

Tianyu Gao

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Education

Tsinghua University

B. ENG. IN COMPUTER SCIENCE AND TECHNOLOGY

- Member of **Tsinghua Natural Language Processing (NLP) Lab**
- Advisor: Prof. **Zhiyuan Liu** (<http://nlp.csai.tsinghua.edu.cn/~lzy/>)
- **Tsinghua University Initiative Scientific Research Program Fellow**
- Member of the Student Union and the Student Association of Science and Technology

Beijing, China

Aug. 2016 - June 2020

Preprints

[1] KEPLER: A Unified Model for Knowledge Embedding and Pre-trained Language Representation

Arxiv Preprint, 2019

XIAOZHI WANG, **TIANYU GAO**, ZHAOCHENG ZHU, ZHIYUAN LIU, JUANZI LI, JIAN TANG.

Work in Progress

- Proposed **a unified model for knowledge embedding and pre-trained language representation** (KEPLER)
- Incorporated world knowledge into NLP models implicitly with zero inference overhead
- Achieved superior performance in both language and knowledge graph tasks

Publications

[2] Neural Snowball for Few-Shot Relation Learning

Accepted by AAAI 2020

TIANYU GAO, XU HAN, RUOBING XIE, ZHIYUAN LIU, FEN LIN, LEYU LIN, MAOSONG SUN.

Long Paper

- Proposed Neural Snowball, a bootstrapping approach that can learn new relations with only a few seeds
- **Transferred semantic knowledge of existing relations** by using Relational Siamese Networks

[3] FewRel 2.0: Towards More Challenging Few-Shot Relation Classification

In Proceedings of EMNLP 2019

TIANYU GAO, XU HAN, HAO ZHU, ZHIYUAN LIU, PENG LI, MAOSONG SUN, JIE ZHOU.

Short Paper

- Proposed the second version of FewRel dataset to investigate two aspects of few-shot models:
- (1) Can they adapt to a new domain with only a handful of instances (**domain adaptation**)?
- (2) Can they detect **none-of-the-above** relations?
- Showed that existing models cannot handle the new challenges well and suggested that more efforts are needed

[4] OpenNRE: An Open and Extensible Toolkit for Neural Relation Extraction

In Proceedings of EMNLP 2019

XU HAN*, **TIANYU GAO***, YUAN YAO, DEMING YE, ZHIYUAN LIU, MAOSONG SUN (* INDICATES EQUAL CONTRIBUTIONS).

System Demonstrations

- Developed OpenNRE, **an open and extensible toolkit for relation extraction**, covering several settings and models
- Allowed users to deploy models with only a few lines of codes with our easy-to-use interfaces
- Enabled researchers to build and test their models more efficiently with our modular framework
- Released an online DEMO (<http://opennre.thunlp.ai>) providing four different settings of relation extraction
- Our Github repository (<https://github.com/thunlp/OpenNRE>) has received more than **2,000** stars!

[5] Hybrid Attention-Based Prototypical Networks for Noisy Few-Shot Relation Classification

In Proceedings of AAAI 2019

TIANYU GAO*, XU HAN*, ZHIYUAN LIU, MAOSONG SUN (* INDICATES EQUAL CONTRIBUTIONS).

Long Paper

- Tackled the problem of few-shot relation classification in noisy scenarios
- Added **instance-level attention** and **feature-level attention** to Prototypical Networks
- Achieved great improvement on accuracy and convergence speed compared to baseline models

Projects

NREpapers: A Paper List for Neural Relation Extraction

[HTTPS://GITHUB.COM/THUNLP/NREPAPERS](https://github.com/thunlp/nrepapers)

- Summarized important papers in relation extraction

FewRel: FewRel Dataset, Toolkits and Baseline Models

[HTTPS://GITHUB.COM/THUNLP/FEVREL](https://github.com/thunlp/fevrel)

- FewRel is a large-scale few-shot relation extraction dataset proposed by our lab.
- Helped with implementing the toolkit and several baseline models

Experiences

Mila-Quebec AI Institute

VISITING STUDENT WITH PROF. JIAN TANG

- Researched on how to model the uncertainty of entities in knowledge graphs
- Studied how to fuse the information from knowledge graphs into pre-trained language representation models [1]

Montreal, Canada

July 2019 - Sept. 2019

WeChat AI, Tencent Inc.

INTERN DIRECTED BY DR. PENG LI

- Focused on **few-shot learning in relation extraction**
- Proposed a new dataset tackling two long-neglected challenges in few-shot [2]

Beijing, China

May 2019 - Present

Tsinghua NLP Lab

STUDENT RESEARCH ASSISTANT WITH PROF. ZHIYUAN LIU

- My research topic is **low-resource relation extraction**.
- Studied how machines can learn relational patterns more efficiently (**few-shot learning**) [3] [5]
- Researched on how to mine useful information from unlabeled corpora more effectively (**bootstrapping**) [2]
- Developed **OpenNRE**, an open and extensible relation extraction toolkit to advance this field [4]

Beijing, China

Nov. 2017 - Present

Momenta

INTERN DIRECTED BY DR. JI LIANG

- Worked on semantic segmentation, part of the self-driving car perception solution
- Assisted the development of the perception toolkit

Beijing, China

May 2017 - May 2018

Service

Reviewer EMNLP 2019, WWW 2020, FCS, TNNLS

Review Assistant IJCAI 2019

Honors & Awards

2019	Special-Class Scholarship (Top 10 undergraduates per year) The highest honor for undergraduates at Tsinghua	Tsinghua University
2019	Cai Xiong Scholarship (Top 10 undergraduates per year) Awarded to students with excellent scientific potential	Tsinghua University
2019	Fellowship of the Initiative Scientific Research Program (10 undergraduates per year) Supported students who have excellent research potential and projects (US\$ 32,000 research funding)	Tsinghua University
2019	Overall Excellence Scholarship Awarded to students with excellent achievements	Tsinghua University
2018	Academic Excellence Scholarship Awarded to students with excellent academic achievements	Tsinghua University
2017	Social Work Excellence Scholarship Awarded to students with excellent achievements in social work	Tsinghua University
2015	2nd Prize, National Olympiad in Informatics Nation-wide contest on algorithm design and implementation	China Computer Federation