

Manling Li

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Research Interest

My research probes the intersection of Natural Language Processing (NLP) and Computer Vision (CV). I empower machines to obtain a unified event graph structured representation from multimedia data: (1) **Multimedia Knowledge Extraction**: How can machines automatically discover structured event knowledge jointly from text and vision? (2) **Knowledge Reasoning**: How can machines perform reasoning under the global context of event knowledge graph from historical events, such as event prediction? (3) **Knowledge Driven Applications**: How can machines leverage structured event knowledge in applications, such as timeline generation, meeting summarization, multimedia QA?

Education

University of Illinois at Urbana-Champaign

2022 (expected)

- Ph.D. in Computer Science. Advisor: Prof. Heng Ji
- Thesis Committee: Shih-Fu Chang, Kyunghyun Cho, Jiawei Han, Chengxiang Zhai
- Thesis Title: Multimedia Structural Event Knowledge Acquisition

Chinese Academy of Sciences, Institute of Computing Technology

2018

- M.S. in Computer Science and Technology. Advisor: Prof. Yuanzhuo Wang

University of Science and Technology Beijing

2015

- B.E. in Computer Science (Internet of Things), B.M. in Information Management and Information Systems (minor)

Experience

Microsoft Research, Cognitive Services Research group, Redmond, WA, USA

05/2021 - 08/2021

Mentor: Ruochen Xu. Co-mentor: Shuohang Wang, Luowei Zhou, Chenguang Zhu

- Topic: Vision-Language Pretraining with Event Knowledge

IBM Research, Foundations of AI Reasoning group, Yorktown Heights, NY, USA

06/2020 - 08/2020

Mentor: Tengfei Ma, Mo Yu. Co-mentor: Lingfei Wu, Tian Gao

- Topic: Graph Compression via Optimal Transport for Timeline Summarization

Selected Project

DARPA AIDA: Active Interpretation of Disparate Alternatives

2018 - Present

- Topic: Multimedia Knowledge Extraction, including extraction of entities, relations, events, argument roles
- Lead to build open-source multimedia knowledge extraction system GAIA, awarded **ACL 2020 Best Demo Paper**
- **Ranked 1st** in NIST Streaming Multimedia Knowledge Base Population (SM-KBP) evaluation in both 2019 and 2020
- Transferred the dockerized system to **DARPA and ARL** to support intelligent analysis

DARPA KAIROS: Knowledge-directed Artificial Intelligence Reasoning Over Schemas

2019 - Present

- Topic: Event Schema Induction via Temporal Event Graph Modeling, Schema-guided Event Prediction
- Lead to generate schema library in 2020 DARPA KAIROS Phase I evaluation

COVID-KG: COVID-19 Literature Knowledge Graph Construction

2020 - 2020

- Topic: Scientific Information Extraction, containing interactions among genes, diseases, symptoms, chemicals
- Awarded **NAACL 2021 Best Demo Paper**; The KG has been downloaded more than 1000 times

ARL Network Science Collaborative Technology Alliance (NS-CTA)

2018 - 2020

- Topic: Event Knowledge Extraction and Reasoning, including event spatial-temporal tracking and event QA
- Our event tracking system has been transferred to **ARL**, and was selected to present at the 2019 ARL Demo Day.

- Topic: Multimodal Meeting Summarization; Invited talk at industrial research labs, such as Intel MDI Research, etc.

Honor

Selected Awards

- **ACL 2020 Best Demo Paper Award** [23]
- **NAACL 2021 Best Demo Paper Award** [28]
- **Microsoft Research PhD Fellowship**
- Mavis Future Faculty Fellow
- C.L. and Jane Liu Award
- Beijing Outstanding Undergraduate Award
- Academic Excellence Awards (6 out of more than 10,000 students in University of Science and Technology Beijing)
- National Scholarship
- Chinese Academy of Sciences First Class Scholarship
- Schlumberger Master Fellowship

Selected Academic Competitions and Evaluations

- Ranked 1st in TAC Streaming Multimedia Knowledge Base Population (SM-KBP) 2019, with more than 10% absolute gains compared the second ranked team
- Ranked 1st in TAC Streaming Multimedia Knowledge Base Population (SM-KBP) 2020
- 1st prize in National Computer Chess Tournament (Connect Six)
- 1st prize in National Software Innovation Competition
- 2nd prize in National Computer Design Competition
- 2nd Prize in National Computer Chess Tournament (Nogo)
- 2nd prize in Student Research Training Program of China

