Xiangming Gu

Email : xiangming@u.nus.edu

Homepage: https://guxm2021.github.io

Education

- **National University of Singapore** — Singapore
  PhD candidate, Integrative Sciences and Engineering Programme — *2021/08 – 2025/12 (Expected)*
  Majored in Computer Science, Advisor: Prof. Ye Wang, GPA: 4.80/5.0
- **Tsinghua University** — Beijing, China
  B.E. in Electronic Engineering, B.S. in Finance, GPA: 3.80/4.0 — *2017/08 – 2021/06*

Experience

- **Google Deepmind** — London, United Kindom
  Student Researcher — *2025/05 – Present*
  - **Host**: *Dr. Petar Veličković and Dr. Larisa Markeeva.*
  - **Main Activity**: *Projects on (i) adding new features on penzai, which is a JAX toolkit for mechanistic interpretability. (ii) reasoning/test-time-scaling in LLMs.*
- **Sea AI Lab** — Singapore
  Research Intern — *2023/03 – 2025/04*
  - **Host**: *Dr. Tianyu Pang and Dr. Chao Du.*
  - **Main Activity**: *Projects on (i) memorization in diffusion models, published as TMLR 2025; (ii) infectious jailbreak on (multimodal) LLMs based multi-agent systems, published as ICML 2024; (iii) understanding attention sink in LLMs, published as ICLR 2025 spotlight; (iv) developing evaluation suite for trustworthy datasets based on lm-evaluation-harness; (v) advancing recipe of reinforcement learning with verifiable reward post-training for LLMs.*

Research (Google Scholar)

* denotes equal contribution, †denotes correspondence.

Understanding Generative Models

1. **Xiangming Gu**, Tianyu Pang†, Chao Du, Qian Liu, Fengzhuo Zhang, Cunxiao Du, Ye Wang†, Min Lin. When Attention Sink Emerges in Language Models: An Empirical View. *International Conference on Learning Representations* (**ICLR**), 2025. (**Spotlight**)
2. **Xiangming Gu**, Chao Du†, Tianyu Pang†, Chongxuan Li, Min Lin, Ye Wang†. On Memorization in Diffusion Models. *Transactions on Machine Learning Research* (**TMLR**), 2025.
3. Federico Barbero*†, Álvaro Arroyo*, **Xiangming Gu**, Christos Perivolaropoulos, Michael Bronstein, Petar Veličković, Razvan Pascanu. Why Do LLMs Attend to the First Token? *Conference on Language Modeling* (**COLM**), 2025.

Advancing Generative Models

1. Tongyao Zhu, Qian Liu†, Haonan Wang, Shiqi Chen, **Xiangming Gu**, Tianyu Pang, Min-Yen Kan. SkyLadder: Better and Faster Pretraining via Context Window Scheduling. *International Conference on Learning Representations Workshop on Open Science for Foundation Models* (**SCI-FM @ ICLR**), 2025.

Safety of Generative Models

1. **Xiangming Gu***, Xiaosen Zheng*, Tianyu Pang*†, Chao Du, Qian Liu, Ye Wang†, Jing Jiang†, Min Lin. Agent Smith: A Single Image Can Jailbreak One Million Multimodal LLM Agents Exponentially Fast. *International Conference on Machine Learning* (**ICML**), 2024.
2. Hongfu Liu†, Hengguan Huang, **Xiangming Gu**, Hao Wang, Ye Wang. On Calibration of LLM-based Guard Models for Reliable Content Moderation. *International Conference on Learning Representations* (**ICLR**), 2025.

Speech and Singing

1. **Xiangming Gu**, Longshen Ou, Wei Zeng, Jianan Zhang, Nicholas Wong, Ye Wang†. Automatic Lyric Transcription and Automatic Music Transcription from Multimodal Singing. *ACM Transactions on Multimedia Computing Communications and Applications* (**TOMM**), 2024.

2. **Xiangming Gu**, Wei Zeng, Ye Wang†. Elucidate Gender Fairness in Singing Voice Transcription. *ACM International Conference on Multimedia* (**MM**), 2023.

3. **Xiangming Gu***, Longshen Ou*, Danielle Ong, Ye Wang†. MM-ALT: A Multimodal Automatic Lyric Transcription System. *ACM International Conference on Multimedia* (**MM**), 2022. (**Oral, Top Paper Award**)

4. Longshen Ou*, **Xiangming Gu***, Ye Wang†. Transfer Learning of wav2vec 2.0 for Automatic Lyric Transcription. *International Society for Music Information Retrieval Conference* (**ISMIR**), 2022.

