

Zheng Gao

CONTACT INFORMATION	Staff Machine Learning Engineer Coupang Mountain View, CA	(412)638-3401 woshigaozheng@gmail.com https://zhenggao.io
RESEARCH INTEREST	My research interests are primarily in the area of Graph Mining, Natural Language Processing (NLP) and Large Language Model (LLM). Particularly, I am applying deep learning techniques on the interdisciplinary field therein them to solve LLM Agent, Information Retrieval and Recommendation tasks.	
SKILL	<ul style="list-style-type: none">• Languages: Python, Java, SQL, Shell, \LaTeX• Tools: PyTorch, Docker, Spark, Maven, Lucene, MySQL, MongoDB, Neo4j	
EDUCATION	Indiana University Bloomington, United States	08/2015 - 06/2020
	Ph.D. in Information Science, Advisor: Xiaozhong Liu	
	University of Pittsburgh, United States	08/2013 - 05/2015
	M.S. in Information Science	
	Shanghai International Studies University, China	08/2009 - 05/2013
	B.M. in Information Management and System	
EXPERIENCE	Staff Machine Learning Engineer , Coupang	05/2025 - now
	<ul style="list-style-type: none">• Applied retrieval techniques in Ads tasks to enhance company-wide CVR, CTR, and GMV within Coupangs E-commerce environment.	
	Senior Algorithm Engineer , Ant Group	02/2023 - 05/2025
	<ul style="list-style-type: none">• Trained Ant Group self-innovated large language model (LLM) via supervised fine-tuning (SFT) and reinforcement learning (RL) techniques.• Developed an LLM agent platform serving hundreds of real-world applications for enterprise-wide internal management.• Implemented an LLM evaluation platform serving as the default evaluation framework for all Ant Group Artificial General Intelligence (AGI) teams.	
	Applied Scientist , Alexa AI, Amazon	06/2020 - 01/2023
	<ul style="list-style-type: none">• Led a large-scale voice application ranking project by analyzing customer utterances to enhance Alexa's natural understanding capabilities.• Contributed session-based features to Alexa core Natural Language Understanding (NLU) pipeline for customer utterance interpretation, including domain & intent classification and slot detection.	
	Data Scientist Intern , Alexa AI, Amazon	06/2019 - 09/2019
	<ul style="list-style-type: none">• Applied deep language models (i.e. Bert, ELMo) and advanced clustering techniques to extract influential text patterns from user requests, fully automating the interpretation of annotated datasets and replacing manual analysis.• Developed an automated pipeline using Spark and Shell scripts to facilitate model training from diverse data sources, including Amazon S3 and Redshift.	
	Research Intern , DAMO Academy AI Lab, Alibaba	02/2018 - 03/2019
	<ul style="list-style-type: none">• Generated product review summary from user consecutive behaviors by leveraging dynamic matrix factorization, deep reinforcement learning and neural machine translation with attention techniques.• Proposed an end-to-end pairwise ranking model with transfer learning techniques to detect communities in sparse knowledge graphs.• Detected multilevel anomalies from high dimensional dynamic use logs via adversarial autoencoder and attention-based hierarchical representation learning.	