Publication

36. **CLIP-Event: Connecting Vision and Text with Event Structures**
Manling Li, Ruochen Xu, Shuohang Wang, Xudong Lin, Chenguang Zhu, Xuedong Huang, Heng Ji, Shih-Fu Chang
Under review
35. **Hierarchical Event Graph Schema Induction with Episode Discovery**
Sha Li, Zhenhailong Wang, *Manling Li*, Kyunghyun Cho, Heng Ji, Jiawei Han
Under review
34. **MuMuQA: Multimedia Multi-Hop News Question Answering via Knowledge Extraction and Grounding**
Revanth Reddy, Xilin Rui, *Manling Li*, Xudong Li, Haoyang Wen, Jaemin Cho, Lifu Huang, Mohit Bansal, Avi Sil, Shih-Fu Chang, Alexander Schiwing and Heng Ji
AAAI 2022
33. **New Frontiers of Information Extraction**
Muhao Chen, Lifu Huang, *Manling Li*, Ben Zhou, Heng Ji, and Dan Roth
NAACL 2022 Tutorial
32. **Timeline Summarization based on Event Graph Compression via Time-Aware Optimal Transport**
Manling Li, Tengfei Ma, Mo Yu, Lingfei Wu, Tian Guo, Heng Ji, Kathleen McKeown
EMNLP 2021
31. **The Future is not One-dimensional: Complex Event Schema Induction via Graph Modeling**
Manling Li, Sha Li, Zhenhailong Wang, Lifu Huang, Kyunghyun Cho, Heng Ji and Jiawei Han
EMNLP 2021
30. **Joint Multimedia Event Extraction from Video and Article**
Brian Chen, Xudong Lin, Christopher Thomas, *Manling Li*, Shoya Yoshida, Lovish Chum, Heng Ji and Shih-Fu Chang
EMNLP 2021 Findings

29. **Event-centric Natural Language Processing**
Muhao Chen, Hongming Zhang, Qiang Ning, **Manling Li**, Heng Ji, Dan Roth and Kathleen McKeown
ACL 2021 Tutorial
28. **COVID-19 Literature Knowledge Graph Construction and Drug Repurposing Report Generation**
Qingyun Wang, **Manling Li**, Xuan Wang, Nikolaus Parulian, Guangxing Han, Jiawei Ma, Jingxuan Tu, Ying Lin, etc
[NAACL 2021 Best Demo Paper](#)
27. **RESIN: A Dockerized Schema-Guided Cross-document Cross-lingual Cross-media Information Extraction and Event Tracking System**
Haoyang Wen, Ying Lin, Tuan Lai, Xiaoman Pan, Sha Li, Xudong Lin, Ben Zhou, **Manling Li**, Haoyu Wang, Hongming Zhang, Xiaodong Yu, Alexander Dong, Zhenhailong Wang, Yi Fung, Piyush Mishra, Qing Lyu, Dídac Surís, Brian Chen, Susan W Brown, Martha Palmer, Chris Callison-Burch, Carl Vondrick, Jiawei Han, Dan Roth, Shih-Fu Chang and Heng Ji
NAACL 2021 Demo
26. **GENE: Global Event Network Embedding**
Qi Zeng, **Manling Li**, Tuan Lai, Heng Ji, Mohit Bansal and Hanghang Tong
TextGraphs@NAACL2021
25. **Event-centric Natural Language Understanding**
Muhao Chen, Hongming Zhang, Qiang Ning, **Manling Li**, Heng Ji and Dan Roth
AAAI 2021 Tutorial
24. **Connecting the Dots: Event Graph Schema Induction with Path Language Modeling**
Manling Li, Qi Zeng, Ying Lin, Kyunghyun Cho, Heng Ji, Jonathan May, Nathanael Chambers, Clare Voss
EMNLP 2020
23. **GAIA: A Fine-grained Multimedia Knowledge Extraction System**
Manling Li*, Alireza Zareian*, Ying Lin, Xiaoman Pan, Spencer Whitehead, Brian Chen, Bo Wu, Heng Ji, Shih-Fu Chang, Clare R Voss, Dan Napieriski, Marjorie Freedman
[ACL 2020 Best Demo Paper](#)
22. **Cross-media Structured Common Space for Multimedia Event Extraction**
Manling Li*, Alireza Zareian*, Qi Zeng, Spencer Whitehead, Di Lu, Heng Ji, Shih-Fu Chang
ACL 2020
21. **GAIA at SM-KBP 2020 - A Dockerized Multi-media Multi-lingual Knowledge Extraction, Clustering, Temporal Tracking and Hypothesis Generation System**
Manling Li, Ying Lin, Tuan Manh Lai, Xiaoman Pan, Haoyang Wen, Sha Li, Zhenhailong Wang, Pengfei Yu, etc
NIST TAC-KBP 2020
20. **UIUC TAC2020 RUFES System Description**
Revanth Gangi Reddy, **Manling Li**, Haoyang Wen and Heng Ji
NIST TAC-KBP 2020
19. **Keep Meeting Summaries on Topic: Abstractive Multi-Modal Meeting Summarization**
Manling Li, Lingyu Zhang, Heng Ji, Rich Radke
ACL 2019
18. **Multilingual Entity, Relation, Event and Human Value Extraction**
Manling Li, Ying Lin, Joe Hoover, Spencer Whitehead, Clare R Voss, Morteza Dehghani, Heng Ji
NAACL 2019 Demo
17. **GAIA at SM-KBP 2019 - A Multi-media Multi-lingual Fine-Grained Knowledge Extraction and Hypothesis Generation System**
Manling Li, Ying Lin, Ananya Subburathinam, Spencer Whitehead, Xiaoman Pan, Di Lu, Qingyun Wang, etc
NIST TAC-KBP 2019
16. **A Baseline Fine-Grained Entity Extraction System for TAC-KBP2019**
Ying Lin, Xiaoman Pan, **Manling Li**, Heng Ji, etc
NIST TAC-KBP 2019
15. **The Unobtrusive Group Interaction (UGI) Corpus**
Indrani Bhattacharya, Michael Foley, Ni, Tongtao Zhang, Christine Ku, Cameron Mine, **Manling Li**, Heng Ji, etc

