

# Xiangyang Zhou

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I became a member of PaddlePaddle since March 2019.

I joined Baidu in July 2012, and I have been working for the Natural Language Processing (NLP) department of Baidu for around 7 years and I am currently a *staff research & development engineer (T8)* in the PaddlePaddle team of Baidu. My area of interests include human-computer conversation (chatbots), question-answering, deep learning and its application in natural language processing.

## Notable Projects

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### Human-Computer Conversation (chatbots)

**Baidu-NLP**

○ *Staff Research & Development Engineer (T8)*

*July 2014–Now*

- **Supervisor:** Dianhai Yu (Currently the Principle Research & Development Engineer (T10))
- **Responsibility:** In charge of building conversational agents (chatbots), exploring better model/system architectures, and providing technical support to the whole business of Baidu.
- **Research:** Led research topics in both fields of the retrieval-based chatbots and the generation-based chatbots. Work together with team members to fight against most challenging tasks in chatbots, including *multi-turn response selection*, *learning from dialog feedbacks using reinforcement learning (RL)* and *generative adversarial networks (GAN)*, *improving seq2seq-based dialogue generation with copy mechanism* and *the automatic evaluation of dialogue systems*. Many of our works have been published at top NLP/AI conferences, like ACL, EMNLP, CIKM, etc., demonstrating the strong power of Chinese AI research.
- **Industry Application:** Led the industrial application of chatbots, including building IR-based chatbots with billions of dialogue corpus and deploying it as web services at [ai.baidu.com](http://ai.baidu.com) with our team members. Our chatbots technology have already supported many industrial applications such as **Duer** (a.k.a DuerOS or Xiaodu), **Baidu NewsFeed**, **Baidu Tieba**, **Baidu Interactive Search**, **Baidu Smart Airports** and the other business inside/outside the company.

### Entity Search in Baidu Search Engine

**Baidu-NLP**

○ *Advanced Research & Development Engineer (T5)*

*Dec 2012–July 2014*

- **Supervisor:** Shiqi Zhao (Currently the Director of Baidu NewsFeed)
- **Responsibility:** In charge of improving the entity search system in Baidu search engine.
- **Proposed Method:** We proposed a novel domain-agnostic mining algorithm that can automatically discover entity-seeking-queries and their answers using the joint user behaviors from Baidu web search and Baidu Zhidao (the largest Chinese Community Question-Answering platform).
- **Achievement:** Our mining algorithm can discover hundreds of thousands fresh entity-seeking question-answer pairs every single day, covering popular domains such as music, movies, books, video-games etc. Our proposed mining algorithm has been integrated into Baidu search engine, which can directly show a list of entity answers, at the top of page search results, for every entity-seeking-query, making the life of billions Chinese internet users, especially at mobile devices, easier and happier.

### CQA Answer Ranking in Baidu Zhidao

**Baidu-NLP**

○ *Research & Development Engineer (T3)*

*July 2012–Dec 2012*

I implemented a perceptron-based Learning to Rank (LTR) model for ranking answers in CQA, this model is trained with a modified pairwise hinge loss,  $L = \sum_i \Lambda_i * (I(f(x_{+1}) - f(x_{-1}) < m)) + \|\theta\|_2^2$ , where  $\Lambda_i$  is a weight factor telling the model how reliable this instance is, in order to improve the model robustness.

**Achievement:** We evaluated our model on 100 CQA questions along with answers collected from *Baidu Zhidao*, it archived 92% P@1 which is comparable to the state-of-the art models. It was integrated into the ranking model of Baidu search engine as a feature to improve user experience.

## Internship

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- **Full-time Intern** **Microsoft Research Asia - NLC**  
Dec 2010– June 2012  
*Extracting social events for tweets using a factor graph,*  
Did research in the field of events extraction and factor graphical models advised by Xiaohua Liu. Implemented a factor-graphical-model in C# with maximum clique size 2, which can be seen as an advanced Conditional Random Field (CRF) model. Published our work in AAAI-2012.

## Selected Publications

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- **Proactive Human-Machine Conversation with Explicit Conversation Goal (ACL-2019, full-paper)**  
Wenquan Wu, Zhen Guo, **Xiangyang Zhou**, Hua Wu, Xiyuan Zhang, Rongzhong Lian and Haifeng Wang.
- **Multi-Turn Response Selection for Chatbots with Deep Attention Matching Network (ACL-2018, full-paper)**  
**Xiangyang Zhou**, Lu Li, Daxiang Dong, Yi Liu, Ying Chen, Wayne Xin Zhao, Dianhai Yu and Hua Wu.
- **Multi-View Response Selection for Human-Computer Conversation (EMNLP-2016, full-paper)**  
**Xiangyang Zhou**, Daxiang Dong, Hua Wu, Shiqi Zhao, Rui Yan, Dianhai Yu, Xuan Liu, Hao Tian.
- **"Shall I Be Your Chat Companion?" Towards an Online Human-Computer Conversation System (CIKM-2016, full-paper)**  
Rui Yan, Yiping Song, **Xiangyang Zhou**, Hua Wu.
- **Extracting Social Events for Tweets Using a Factor Graph (AAAI-2012, full-paper)**  
Xiaohua Liu, **Xiangyang Zhou**, Zhongyang Fu, Furu Wei, Ming Zhou.
- **Joint Inference of Named Entity Recognition and Normalization for Tweets (ACL-2012, full-paper)**  
Xiaohua Liu, Ming Zhou, **Xiangyang Zhou**, Zhongyang Fu, Furu Wei.
- **Collective Nominal Semantic Role Labeling for Tweets (AAAI-2012, full-paper)**  
Xiaohua Liu, Zhongyang Fu, **Xiangyang Zhou**, Furu Wei, Ming Zhou.

## Education

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- **Computer Science and Technology** **Shandong University**  
2007–2012  
*Bachelor degree*

## Awards

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- Outstanding Engineer of Baidu NLP department
- Outstanding Fresh Engineer of Baidu NLP department
- Best Undergraduate Thesis of Shandong Province
- Outstanding Undergraduate of Shandong University
- Brown Medal of 34th ACM-ICPC Tianjin Contest

## Skills

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- **Machine Learning** Familiar with machine learning application. Skilled in tensorflow, theano and other machine learning tools.
- **Programming** Familiar python, c/c++, c#, large-scale online program writing and some skills in speeding up deep learning codes.

## Services

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- Program Committee member of AAAI-2019, ACL-2019
- Reviewer of ACM Transactions on Intelligent Systems and Technology
- Preparing the Knowledge-driven Completion Track, with CCF and CIPS, for Language & Intelligence Contest 2019

## Others

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Whenever I am not working, I like watching movies or going hiking with my friends, also I like reading the history of human beings in different cultures. Sometimes I kill time by practicing in some short-term technical contests about coding, algorithm or machine learning. By the way, I am a DOTA2 (the Defense of The Ancient 2) player and I won the champion of Baidu DOTA league **twice** as captain :p.