

JUSTIN LOVELACE

jl3353@cornell.edu

<https://justinlovelace.github.io/>

<https://scholar.google.com/citations?user=k2CBs3gAAAAJ>

EDUCATION

Cornell University

August 2022 - Present

- PhD in Computer Science
- Advisor: Prof. Kilian Q Weinberger
- Google PhD Fellow in Machine Learning & ML Foundations

Carnegie Mellon University

August 2020 - August 2022

- M.S. in Language Technologies, School of Computer Science
- Advisor: Prof. Carolyn Rosé

GPA: 4.10

Texas A&M University

August 2016 - May 2020

- B.S. in Computer Science, Minor in Mathematics
- Advisor: Prof. Bobak Mortazavi
- Honors Fellow, Undergraduate Research Scholar
- USA Powerlifting: All-American, 2019 Collegiate National Runner-Up

GPA: 4.0

HONORS AND AWARDS

Google PhD Fellowship—Machine Learning & ML Foundations

2025-2027

NSF National Artificial Intelligence Research Resource (NAIRR) Pilot Award

2024

Principal Investigator

- Project: “Enhancing Large Language Model Alignment through Diffusion Generated Soft-Prompts”
- Award: 10,000 GPU Hours on TACC Vista Supercomputer

Keri Family PhD Fellowship

2022-2023

Cornell University

Carnegie Mellon University Research Fellowship

2020-2022

CRA’s Outstanding Undergraduate Researcher Award (Honorable Mention)

2020

PUBLICATIONS

1. “SpeechOp: Inference-Time Task Composition for Generative Speech Processing”
Justin Lovelace, Rithesh Kumar, Jiaqi Su, Ke Chen, Kilian Q Weinberger, Zeyu Jin
ICLR, 2026
2. “Adaptive Moments are Surprisingly Effective for Plug-and-Play Diffusion Sampling”
Christian Belardi, **Justin Lovelace**, Kilian Q Weinberger, Carla P Gomes
ICLR, 2026
3. “Pre-training Limited Memory Language Models with Internal and External Knowledge”
Linxi Zhao, Sofian Zalouk, Christian Belardi, **Justin Lovelace**, Jin Peng Zhou, Kilian Q Weinberger, Yoav Artzi, Jennifer Sun
ICLR, 2026
NeurIPS 2025 CCFM Workshop, Best Paper Runner Up

4. “Stop-Think-AutoRegress: Language Modeling with Latent Diffusion Planning”
Justin Lovelace, Christian Belardi, Sofian Zalouk, Adhitya Polavaram, Srivatsa Kundurthy, Kilian Q Weinberger
COLM, 2025
5. “Improving Multislice Electron Ptychography with a Generative Prior”
Christian Belardi, Chia-Hao Lee, Yingheng Wang, **Justin Lovelace**, Kilian Q Weinberger, David Muller, Carla Gomes
Computer Vision for Materials Science Workshop (CV4MS) at ICCV, 2025
6. “Sample-Efficient Diffusion for Text-To-Speech Synthesis”
Justin Lovelace, Soham Ray, Kwangyoun Kim, Kilian Q Weinberger, Felix Wu
Interspeech, 2024
7. “Diffusion Guided Language Modeling”
Justin Lovelace, Varsha Kishore, Yiwei Chen, Kilian Q Weinberger
Findings of the Annual Meeting of the Association for Computational Linguistics (Findings of ACL), 2024
8. “Latent Diffusion for Language Generation”
Justin Lovelace, Varsha Kishore, Chao Wan, Eliot Shekhtman, Kilian Q Weinberger
Conference on Neural Information Processing Systems (NeurIPS), 2023
9. “IncDSI: Incrementally Updatable Document Retrieval”
Varsha Kishore, Chao Wan, **Justin Lovelace**, Yoav Artzi, Kilian Q Weinberger
International Conference on Machine Learning (ICML), 2023
10. “A Framework For Adapting Pre-Trained Language Models to Knowledge Graph Completion”
Justin Lovelace and Carolyn Rosé
Conference on Empirical Methods in Natural Language Processing (EMNLP), 2022
11. “Robust Knowledge Graph Completion with Stacked Convolutions and a Student Re-Ranking Network”
Justin Lovelace, Denis Newman-Griffis, Shikhar Vashishth, Jill Fain Lehman, and Carolyn Rosé
Annual Meeting of the Association for Computational Linguistics and the International Joint Conference on Natural Language Processing (ACL-IJCNLP), 2021
12. “Learning to Generate Clinically Coherent Chest X-Ray Reports”
Justin Lovelace, Bobak Mortazavi
Findings of the Conference on Empirical Methods in Natural Language Processing (Findings of EMNLP), 2020
13. “Dynamically Extracting Outcome-Specific Problem Lists from Clinical Notes with Guided Multi-Headed Attention”
Justin Lovelace, Nathan C. Hurley, Adrian Haimovich, Bobak Mortazavi
Machine Learning for Healthcare Conference (MLHC), 2020