ACM MMSys 2019

14. **GAIA - A Multi-media Multi-lingual Knowledge Extraction and Hypothesis Generation System**
Tongtao Zhang, Ananya Subburathinam, Ge Shi, Lifu Huang, Di Lu, Xiaoman Pan, **Manling Li**, Boliang Zhang, Qingyun Wang, Spencer Whitehead, Heng Ji, etc
NIST TAC-KBP 2018
13. **Hierarchical Types Constrained Topic Entity Detection for Knowledge Base Question Answering**
Yunqi Qiu, **Manling Li**, Yuanzhuo Wang, Yantao Jia.
WWW 2018 (abstract)
12. **Path-Based Attention Neural Model for Fine-Grained Entity Typing**
Denghui Zhang, **Manling Li**, Pengshan Cai, Yantao Jia, Yuanzhuo Wang
AAAI 2018 (abstract)
11. **Link Prediction in Knowledge Graphs: A Hierarchy-Constrained Approach**
Manling Li, Yuanzhuo Wang, Denghui Zhang, Yantao Jia, Xueqi Cheng
IEEE Transactions on Big Data
10. **Efficient Parallel Translating Embedding For Knowledge Graphs**
Denghui Zhang, **Manling Li**, Yantao Jia, Yuanzhuo Wang, Xueqi Cheng
The IEEE/WIC/ACM International Conference on Web Intelligence 2017
9. **OpenKN at TAC KBP 2016**
Manling Li, Xinlei Chen, Yantao Jia, Yuanzhuo Wang, etc
NIST TAC-KBP 2016
8. **Hierarchy-Based Link Prediction in Knowledge Graphs**
Manling Li, Yantao Jia, Yuanzhuo Wang, Jingyuan Li, Xueqi Cheng
WWW 2016 (abstract)
7. **Predicting Links and Their Building Time: A Path-Based Method**
Manling Li, Yantao Jia, Yuanzhuo Wang, Zeya Zhao, Xueqi Cheng
AAAI 2016 (abstract)

Patents

6. **An Ontology Alignment Algorithm Based on Knowledge Graph Embedding**
1st student author. No.CN108694201A
5. **A Relation Inference System Based on Knowledge Graph Embedding**
1st student author. No.CN106909622A
4. **A Tag Inference System Based on Knowledge Graph Embedding**
2nd student author. No.CN107391577A
3. **An Attribute Extraction Method for Web Pages**
2nd student author. No.CN104636466A
2. **A Fine-Grained Classification Method for Knowledge Base**
2nd student author. No.CN104615687B
1. **Knowledge Graph Compression**
1st author. No.P202007467US01

Invited Talk

Tutorials

9. **New Frontiers of Information Extraction**
Tutorial at NAACL 2022. May, 2022.
8. **Event-centric Natural Language Processing**
Tutorial at ACL 2020. Aug 2021.
7. **Event-centric Natural Language Understanding**
Tutorial at AAAI 2021. Feb, 2021.

Invited Talks

6. **Comprehensive Event Understanding in Multimedia Data**
USC ISI. Dec 2021.
5. **Structural Event Knowledge Acquisition from Multimedia Data**
UIUC NLP Seminar. Nov 2021.
4. **Event Extraction and Reasoning in Multimedia News Data**
Microsoft Research. Nov 2021.
3. **Visual Event Understanding with Contrastive Image-Language Pretraining**
Microsoft Research. Aug 2021.
2. **Fine-Grained Knowledge Extraction System from Multimedia Data**
ai.science. Oct 2020.
1. **Event Understanding and Narration for Multimedia Data**
Intel MDI Research Lab. May 2020.

