Jacob Choi

MSCS Candidate at USC, Los Angeles, CA, 90007, USA
Google Scholar — Personal Website — jacobjch@usc.edu — LinkedIn

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 *Highest Honors*
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
  Preprint. Planned submission to ICML 2026. Workshop Poster.
- **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) — Los Angeles, USA
*Graduate Student Researcher. Advised by **Sai Praneeth Karimireddy**.* — December 2024 — Present

- Implemented *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 — Atlanta, USA
*Undergraduate Student Researcher. Advised by **Jinho Choi**.* — 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 Evaluation for Multilingual 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) — Colorado Springs, USA
*Visiting Researcher. Advised by **Jugal Kalita**.* — 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 Atlanta, USA
*Lab Auditor. Worked with **Jiaying Lu** and **Carl Yang**.* 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 Remote
Editor 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

Worldwide Friends Student Organization at USC — Los Angeles, USA
President — August 2025 — Present

- Facilitate environment for 20+ weekly members that invites international students to eat dinner, converse, and share about their background and upbringing with the goal of making lasting friendships
- Manage logistics for preparing food, discussions, outdoor activities, and games through weekly meetings and planning

South NLP Symposium — Atlanta, USA
Volunteer — 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

Emory's Undergraduate Student Conduct Peer Review Board — Atlanta, USA
Member/Panelist — 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) — Atlanta, USA
Treasurer — 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 — Atlanta, USA
Small Group Leader — 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
E-mail: jinho.choi@emory.edu
Scholar Profiles: Personal Page — Google Scholar — LinkedIn

Jugal Kalita
Professor and Chair of Computer Science, University of Colorado Colorado Springs, Colorado Springs, USA
E-mail: jkalita@uccs.edu
Scholar Profiles: Personal Page — Google Scholar — LinkedIn