- [1] Shutian Ma, Chengzhi Zhang, Heng Zhang, **Zheng Gao**. Citation Recommendation based on Argumentative Zoning of User Queries. *Journal of Informetrics*, 2025.
- [2] Mohamed Abdelhady, Qian Hu, Peer Mohamed, Mohamed Thahir, Wei Xiao, **Zheng Gao**, Radhika Arava, Xibin Gao. Skill Selection for Responding to Natural Language Inputs. *U.S. Patent No.12,175,968*, 2024.
- [3] Xiyao Ma, **Zheng Gao**, Qian Hu, Mohamed AbdelHady, HCL: Hybrid Contrastive Learning for Graph-based Recommendation. *International Joint Conference on Neural Networks (IJCNN)*, 2022.
- [4] Xiyao Ma, Qian Hu, **Zheng Gao**, Mohamed AbdelHady, Contrastive Co-training for Diversified Recommendation. *International Joint Conference on Neural Networks (IJCNN)*, 2022.
- [5] Xiyao Ma, **Zheng Gao**, Qian Hu, Mohamed AbdelHady, Contrastive Knowledge Graph Attention Network for Request-based Recipe Recommendation. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2022.
- [6] **Zheng Gao**, Chun Guo, Shutian Ma, Xiaozhong Liu. Improving Community Detection Performance in Heterogeneous Music Network by Learning Edge-type Usefulness Distribution. *International Conference on Information*, 2022.
- [7] **Zheng Gao**, Radhika Arava, Qian Hu, Xibin Gao, Thahir Mohamed, Wei Xiao, Mohamed AbdelHady. Paraphrase Label Alignment for Voice Application Retrieval in Spoken Language Understanding. *Interspeech*, 2021.
- [8] **Zheng Gao**, Mohamed AbdelHady, Radhika Arava, Xibin Gao, Qian Hu, Wei Xiao, and Thahir Mohamed. X-SHOT: Learning to Rank Voice Applications via Cross-Locale Shard-based Co-Training. *IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*, 2021.
- [9] Xibin Gao, Radhika Arava, Qian Hu, Thahir Mohamed, Wei Xiao, **Zheng Gao** and Mohamed AbdelHady. Graphire: Novel Intent Discovery with Pretraining on Prior Knowledge using Contrastive Learning. *KDD Workshop on Pretraining: Algorithms, Architectures, and Applications*, 2021.
- [10] Wei Xiao, Qian Hu, Thahir Mohamed, **Zheng Gao**, Xibin Gao, Radhika Arava, Mohamed AbdelHady. Two-stage Voice Application Recommender System for Unhandled Utterances in Intelligent Personal Assistant. *KDD 2nd International Workshop: Industrial Recommendation Systems*, 2021.
- [11] Qian Hu, Thahir Mohamed, Wei Xiao, **Zheng Gao**, Xibin Gao, Radhika Arava, Xiyao Ma, Mohamed AbdelHady. Collaborative Data Relabeling for Robust and Diverse Voice Apps Recommendation in Intelligent Personal Assistants. *EMNLP Third Workshop on NLP for Conversational AI*, 2021.
- [12] **Zheng Gao**, Hongsong Li, Zhuoren Jiang, Xiaozhong Liu. Detecting User Community in Sparse Domain via Cross-Graph Pairwise Learning. *ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2020.
- [13] **Zheng Gao**, Lujun Zhao, Heng Huang, Hongsong Li, Changlong Sun, Luo Si, Xiaozhong Liu. Behavior based Dynamic Summarization on Product Aspects via Reinforcement Neighbour Selection. *European Conference on Artificial Intelligence (ECAI)*, 2020.
- [14] Zhuoren Jiang, **Zheng Gao**, Jinjiong Lan, Hongxia Yang, Yao Lu and Xiaozhong Liu. Task-Oriented Genetic Activation for Large-Scale Complex Heterogeneous Graph Embedding. *The Web Conference (WWW)*, 2020.
- [15] **Zheng Gao**, Chun Guo, Xiaozhong Liu. Efficient Personalized Community Detection via Genetic Evolution. *The Genetic and Evolutionary Computation Conference (GECCO)*, 2019.
- [16] **Zheng Gao**, Gang Fu, Chungping Ouyang, Satoshi Tsutsui, Xiaozhong Liu, Jeremy Yang, Christopher Gessner, Brian Foote, David Wild, Ying Ding, Qi Yu. edge2vec: Representation Learning Using Edge Semantics for Biomedical Knowledge Discovery. *BMC Bioinformatics*, 2019.
- [17] Yongzhen Wang, Xiaozhong Liu, **Zheng Gao**. Neural Related Work Summarization with a Joint Context-driven Attention Mechanism. *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2018.
- [18] Zizhe Gao, **Zheng Gao**, Heng Huang, Zhuoren Jiang, Yuliang Yan. An End-to-end Model of Predicting Diverse Ranking On Heterogeneous Feeds. *eCOM Workshop at ACM SIGIR Conference on Research and Development in Information Retrieval (eCom-SIGIR)*, 2018.
- [19] **Zheng Gao**, Lin Guo, Chi Ma, Xiao Ma, Kai Sun, Hang Xiang, Xiaoqiang Zhu, Hongsong Li, Xiaozhong Liu. AMAD: Adversarial Multiscale Anomaly Detection on High-Dimensional and Time-Evolving Categorical Data. *Deep Learning Practice for High-Dimensional Sparse Data Workshop at ACM SIGKDD Conference on Knowledge Discovery and Data Mining (DLP-KDD)*, 2019.