Professional Service

Senior Program Committee

- International Joint Conference on Artificial Intelligence (IJCAI), 2021

Program Committee

- Association for Computational Linguistics (ACL) Rolling Review, 2021
- Annual Meeting of the Association for Computational Linguistics (ACL), 2021
- Conference on Empirical Methods in Natural Language Processing (EMNLP), 2021
- Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-HLT), 2021
- AAAI Conference on Artificial Intelligence (AAAI), 2021-2022
- The Web Conference (WWW), 2021-2022
- Conference on Automated Knowledge Base Construction (AKBC), 2021
- Conference of the European Chapter of the Association for Computational Linguistics (EACL), 2021
- Document Intelligence workshop at ACM SIGKDD Conference (KDD DI Workshop), 2021
- International Conference on Natural Language Processing and Chinese Computing (NLPCC) 2021
- International Conference on Computational Linguistics (COLING), 2020
- Conference on Asia-Pacific Chapter of the Association for Computational Linguistics (AACL), 2020
- China National Conference on Computational Linguistics (CCL), 2020

Journal Reviewer

- IEEE MultiMedia
- Journal of Artificial Intelligence Research
- Journal of Advances in Information Technology

Community Service

- Advising Assistant, UIUC PhD Orientation Seminar, 2021
- Graduate Student Representative, UIUC CS PhD Visit Day, 2020
- Co-Chair, Source Technology Association in University of Science and Technology Beijing, 2014
- Volunteer, the 22nd APEC (Asia-Pacific Economic Cooperation) Economic Leaders' Meeting, 2014

Teaching and Mentoring Experience

Teaching Assistant

- CS 598 Knowledge-driven Natural Language Generation, Spring 2022

Guest Lecturer

- Multimedia Encoding via Vision-Language Pretraining
CS 546 Advanced Topics in Natural Language Processing, Fall 2021

Advising Assistant

- CS 591 PhD Orientation Seminar, Fall 2021

Mentoring Students

- **Xilin Rui**, 2020-2021
Undergraduate at Tsinghua University
published her first paper on multimedia question answering at AAAI 2022
- **Zhenhailong Wang**, 2020-2021
Master in CS at University of Illinois Urbana-Champaign
published his first paper on schema induction at EMNLP 2021
- **Revanth Gangi Reddy**, 2020-2021
Master in CS at University of Illinois Urbana-Champaign
published a first-author paper on multimedia question answering at AAAI 2022
- **Shengyu Feng**, 2021
Master in CS at University of Illinois Urbana-Champaign
published his first NLP paper on event coreference at CRAC workshop at EMNLP 2022
- **Zhiying Zhu**, 2021
Undergraduate at Zhejiang University
co-advised with Prof Yixin Cao from Singapore Management University, worked on visual prompt engineering
- **Emma Hamel**, 2020
Undergraduate at University of Illinois Urbana-Champaign
worked on chemical schema induction
- **Shuo Gong**, 2019
Undergraduate at University of Illinois Urbana-Champaign
worked on sub-event hierarchy construction

Open-Source Systems

- **GAIA: A Fine-grained Multimedia Knowledge Extraction System** [Code]
Entity, relation, event extraction with coreference for multilingual (English, Spanish, and Russian) multimedia corpus.
- **Cross-lingual Entity Discovery and Linking** [Code]
Entity extraction and coreference for English, Spanish, and Chinese.
- **Multilingual Entity, Relation, Event and Human Value Extraction** [Code]
Knowledge extraction system with human values for English, Russian, and Ukrainian.
- **RESIN: Schema-Guided Cross-document Cross-lingual Cross-media Event Extraction and Tracking** [Code]
Schema-Guided cross-document information extraction and tracking system.

Media Coverage

- **Manling Li Produces Award-Winning Event Schema Research with Adviser and Mentor Heng Ji**
CS @ Illinois News
- **Meet Microsoft Research 2021 Global PhD Fellowship Recipients**
Microsoft Research
- **Shuangtong Wu won Best Paper Award, Manling Li won Best Demo Paper Award at ACL 2020**
AI Era

Reference

- **Heng Ji** (doctoral advisor)
Professor
Computer Science Department, University of Illinois at Urbana-Champaign
hengji@illinois.edu
- **Shih-Fu Chang**
Richard Dicker Professor
Electrical Engineering Department and Computer Science Department, Columbia University
Senior Executive Vice Dean, School of Engineering and Applied Science, Columbia University
sc250@columbia.edu
- **Kyunghyun Cho**
Associate Professor
Department of Computer Science and Center for Data Science, New York University
CIFAR Fellow, Learning in Machines and Brains
Co-Founder and Senior Director, Frontier Research
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- **Jiawei Han**
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Department of Computer Science, University of Illinois at Urbana-Champaign
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- **Kathleen McKeown**
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Department of Computer Science, Columbia University
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