ACADEMIC EXPERIENCE

ML Core Lab at Cornell University

Graduate Research Assistant

August 2022 - Present

Advisor: Dr. Kilian Q. Weinberger

- Developing latent diffusion language models.

Teledia Lab at Carnegie Mellon University

Graduate Research Assistant

August 2020 - August 2022

Advisor: Dr. Carolyn Rosé

- Adapted pre-trained language models to improve the coverage of knowledge graphs.

STMI Lab at Texas A&M University

Undergraduate Researcher

April 2018 - May 2020

Advisor: Dr. Bobak Mortazavi

- Developed convolutional attention models to extract information from clinical notes and predict adverse outcomes for ICU patients.
- Developed an abstractive radiology report generation framework that improved the clinical correctness of generated reports.

INDUSTRY EXPERIENCE

Meta FAIR

Research Scientist Intern - Audiobox Team

May 2025 - August 2025

New York City, NY

- Developed autoregressive diffusion models for speech generation.
- Demonstrated that they improve upon non-autoregressive approaches in terms of naturalness and latency.

Adobe Research

Research Scientist Intern- Speech AI Group

May 2024 - August 2024

San Francisco, CA

- Developed SpeechOp, a multi-task latent diffusion model transforming pre-trained TTS into a universal speech processor (TTS, enhancement, separation).
- Introduced novel inference-time Implicit Task Composition (ITC), achieving state-of-the-art content preservation in speech enhancement using Whisper guidance.

ASAPP

Research Intern

May 2023 - August 2023

New York City, NY

- Developed the first diffusion model for text-to-speech synthesis that does not require explicit phoneme alignment for generation.
- Outperformed the state-of-the-art autoregressive TTS system using less than 2% the training data.

PATENTS

“Text-to-Audio Conversion with Byte-Encoding Vectors,” **Justin Lovelace**, Soham Ray, Felix Wu, Kilian Q. Weinberger, Kwangyoun Kim. U.S. Patent Application No. 20250104692, Filed January 8, 2024, Patent Granted.

TEACHING EXPERIENCE

Cornell University

Instructor of Record and Course Developer

January 2024 - May 2024

CS 4782: Introduction to Deep Learning

- Served as instructor of record (with one co-instructor) for the pilot offering of Cornell’s undergraduate deep learning course; course is now part of the permanent curriculum
- Designed complete curriculum including lectures, assignments, and projects for 4000-level CS course
- Covered fundamentals of neural networks, computer vision, NLP, generative models, and reinforcement learning

SERVICE

Reviewer

- NeurIPS (2025)
- ICML (2025)
- ACL Rolling Review (2024, 2025)

- ACM Conference on Health, Inference, and Learning (2020, 2021)
- NeurIPS Machine Learning for Health (ML4H) Workshop (2019, 2020, 2021)

TECHNICAL SKILLS

Python, C++, SQL, Pytorch, Git