- [20] Zhuoren Jiang, Liangcai Gao, Ke Yuan, **Zheng Gao**, Zhi Tang, Xiaozhong Liu. Mathematics Content Understanding for Cyberlearning via Formula Evolution Map. *ACM International Conference on Information and Knowledge Management (CIKM)*, 2018.
- [21] Xiaozhong Liu, Xing Yu, **Zheng Gao**, Tian Xia, Johan Bollen. Comparing Community-based Information Adoption and Diffusion across Different Microblogging Sites. *ACM Conference on Hypertext and Social Media*, 2016.
- [22] Linlin Zhang, Chunping Ouyang, Fuyu Hu, Yongbin Liu, **Zheng Gao**. Relational Topology-based Heterogeneous Network Embedding for Predicting Drug-Target Interactions. *Data Intelligence*, 2023
- [23] **Zheng Gao**, Vincent Malic, Shutian Ma, Patrick Shih. How to Make a Successful Movie: Factor Analysis from both Financial and Critical Perspectives. *International Conference on Information*, 2019.
- [24] Yongzhen Wang, Yan Lin, **Zheng Gao**, Yan Chen. A Two-stage Iterative Approach to Improve Crowdsourcing-based Relevance Assessment. *Arabian Journal for Science and Engineering*, 2019.
- [25] **Zheng Gao**, John Wolohan, Fast NLP-based Pattern Matching in Real Time Tweet Recommendation. *Text REtrieval Conference (TREC)*, 2017.
- [26] **Zheng Gao**, Rui Bi. University of Pittsburgh at TREC 2014 Microblog Track. *Text REtrieval Conference (TREC)*, 2014.
- [27] **Zheng Gao**, Xiaozhong Liu. Personalized Community Detection in Scholarly Network. *International Conference on Information*, 2017.
- [28] Tian Xia, Xing Yu, **Zheng Gao**, Yijun Gu, Xiaozhong Liu. Internal/External Information Access and Information Diffusion in Social Media. *International Conference on Information*, 2017.

SELECTED SERVICE

Conference Reviewer & PC Member

- The Conference on Information and Knowledge Management (CIKM 2025)
- ACM International Conference on Web Search and Data Mining (WSDM 2023,2024,2025)
- AAAI Conference on Artificial Intelligence (AAAI 2022,2023,2024,2025)
- Annual Meeting of the Association for Computational Linguistics (ACL 2024)
- The Conference on Empirical Methods in Natural Language Processing (EMNLP 2022)
- The Web Conference (WWW 2019, 2020)
- ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2018, 2022)
- IEEE International Conference on Big Data (BigData 2020, 2022)
- Joint Conference on Digital Libraries (JCDL 2021, 2022)

Journal Reviewer

- IEEE Transactions on Knowledge and Data Engineering (TKDE 2025)
- Data Intelligence (2022)
- The Social Science Journal (2022)
- Journal of Informetrics (JOI 2021)
- Computers in Industry (2021)
- Journal of the Association for Information Science and Technology (JASIST 2019,2021)
- PeerJ Computer Science (2020)
- PLoS ONE (2020,2021)
- BMC Bioinformatics (2019,2020,2022)
- Social Network Analysis and Mining (SNAM 2019,2020,2021)
- Medical Science Monitor (2019)
- ACM Transactions on Computing for Healthcare (2020)

AWARD

- Tung-li Yuan Memorial Fellowship, Indiana University Bloomington
- Clayton A. Shepherd Scholarship, Indiana University Bloomington