

# ZIXUAN KE

Website ◇ Github ( $\approx$ 1k stars) ◇ Google Scholar ( $\approx$ 2.5k citations, 25 h-index) ◇ zke4@uic.edu

## BIOGRAPHY

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I am a research scientist at the Salesforce AI Research. My research studies how to build a **lifelong foundation models**, for an **ever-changing world** characterized by **emerging** domains, events, topics or information. This includes (but not limited to) (1) **Reasoning and Agents** (Preprint26, TMLR25, SEA@NeurIPS26) (2) **Post-training** (EMNLP25, ACL24, ICLR23, EMNLP22a, EMNLP22b); (3) **Continual and Lifelong Learning** (ICML23, NeurIPS20,21,22, Preprint22; (4) **NLP** (EMNLP23, NAACL21, EMNLP21; (5) **Argument Mining** (ACL18,19; IJCAI18,19).

## EDUCATION

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**Ph.D., University of Illinois at Chicago** *Aug. 2019 - May 2024*  
Ph.D. in Computer Science. GPA 4.0/4.0. Advisor: Bing Liu  
Large Language Model and Continual Learning

**M.Sc., The University of Texas at Dallas** *Aug. 2017 - Jun. 2019*  
M.Sc. in Computer Science. Advisor: Vincent Ng  
Argument Mining

**B.Sc., South China Agricultural University** *Aug. 2013 - Jun. 2017*  
B.Sc. in Computer Science

## INDUSTRY EXPERIENCE

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**Salesforce AI Research, Research Scientist** *May 2024 - present, Palo Alto, CA*  
Agents, Reasoning and Post-training. Manager: Shafiq Joty

**Google DeepMind, Research Intern** *Summer 2023, Mountain View, CA*  
Retrieval-augmented Generation. Mentors: Weize Kong, Cheng Li, Mingyang Zhang and Qiaozhu Mei  
ACL24: Bridging the Preference Gap between Retrievers and LLMs

**Meta AI, Research Intern** *Summer 2022, Menlo Park, CA*  
Continual Conversational Summarization. Mentors: Haoran Li, Wenhan Xiong and Asli Celikyilmaz  
EMNLP23: Sub-network Discovery and Soft-masking for Continual Learning of Mixed Tasks

**Amazon Science, Applied Scientist Intern** *Summer 2021, Seattle, WA*  
Multi-domain Imbalanced Learning. Mentors: Mohammad Kachuee and Sungjin Lee  
Preprint: Domain-Aware Contrastive Knowledge Transfer for Multi-domain Imbalanced Data

**Tencent AI Lab, Research Intern** *Summer 2020, Sunnyvale, CA (Remote)*  
Document Grounded Dialogue Generation. Mentors: Chen Li and Xiaoyang Wang

**Alibaba Group, Research Intern** *Summer 2019, Hangzhou, China*  
Semantic Matching for E-commerce Search Engine. Mentors: Hongbo Deng

**IBM, Research Intern** *Summer 2016, Shenzhen, China*  
Dialogue Act Classification for E-Commerce Chatbot.

## PROFESSIONAL ACTIVITIES

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Invited Talks & Classes:

- Toward Effective and Efficient Multi-Agent Systems  
Live Talk at CAMEL, Jan 23, 2026
- Adaptation of Large Lanaguge Models  
Tutorial at NAACL, May 3, 2025  
Talk at Visa Research, Mar 4, 2025
- Adapting Large Language Models for the Dynamic World  
Talk at Snowflake, Feb 1, 2024  
Talk at Salesforce AI Researsch, Jan 11, 2024  
Talk at Google DeepMind, Nov 9, 2023
- Continual Pre-training in Language Models , Talk at ContinualAI, Remote, April 27, 2023.
- Continual Learning in NLP. Tutorial at DEIM23, Remote, March 6, 2023
- Lifelong and Continual Learning. A Short PhD Course, Aalborg University, 2022.