5. Yixin Wang, Wei Wei, **Xiangming Gu**, Xiaohong Guan, Ye Wang†. Disentangled Adversarial Domain Adaptation for Phonation Mode Detection in Singing and Speech. *IEEE Transactions on Audio, Speech and Language Processing* (**TASLP**), 2023.

Others

1. Hengguan Huang†, **Xiangming Gu**, Hao Wang, Chang Xiao, Hongfu Liu, Ye Wang†. Extrapolative Continuous-time Bayesian Neural Network for Predictive Streaming Domain Adaptation. *Annual Conference on Neural Information Processing Systems* (**NeurIPS**), 2022.

2. Wei Wei*, Hengguan Huang*, **Xiangming Gu**, Hao Wang, Ye Wang†. Unsupervised Mismatch Localization in Cross-Modal Sequential Data with Application to Mispronunciations Localization. *Transactions on Machine Learning Research* (**TMLR**), 2022.

3. Youze Xue, Jiansheng Chen†, **Xiangming Gu**, Huimin Ma, Hongbing Ma. Boosting Monocular 3D Human Pose Estimation with Part Aware Attention. *IEEE Transactions on Image Processing* (**TIP**), 2022.

4. Boyu Zhang, Penghui Yang, **Xiangming Gu**, Hongen Liao†. Laser Endoscopic Manipulator Using Spring-reinforced Multi-DoF Soft Actuator. *IEEE/RSJ International Conference on Intelligent Robots and Systems* (**IROS**), also *IEEE Robotics and Automation Letter* (**RA-L**), 2021.

Honors and Awards

- Dean's Graduate Research Excellence Award (School of Computing, National University of Singapore) 2024
- Research Incentive Award (School of Computing, National University of Singapore) 2023
- Research Achievement Award (School of Computing, National University of Singapore) 2022
- MM'22 Top Paper Award (Association for Computing Machinery) 2022
- MM'22 Student Travel Grant (Association for Computing Machinery) 2022
- President's Graduate Fellowship (National University of Singapore) 2021
- Visiting Undergraduate Student Scholarship (Tsinghua University) 2020
- Tsinghua's Friend – Zheng Geru Scholarship (Tsinghua University) 2018

Invited talks or posters

- Google Deepmind Team Deep Learning: Agent Frontier, invited talk on "Understanding Attention Sink in (Large) Language Models". 2025
- ASAP Seminar Series, invited talk on "When Attention Sink Emerges in Language Models: An Empirical View". 2025
- Singapore Alignment Workshop, poster presentation on "Agent Smith: A Single Image Can Jailbreak One Million Multimodal LLM Agents Exponentially Fast". 2025
- National University of Singapore Research Week Open House, invited talk on "On the Interpretability and Safety of Generative Models". 2025
- Global Young Scientists Summit, poster presentation on "Agent Smith: A Single Image Can Jailbreak One Million Multimodal LLM Agents Exponentially Fast". 2025

Professional Services

- **Conference Reviewer**: NeurIPS 2025/2024, ICML 2025, ICLR 2025, CVPR 2025, ICCV 2025/2023, ECCV 2024, ACL ARR 2025/2024, MM 2025/2024, IJCAI 2024, AISTATS 2025/2021
- **Workshop Reviewer**:

  ICLR 2025 Workshop on Deep Generative Model in Machine Learning: Theory, Principle and Efficacy

  NeurIPS 2024 Workshop on Attributing Model Behavior at Scale

  NeurIPS 2024 Safe Generative AI Workshop

- **Journal Reviewer**: TOMM, TASLP, RA-L

Teaching

- **Teaching Assistant** National University of Singapore
  CS4347/CS5647, Sound and Music Computing *Fall 2024*
- **Teaching Assistant** National University of Singapore
  CS6212, Topics in Media *Spring 2024*
- **Teaching Assistant** National University of Singapore
  CS5242, Neural Networks and Deep Learning *Spring 2023*
- **Teaching Assistant** National University of Singapore
  CS3244: Machine Learning *Fall 2022*
- **Teaching Assistant** National University of Singapore
  CS4243: Computer Vision and Pattern Recognition *Spring 2022*

Technical Skills

- **Coding**: Python, Matlab, Shell, C/C++, Html, Verilog, Assembly language, LaTeX, ...
- **Libraries**: PyTorch, JAX, Huggingface, SpeechBrain, ...