

# ZIXUAN KE

Website ◊ Github ( $\approx 1k$  stars) ◊ Google Scholar ( $\approx 25$  papers, 2k citations, 20 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 adapt the **foundation models**, particularly **large language models (LLMs)**, for an **ever-changing world** characterized by **emerging** domains, events, topics or information. This includes (but not limited to) (1) **Reasoning and Agents** (TMLR25, SEA@NeurIPS) (2) **LLM post-training** (EMNLP25, ACL24, ICLR23, EMNLP22a, EMNLP22b); (3) **Continual and Lifelong Learning (task, class, and domain-incremental)** (ICML23, NeurIPS20), 21, 22; (4) **NLP** (EMNLP23, NAACL21, EMNLP21; (5) **Argument Mining** (ACL18, 19; IJCAI18, 19).

## EDUCATION

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<b>Ph.D., University of Illinois at Chicago</b> Ph.D. in Computer Science. GPA 4.0/4.0. Advisor: Bing Liu Large Language Model and Continual Learning	<i>Aug. 2019 - May 2024</i>
<b>M.Sc., The University of Texas at Dallas</b> M.Sc. in Computer Science. Advisor: Vincent Ng Argument Mining	<i>Aug. 2017 - Jun. 2019</i>
<b>B.Sc., South China Agricultural University</b> B.Sc. in Computer Science	<i>Aug. 2013 - Jun. 2017</i>

## INDUSTRY EXPERIENCE

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<b>Salesforce AI Research, Research Scientist</b> Agents, LLM Reasoning, Post-training. Manager: Shafiq Joty	<i>May 2024 - present, Palo Alto, CA</i>
<b>Google DeepMind, Research Intern</b> Retrieval-augmented Generation. Mentors: Weize Kong, Cheng Li, Mingyang Zhang and Qiaozhu Mei ACL24: Bridging the Preference Gap between Retrievers and LLMs	<i>Summer 2023, Mountain View, CA</i>
<b>Meta AI, Research Intern</b> Continual Conversational Summarization. Mentors: Haoran Li, Wenhan Xiong and Asli Celikyilmaz EMNLP23: Sub-network Discovery and Soft-masking for Continual Learning of Mixed Tasks	<i>Summer 2022, Menlo Park, CA</i>
<b>Amazon Science, Applied Scientist Intern</b> Multi-domain Imbalanced Learning. Mentors: Mohammad Kachuee and Sungjin Lee Preprint: Domain-Aware Contrastive Knowledge Transfer for Multi-domain Imbalanced Data	<i>Summer 2021, Seattle, WA</i>
<b>Tencent AI Lab, Research Intern</b> Document Grounded Dialogue Generation. Mentors: Chen Li and Xiaoyang Wang	<i>Summer 2020, Sunnyvale, CA (Remote)</i>
<b>Alibaba Group, Research Intern</b> Semantic Matching for E-commerce Search Engine. Mentors: Hongbo Deng	<i>Summer 2019, Hangzhou, China</i>
<b>IBM, Research Intern</b> Dialogue Act Classification for E-Commerce Chatbot.	<i>Summer 2016, Shenzhen, China</i>

## AWARDS AND PROFESSIONAL ACTIVITIES

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## Invited Talks & Classes:

- Adaptation of Large Lanaguge Models  
Tutorial at NAACL, May 3, 2025
- Adapting Large Language Models for the Dynamic World  
Talk at Snowflake, Feb 1, 2024  
Talk at Salesforce AI Reseasrch, 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.

## PEER-REVIEWED PUBLICATIONS

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- [1] **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**
- [2] **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
- [3] **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**
- [4] **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
- [5] **Continual Pre-training of Language Models**  
**Zixuan Ke\***, Yijia Shao\*, Haowei Lin\* and Bing Liu  
*International Conference on Learning Representations (ICLR)*, 2023
- [6] **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
- [7] **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
- [8] **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
- [9] **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
- [10] **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

- [11] **A Multi-Head Model for Continual Learning via Out-of-Distribution Replay**  
Gyuhan Kim, **Zixuan Ke**, Bing Liu  
*Conference on Lifelong Learning Agents (CoLLAs)*, 2022
- [12] **Partially Relaxed Masks for Knowledge Transfer Without Forgetting in Continual Learning**  
Tatsuya Konishi, Mori Kurokawa, Chihiro Ono, **Zixuan Ke**, Gyuhan Kim, Bing Liu  
*Advances in Knowledge Discovery and Data Mining (PAKDD)*, 2022
- [13] **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
- [14] **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
- [15] **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
- [16] **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
- [17] **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
- [18] **Automated Essay Scoring: A Survey of The State of the Art**  
**Zixuan Ke** and Vincent Ng  
*International Joint Conference on Artificial Intelligence (IJCAI)*, 2019
- [19] **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
- [20] **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
- [21] **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

## PREPRINTS

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- [1] **Continual learning of natural language processing tasks: A survey**  
**Zixuan Ke** and Bing Liu  
*arXiv*, 2022