## SELECTED PUBLICATIONS

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- [1] **MAS-Orchestra: Understanding and Improving Multi-Agent Reasoning Through Holistic Orchestration and Controlled Benchmarks**  
**Zixuan Ke**, Yifei Ming, Austin Xu, ..., Semih Yavuz, Caiming Xiong, Shafiq Joty  
*Preprint*, 2026
- [2] **Demystifying Domain-adaptive Post-training for Financial LLMs**  
**Zixuan Ke**, Yifei Ming, Xuan-Phi Nguyen, Caiming Xiong, Shafiq Joty  
*Empirical Methods in Natural Language Processing (EMNLP)*, 2025. **Oral**
- [3] **MAS-Zero: Designing Multi-Agent Systems with Zero Supervision**  
**Zixuan Ke**, Austin Xu, Yifei Ming, Xuan-Phi Nguyen, Caiming Xiong, Shafiq Joty  
*SEA@NeurIPS*, 2025. **Oral**
- [4] **A Survey of Frontiers in LLM Reasoning: Inference Scaling, Learning to Reason, and Agentic Systems**  
**Zixuan Ke**, Fangkai Jiao, Yifei Ming, Xuan-Phi Nguyen, Austin Xu, Do Xuan Long, Minzhi Li, Chengwei Qin, Peifeng Wang, Silvio Savarese, Caiming Xiong, Shafiq Joty  
*NeurIPS Tutorial*, 2025; *Transaction on ML Research (TMLR)*, 2025. **Survey Certification Award**
- [5] **Bridging the Preference Gap between Retrievers and LLMs**  
**Zixuan Ke**, Weize Kong, Cheng Li, Mingyang Zhang, Qiaozhu Mei, Michael Bendersky  
*Association for Computational Linguistic (ACL)*, 2024
- [6] **Continual Pre-training of Language Models**  
**Zixuan Ke\***, Yijia Shao\*, Haowei Lin\* and Bing Liu  
*International Conference on Learning Representations (ICLR)*, 2023
- [7] **Sub-network Discovery and Soft-masking for Continual Learning of Mixed Tasks**  
**Zixuan Ke**, Bing Liu, Wenhan Xiong, Asli Celikyilmaz, and Haoran Li  
*Findings of Empirical Methods in Natural Language Processing (EMNLP-Findings)*, 2023
- [8] **Parameter-level Soft-masking for Continual Learning**  
Tatsuya Konishi, Mori Kurokawa, Chihiro Ono, **Zixuan Ke**, Gyuhak Kim, and Bing Liu  
*International Conference on Machine Learning (ICML)*, 2023
- [9] **Adapting a Language Model While Preserving its General Knowledge**  
**Zixuan Ke**, Yijia Shao, Haowei Lin, Hu Xu, Lei Shu and Bing Liu  
*Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022a

- [10] **Continual Training of Language Models for Few-Shot Learning**  
Zixuan Ke, Haowei Lin, Yijia Shao, Hu Xu, Lei Shu and Bing Liu  
*Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022b
- [11] **A Theoretical Study on Solving Continual Learning**  
Gyuhak Kim, Changnan Xiao, Tatsuya Konishi, Zixuan Ke, Bing Liu  
*Advances in Neural Information Processing Systems (NeurIPS)*, 2022
- [12] **A Multi-Head Model for Continual Learning via Out-of-Distribution Replay**  
Gyuhak Kim, Zixuan Ke, Bing Liu  
*Conference on Lifelong Learning Agents (CoLLAs)*, 2022
- [13] **Continual learning of natural language processing tasks: A survey**  
Zixuan Ke and Bing Liu  
*Preprint*, 2022
- [14] **Achieving Forgetting Prevention and Knowledge Transfer in Continual Learning**  
Zixuan Ke, Bing Liu, Nainzu Ma, Hu Xu and Lei Shu  
*Advances in Neural Information Processing Systems (NeurIPS)*, 2021
- [15] **CLASSIC: Continual and Contrastive Learning of Aspect Sentiment Classification Tasks**  
Zixuan Ke, Bing Liu, Hu Xu and Lei Shu  
*Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2021
- [16] **Adapting BERT for Continual Learning of a Sequence of Aspect Sentiment Classification Tasks**  
Zixuan Ke, Hu Xu and Bing Liu  
*Conference of the North American Chapter of Association for Computational Linguistics: Human Language Technologies (NAACL-HLT)*, 2021
- [17] **Continual Learning of a Mixed Sequence of Similar and Dissimilar Tasks**  
Zixuan Ke, Bing Liu and Xingchang Huang  
*Advances in Neural Information Processing Systems (NeurIPS)*, 2020
- [18] **Continual Learning with Knowledge Transfer for Sentiment Classification**  
Zixuan Ke, Bing Liu, Hao Wang and Lei Shu  
*European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD)*, 2020
- [19] **Automated Essay Scoring: A Survey of The State of the Art**  
Zixuan Ke and Vincent Ng  
*International Joint Conference on Artificial Intelligence (IJCAI)*, 2019
- [20] **Give Me More Feedback II: Annotating Thesis Strength and Related Attributes in Student Essays**  
Zixuan Ke, Hrishikesh Inamdar, Hui Lin and Vincent Ng  
*Association for Computational Linguistic (ACL)*, 2019
- [21] **Learning to Give Feedback: Modeling Attributes Affecting Argument Persuasiveness in Student Essays**  
Zixuan Ke, Winston Carlile, Nishant Gurrapadi and Vincent Ng  
*International Joint Conference on Artificial Intelligence (IJCAI)*, 2018
- [22] **Give me more feedback: Annotating argument persuasiveness and related attributes in student essays**  
Winston Carlile, Nishant Gurrapadi, Zixuan Ke and Vincent Ng  
*Annual Meeting of the Association for Computational Linguistics (ACL)*, 2018