

# Songlin Zhai

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**Negative Sampling in Visual Semantic Embedding; KBQA**



## Education

**Northeastern University**

**Master**

*Software Engineering (The first place in the National Post-graduate Entrance Examination)* Sep., 2017 — Now

**Yanshan University**

**Bachelor**

*Computer Science and Technology (GPA : 3.30/4.00, ranked within Top 10%)* Sept., 2013 — Jul., 2017

## Publications

1. **VSE-ens: Visual Semantic Embeddings with Efficient Negative Sampling** AAAI'18 Co-first author  
*Guibing Guo, Songlin Zhai, Fajie Yuan, Yuan Liu, Xingwei Wang*
2. **Improving Visual Semantic Embedding with Fast Negative Sampling** ACM TOIS *Under review*  
*Songlin Zhai, Guibing Guo, Fajie Yuan, Yuan Liu, Xingwei Wang*
3. **VSE-fs: Fast Full-sample Visual Semantic Embedding** IEEE Intelligent Systems *Under review*  
*Songlin Zhai, Guibing Guo, Fajie Yuan, Yuan Liu, Xingwei Wang*
4. **CLEAR: Collectively Linking Entity and Relation for Question Answering over Knowledge Bases**  
This work was done during Songlin Zhai's internship at Tencent AI Lab. AAAI'20 *Under review*  
*Songlin Zhai, Jialong Han, Guibing Guo, Yuan Liu*

## Projects and Work experiences

### 1. Intern at NLP center, Tencent AI Lab.....

**2019 Tencent Rhino-Bird Elite Training Program**

**Apr., 2019 — Sept., 2019**

*Enterprise mentors: Jialong Han and Shuming Shi*

Focus on Knowledge Base Question Answering. Have submitted CLEAR paper to AAAI'20 (Publications #4)

- Incorporate Question Template and Relation into Entity Linking phase to further alleviate the problem of “name ambiguity”. Surpass the state-of-the-art baseline by a 18.6% improvement in *EL*.
  - Incorporate Entity Type and Relation Type into Relation Linking phase to improve the accuracy of *RL*. Surpass the state-of-the-art baseline by a 31.6% improvement in *RL*.
  - Jointly train *EL* and *RL* sub-tasks to achieve the above Mutual Reinforcement Effects
  - Our collectively linking model aims to rectify the cases that can not be alone performed correctly in *EL* or *RL*
  - CLEAR surpasses the state-of-the-art baseline by a 1.7% improvement in answer accuracy
- P.S.: Reported results are based on *SimpleQuestions* benchmark, since we focus on single-relation QA.

### 2. Cooperative project with the School of Resources and Civil Engineering.....

**Innovation research group cultivation**

**Technical Director**

*Key Members: Wanchen Zhu, Penghai Zhang, Guibing Guo, Songlin Zhai*

*May, 2018 — May, 2019*

- o Predict the degree of rock failure based on linear regression model.
  - o Predict the degree of rock failure based on convolutional neural network.
  - o Predict the degree of rock failure based on recurrent neural network.
  - o Build a cloud platform to assess the degree of rock failure for the prediction of disaster.
- Our well-designed model reduces MSE (Mean Square Error) to 0 on the given dataset.

### 3. RuanKo Network Technology Co. Ltd.....

#### **Pocket Guide System on Android**

**Project Leader**

*Java Project*

*Jun., 2016 — Sept., 2017*

- o Develop a Pocket Guide Software based on Android
- o This application includes modules of tourist attractions, weather forecast, map navigation, system settings and help.
- o Line of Code (LOC): 7000; Code defect 5%.

## **Honors and Awards**

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**Apr., 2019:** Elected to the 2019 Tencent Rhino-Bird Elite Training Program

**Nov., 2018:** National Scholarship for Postgraduate Students

**Sept., 2018:** The Second Prize Scholarship of Northeastern University

**Sept., 2017:** The First Prize Scholarship of Northeastern University

**Jun., 2016:** Honored as "Outstanding Individual" in the RuanKo program

**Jun., 2016:** The internship program at RuanKo is rated *Grade:A*

**Sept., 2015:** HuaRun Grants

**Sept., 2013 — Jul., 2017:** Many times gained The First or Second Prize Scholarship; Merit Student during undergraduate period