

# XINYUE CUI

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## EDUCATION

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- University of Southern California** *Aug 2022 - May 2024*  
*Master of Science in Computer Science* *GPA: 3.92/4.0*  
- **Relevant Coursework:** Analysis of Algorithms, Machine Learning, Deep Learning, Applied Natural Language Processing, Advanced Natural Language Processing
- University of California, Los Angeles** *Sept 2018 - June 2022*  
*Bachelor of Science in Mathematics of Computation, Minor in Linguistics* *GPA: 3.84/4.0*  
- **Relevant Coursework:**
- **Computer Science:** Machine Learning, Artificial Intelligence, Algorithms & Complexity
  - **Mathematics:** Calculus, Probability, Statistics, Optimization, Linear Algebra, Numerical Methods
  - **Linguistics:** Computational Linguistics, Syntax, Translation & Interpreting

## RESEARCH INTERESTS

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My research interests lie broadly at **machine learning**, **deep learning**, and **natural language processing**, with a focus on advancing algorithms and models that can effectively process and comprehend human reasoning and language.

## PUBLICATIONS

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- **Xinyue Cui** and Swabha Swayamdipta. “Linguistic Structure Distillation: A Case for FrameNet.” *Under preparation*.
- **Xinyue Cui**, Praveen Bandla and Rishi Sonthalia. “Effect of Geometry on Graph Neural Networks.” *Under preparation*.
- **Xinyue Cui** and Rishi Sonthalia. “Hyperbolic and Mixed Geometry Graph Neural Network.” In *NeurIPS Workshop on Symmetry and Geometry in Neural Representations*. 2022.
- Myers et al. “ICLR 2022 Challenge for Computational Geometry & Topology: Design and Results.” In *ICLR Workshop on Geometric and Topological Representation Learning*. 2022.

## RESEARCH EXPERIENCE

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- Frame-Semantic Structured Data Augmentation** *May 2023 - Present*  
*Research Assistant*, with Swabha Swayamdipta *University of Southern California*  
- Applied large language models to augment FrameNet dataset for frame-semantic role labeling  
- Adapted **T5** models to generate diverse annotations, outperforming larger-sized zero-shot models in BARTScore  
- Constructed a **SpanBERT**-based classifier to predict the frame element type of generated spans with **97%** accuracy
- Hyperbolic Graph Neural Networks** *Sept 2021 - Present*  
*Research Assistant*, with Rishi Sonthalia *University of California, Los Angeles*  
- Generalized current machine learning models to hyperbolic manifolds to efficiently utilize the geometry of data space  
- Built mixed geometry Graph Neural Networks with both hyperbolic and Euclidean layers to be trained jointly  
- Evaluated mixed geometry models on node classification tasks, outperforming Euclidean counterparts
- Child Language Acquisition via Bayesian Inference** *June 2021 - June 2022*  
*Research Assistant*, with Laurel Perkins *University of California, Los Angeles*  
- Implemented Bayesian machine learning models on child language acquisition and argument structure learning  
- Applied MCMC algorithms to sample model parameters to jointly infer verb transitivity and noise observed in data  
- Tested on child-directed speech and reached an **80%** accuracy in learning verb transitivity

## HONORS

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**Kaggle Competition in Time Series Forecasting** – *Top 5% on global leaderboard*

*Dec 2022*

**Latin Honors** – *Cum Laude at UCLA*

*June 2022*

**ICLR 2022 Challenge for Computational Geometry & Topology** – *1st place, \$2,000 prize*

*March 2022*

## **WORK EXPERIENCE**

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**Jointelligent Technology Co., LTD, Tianjin, China**

*June 2021 - Aug 2021*

*Software Engineer Intern*

- Developed and tested applications of a Manufacturing Execution System using Postman API
- Analyzed large-scale industrial production data and implemented machine learning models for predictive maintenance

## **TECHNICAL SKILLS**

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**Programming Languages:** C++, Python, Bash, Haskell, Lisp, MATLAB

**Frameworks & Tools:** PyTorch, Pandas, Numpy, Scikit-Learn, LaTeX, Git