

Jacob Choi

MSCS Student at USC, Los Angeles, CA, 90007, USA
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EDUCATION

University of Southern California , Los Angeles, US	August 2024 — May 2026
Master of Science in Computer Science	

Emory University , Atlanta, US	August 2020 — May 2024
Bachelor of Science in Computer Science with <i>Highest Honors</i> Thesis Title: Large Language Models with Religious Text	

PUBLICATIONS

Workshop Papers

- **ContextLeak: Auditing Leakage in Private In-Context Learning Methods.**
The Impact of Memorization on Trustworthy Foundation Models (MemFM) Workshop @ ICML 2025.
Jacob Choi, Shuying Cao, Xingjian Dong, Sai Praneeth Karimireddy
Additionally under review at *ACL Rolling Review (ARR)*.
- **Auditing Privacy-Preserving In-Context Learning Methods.**
L2M2: The First Workshop on Large Language Model Memorization @ ACL 2025.
Jacob Choi*, Shuying Cao*, Xingjian Dong*, Sai Praneeth Karimireddy

Journal Papers

- **What is Your Favorite Gender, MLM? Gender Bias Evaluation in Multilingual Masked Language Models.**
Jeongrok Yu, Seong Ug Kim, **Jacob Choi**, Jinho D. Choi. *Information*, 2024

Theses

- **When Large Language Models Meet Religious Text.**
Undergraduate Honors Thesis, Emory University, Spring 2024. Available via Emory's Open Access Thesis Repository.
Committee Members: Jinho Choi, **Davide Fossati**, **Hiram Maxim**, **Helen Jin Kim**

RESEARCH EXPERIENCE

Foundations of Responsible and Trustworthy Machine Learning (FORT-ML)
Graduate Student Researcher. Advised by **Sai Praneeth Karimireddy**.

Los Angeles, USA
December 2024 — Present

- Designed *ContextLeak*, the **first auditing framework** for private in-context learning methods and showcased that empirical privacy leakage correlates *tightly* with formal privacy budgets across multiple defenses
- Demonstrated that analyzing the average-case privacy leakage often observed in literature alone is **not enough**, highlighting how prompt-based defenses are *insufficient* when we estimate **worst-case privacy leakage** with our attacks
- Showcased the need for better utility methods by observing that the privacy-utility tradeoff across existing defenses exhibit a **sharp increase in utility**, followed by *diminishing returns* as we increase the privacy budget

Emory NLP

Undergraduate Student Researcher. Advised by **Jinho Choi**.

Atlanta, USA
August 2022 — August 2024

Project: Large Language Models with Religious Text

- Fine-tuned Llama-2 model using Low-Rank Adaptation (LoRA) to answer user queries with relevant Bible verses and to explore open-ended problems in the intersection between LLMs and religion
- Built web scrapers to structure datasets from Bible versions and commentaries to improve dialogue performance about the Bible across multiple tasks and achieve competitive performance against commercial state-of-the-art LLMs
- Created multiple datasets to assess chatbot dialogue proficiency in a Biblical context, including cross-referencing and semantic similarity, named entity recognition of Biblical artifacts, and theological question and answering

Project: Gender Bias Across Languages in Masked Language Models

- Created a gendered lexicon to evaluate sentences containing gendered pronouns across different languages to evaluate gender bias without the need for parallel corpora.
- We observe that BERT-based encoders favor the male pronoun across languages for a specific corpora, contrary to an existing work that showcases female preference, possibly due to confounding biases.

Language Information and Computation (LINC)
Visiting Researcher. Advised by Jugal Kalita.

Colorado Springs, USA
 June 2022 — August 2022

- Designed semantic attacks using LLM-based paraphrasing with rhetorical structure theory for generating stylized triggers
- Trained LMs on designed attacks to reveal resistance against defenses compared to existing methods
- Presented research findings for a broader understanding of vulnerabilities in LMs with adversarial attacks

Emory Graph Mining Group

Lab Auditor. Worked with Jiaying Lu and Carl Yang.

