

# Muhao Chen

Assistant Professor (Research) of Computer Science, USC.

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## Research Interests

*Natural Language Understanding and Knowledge Acquisition. Computational Biology and Medicine.*

## EDUCATION AND ACADEMIC EXPERIENCE

### University of Southern California

2021-date

- **Assistant Professor (Research)**, Department of Computer Science
- **Director**, Language Understanding and Knowledge Acquisition Group

### University of Pennsylvania, Philadelphia, PA

2019-2020

- **Postdoctoral Fellow**, Hosted by Dan Roth, Eduardo D. Glandt Distinguished Professor of Computer and Information Science

### University of California, Los Angeles, USA

*Ph.D., Department of Computer Science*

2014-2019

*Dissertation: Multi-relational Representation Learning and Knowledge Acquisition*

*Advisor: Carlo Zaniolo, Distinguished Professor of Computer Science, N.E. Friedmann Chair in Knowledge Science*

*Collaborators:*

- Kai-Wei Chang, Assistant Professor of Computer Science
- Wei Wang, Leonard Kleinrock Chair Professor of Computer Science
- Yizhou Sun, Associate Professor of Computer Science
- Alex Bui, Professor of Radiological Sciences

### Fudan University, Shanghai, China

*B.S. in Computer Science. Advisor: X. Sean Wang, Dorothean Chair Professor of Computer Science*

2010-2014

## PUBLICATIONS

\*Indicating equal contributions. ✉Indicating contact authors of journal publications.

### Tutorials

1. **Muhao Chen**, Lifu Huang, Manling Li, Ben Zhou, Heng Ji, Dan Roth. New Frontiers of Information Extraction. In **NAACL**, 2022.
2. **Muhao Chen**, Hongming Zhang, Qiang Ning, Manling Li, Heng Ji, Kathleen McKeown, Dan Roth. Event-centric Natural Language Processing. In **ACL**, 2021.
3. **Muhao Chen**, Hongming Zhang, Qiang Ning, Manling Li, Heng Ji, Dan Roth. Event-centric Natural Language Understanding. In **AAAI**, 2021.
4. Jay Pujara, Pedro Szekely, Huan Sun, **Muhao Chen**. From Tables to Knowledge: Recent Advances in Table Understanding. In **KDD**, 2021.
5. **Muhao Chen**, Kai-Wei Chang, Dan Roth. Recent Advances in Transferable Representation Learning. In **AAAI**, 2020.

### Refereed Publication in Conference Proceedings

6. Peifeng Wang, Jonathan Zamora, Junfeng Liu, Filip Ilievski, Muhao Chen, Xiang Ren. Contextualized Scene Imagination for Generative Commonsense Reasoning. In the 10<sup>th</sup> International Conference on Learning Representations (**ICLR**), 2022.
7. Wenxuan Zhou, Fangyu Liu, **Muhao Chen**. Contrastive Out-of-Distribution Detection for Pretrained Transformers. In Proceedings of the 36th Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2021.
8. Wenxuan Zhou, **Muhao Chen**. Learning from Noisy Labels for Entity-Centric Information Extraction. In Proceedings of the 36th Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2021.
9. Haoyu Wang, Hongming Zhang, **Muhao Chen**, Dan Roth. Learning Constraints and Descriptive Segmentation for Subevent Detection. In Proceedings of the 36th Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2021.

