

Predoctoral Fellow

- o Project Descriptions:
  - o Algorithm is Experiment: Causal effect identification using algorithmic (ML) decisions as natural experiments
  - o Experiment-as-Market: Welfare-maximizing experimental design
  - o New Haven Public Schools: medium to long-term effects of free pre-k on child and parent outcomes
  - o OPE for RL: Efficient off-policy evaluation for bandit and reinforcement learning settings
- o Implemented Algo-is-Experiment and Experiment-as-Market methods as Python and R libraries

### Booth School of Business – Anita Rao

March 2020 – July 2020

Research Professional

- o Project: Effect of industry funding on reported research findings in food science
- o Trained and tested state-of-the-art NLP models to perform polarity analysis on the food science literature
- o Regression analysis of the effect of market share concentration on publication polarity in specific food industries

### Booth School of Business – John Barrios

March 2017 – August 2018

Research Assistant

- o Project Descriptions:
  - o Pollution regulatory capture: Industry capture of EPA state bodies and laxity in pollution monitoring
  - o Externalities of rideshare: Measuring the public costs of rideshare in terms of pollution and traffic fatalities

## Papers/Presentations

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### Text2Mesh: Text-Driven Neural Stylization for Meshes

November 2021

Submitted to CVPR 2022

- o Text-driven neural stylization method over 3D meshes supervised by CLIP

### Introduction to Mesh Parameterization

September 2021

UChicago 3DL Talk Series

- o Presented notes on mesh parameterization theory and methods to the UChicago 3DL Computer Graphics lab

### Designing Online Advertisements via Bandit and Reinforcement Learning

July 2021

(Peer-Reviewed) ICML 2021 RL4RealLife Workshop

- o Proposes a new estimator for off-policy evaluation for Markov Decision Processes (MDP) and reinforcement learning, with desirable convergence and consistency properties.

### The Unilateral Price Effects of Several National SFR Mergers

January 2021

Yale Graduate Course ECON556

- o Applies a 2-way fixed effects analysis framework to estimate the price effects of the largest mergers of single-family rental (SFR) companies in the US

## Awards and Honors

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### ITA Tech Challenge – Top 150

September 2018

### The Econometrics Game – 2<sup>nd</sup> place

April 2018

- o 12-hour competition to apply econometric analyses to a dataset and produce an academic paper
- o Analyzed fracking company decisions on the extensive and intensive margin in relation to socioeconomic factors
- o Presented results to a panel of 3 Nobel laureates and crowd of industry sponsors

## Other Projects

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### Distributed Ray Tracer

April 2021

- Wrote a distributed ray-tracer as part of the final project for CPSC578 Introduction to Computer Graphics at Yale
- Implemented distributed effects using Monte-Carlo integration and adapted Perlin noise towards cloud textures
- 3<sup>rd</sup> place in class “render-off” animation contest

### ShelterTech Volunteer

August 2019 – August 2020

- SF-based non-profit dedicated to bringing free wifi to shelters and making city services more accessible
- Assisted in developing mobile version of the SF Service Guide (directory and online assistant for navigating public services/shelters) for Android
- Coordinated outreach to community partners to maintain consistent flow of data quality checks

### PotusSentiBot

January 2020 – August 2020

- A natural-language (NLP) Twitter bot that estimates and tweets daily user sentiment of the two US presidential candidates during the 2020 election season
- Model is an adaptation of BERT towards Aspect-Based Sentiment Analysis (ABSA) as described in Sun et al. 2019

### TFT Reroll Calculator

March 2020 – May 2020

- Modeled the game states in the game Teamfight Tactics as a Markov chain to develop a general-purpose probability calculator for user-specified conditions
- Published as an open-source RShiny application

## Skills

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**Technical (Languages):** Python, C/C++, R, Stata, SQL, Linux, LaTeX

**Technical (Analysis):** PyTorch, Tensorflow, sklearn, data.table, webscraping, GIS