Atlanta, USA
 January 2021 — May 2022

- Automated structured knowledge (taxonomies and knowledge graphs) in the healthcare domain with LLMs
- Validated structured knowledge (concept maps) derived from graph generative models (acknowledgement in [paper](#))
- Participated in weekly reading group discussions, found graph-mining papers for group readings

PRESENTATIONS, POSTERS, AND SEMINARS

SouthNLP Symposium 2024

April 2024

Gave a [poster](#) presentation on undergraduate thesis work, *Large Language Models With Religious Text*, among students doing research in NLP across 10+ schools in the south, including UNC Chapel Hill, UT Austin, Georgia Tech, UVA, and more

Undergraduate Thesis Defense

March 2024

Successfully defended undergraduate thesis with four committee members to obtain **highest honors**

Seminar at Emory NLP

November 2023

Presented at a Emory NLP seminar titled *Religious Text Training in Large Language Models*

University of Colorado Colorado Springs (UCCS) REU Symposium 2023

August 2023

30 minute oral presentation on research, *Latent Separability and Backdoor Attacks of Language Models*, for work done at UCCS

CS 371 AI Research Practicum Symposium

December 2022

Oral and [poster](#) presentation for research project, *What is Your Favorite Gender, MLM?: Evaluating Gender Bias in Multilingual Masked Language Models*, to conclude semester-long course designed to teach students how to conduct research from scratch, which developed into a [publication](#)

AWARDS

Deans Honors List

Fall 2022, 2023

Davinci Talks Finalist

February 2024

One of three finalists selected to present interdisciplinary research to faculty and students

UCCS REU Program

June — August 2023

Selected as one of 12 participants to undergo research at UCCS for the REU in Deep Learning in Natural Language Processing, Bioinformatics and Computational Medicine

Dooley Hacks "Hello, World" Hackathon Second Place

November 2020

Developed self-updating Spotify playlist with YouTube trending music using Spotify API

Congress Bundestag Youth Exchange Scholar

July 2019 — March 2020

Year-long, fully-funded study abroad for German language immersion in Aachen, Germany funded by US Department of State

WORK EXPERIENCE

ZyBooks

Editor

Remote

September 2024 — Present

- Edit online computer science textbooks to facilitate learning with an emphasis in Data Structures and Algorithms, Machine Learning, Probability and Statistics, and Data Science

Cox Computing Center @ Emory University

Atlanta, USA

Technology Consultant

August 2023 — May 2024

- Provided technological assistance to students, faculty, and staff by troubleshooting hardware and software problems, setting up devices, and offering guidance on academic projects
- Oversaw usage and maintenance of computing resources, such as computers, printers, and other peripherals

SKILLS

Languages: Python, Java, C, Bash

Frameworks and Libraries: PyTorch, DSPy, Opacus, SLURM, Hugging Face, TogetherAI

LEADERSHIP AND COMMUNITY ENGAGEMENT

South NLP Symposium

Volunteer

Atlanta, USA

April 2024

- Helped manually optimize poster presentation layout to increase engagement between presenters and audience
- Organized welcoming booth to facilitate streamlined entry and registration for a timely start

Undergraduate Student Conduct Peer Review Board

Member/Panelist

Atlanta, USA

August 2023 — May 2024

- Participated in hearing process of alleged violations of Undergraduate Code of Conduct by assessing incident reports, understanding perspectives of involved parties, and contributing to decisions regarding responsibilities and sanctions
- Assist in recommending appropriate educational sanctions for students found responsible for violations to promote understanding, accountability, and overall community welfare

Emory In Via: Emory's Journal of Christian Thought (Under the Augustine Collective)

Treasurer

Atlanta, USA

August 2022 — May 2024

- Facilitate interactive faculty-student meetings, fostering dialogue on the intersection of faith with academia
- Efficiently manage \$2,000+ annual budget, strategically allocating funds to support publication of student journals
- Led fundraising initiatives and authored successful grant proposals to secure funding from interdisciplinary offices

Journey Church of Atlanta

Small Group Leader

Atlanta, USA

August 2022 — May 2024

- Facilitate weekly discussions exploring scripture as it applies to daily life and manifestation of faith
- Coordinate and direct engaging musical worship sessions to foster spiritual engagement among college students
- Engage in local outreach initiatives, providing tutoring and mentorship for children's educational development

ADDITIONAL SKILLS AND INTERESTS

Languages: Native English Speaker, Proficient Mandarin Speaking, CEFR-Level B1 German (intermediate)

Fine Arts and Hobbies: Abacus/Flash Mental Math and Dictation, Chinese Landscape Painting, Violin, Guitar, Piano

REFERENCES

Sai Praneeth Karimireddy

Assistant Professor, Thomas Lord Department of Computer Science, University of Southern California, Los Angeles, USA

E-mail: karimire@usc.edu

Scholar Profiles: Personal Page — Google Scholar

Jinho Choi

Associate Professor, Computer Science, Quantitative Theory and Methods, and Linguistics, Emory University, Atlanta, USA

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Scholar Profiles: Personal Page — Google Scholar — LinkedIn

Jugal Kalita

Professor and Chair of Computer Science, University of Colorado Colorado Springs, Colorado Springs, USA

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