10. Xiyang Zhang, **Muhao Chen**, Jonathan May. Saliency-Aware Event Chain Modeling for Narrative Understanding. In Proceedings of the 36th Conference on Empirical Methods in Natural Language Processing (**EMNLP**), 2021.
11. Fei Wang, Kexuan Sun, Jay Pujara, Pedro Szekely, **Muhao Chen**. Table-based Fact Verification With Saliency-aware Learning. In Proceedings of the 36th Conference on Empirical Methods in Natural Language Processing (**EMNLP**) - Findings, 2021.
12. Mingyu Ma, **Muhao Chen**, Te-lin Wu, Nanyun Peng. HyperExpan: Taxonomy Expansion with Hyperbolic Representation Learning. In Proceedings of the 36th Conference on Empirical Methods in Natural Language Processing (**EMNLP**) - Findings, 2021.
13. Fangyu Liu, **Muhao Chen**, Dan Roth, Nigel Collier. Visual Pivoting for (Unsupervised) Entity Alignment. In *the 35<sup>th</sup> AAAI Conference on Artificial Intelligence (AAAI)*, 2021.
14. Cunchao Zhu, **Muhao Chen**, Changjun Fan, Guangquan Cheng, Yan Zhang. Learning from History: Modeling Temporal Knowledge Graphs with Sequential Copy-Generator Networks. In *the 35<sup>th</sup> AAAI Conference on Artificial Intelligence (AAAI)*, 2021.
15. Zequn Sun, **Muhao Chen**, Wei Hu. Knowing the No-match: Entity Alignment with Dangling Cases. In *Proceedings of the 59<sup>th</sup> Annual Meeting of the Association for Computational Linguistics (ACL)*, 2021.
16. Peifeng Wang, Filip Ilievski, Muhao Chen, Xiang Ren. Do Language Models Perform Generalizable Commonsense Inference? In *Proceedings of the 59<sup>th</sup> Annual Meeting of the Association for Computational Linguistics (ACL) - Findings*, 2021.
17. **Muhao Chen**, Weijia Shi, Ben Zhou, Dan Roth. Cross-lingual Entity Alignment with Incidental Supervision. In *the 16<sup>th</sup> Conference of the European Chapter of the Association for Computational Linguistics (EACL)*, 2021.
18. Xuelu Chen\*, Michael Boratko\*, **Muhao Chen**, Shib Sankar Dasgupta, Xiang Li, Andrew McCallum. Probabilistic Box Embeddings for Uncertain Knowledge Graph Reasoning. In *the 19<sup>th</sup> Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2021.
19. Fei Wang, Kexuan Sun, **Muhao Chen**, Jay Pujara, Pedro Szekely. Retrieving Complex Tables with Multi-Granular Graph Representation Learning. In *Proceedings of the 44<sup>th</sup> ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2021.
20. Minh Pham, Craig Knoblock, **Muhao Chen**, Binh Vu, Jay Pujara. SPADE: A Semi-supervised Probabilistic Approach for Detecting Errors in Tables. In *Proceedings of the 30<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI)*, 2021.
21. Kexuan Sun, Fei Wang, **Muhao Chen**, Jay Pujara. Tabular Functional Block Detection with Embedding-based Agglomerative Cell Clustering. In *Proceedings of the 30<sup>th</sup> ACM International Conference on Information and Knowledge Management (CIKM)*, 2021.
22. **Muhao Chen**, Hongming Zhang, Haoyu Wang, Dan Roth. “What Are You Trying to Do?” Semantic Typing of Event Processes. In *Proceedings of the 24<sup>th</sup> SIGNLL Conference on Computational Natural Language Learning (CoNLL)*, 2020. **Best Paper Nomination**
23. Zequn Sun, **Muhao Chen**, Wei Hu, Chengming Wang. Knowledge Association with Hyperbolic Representation Learning of Knowledge Graphs. In *Proceedings of the 25<sup>th</sup> Conference on Empirical Methods in Natural Language Processing (EMNLP)* 2020.
24. Haoyu Wang, **Muhao Chen**, Hongming Zhang, Dan Roth. Joint Constrained Learning for Event-Event Relation Extraction. In *Proceedings of the 25<sup>th</sup> Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2020.
25. Hongming Zhang, **Muhao Chen**, Haoyu Wang, Y. Song, Dan Roth. Analogous Process Structure Induction for Sub-event Sequence Prediction. In *Proceedings of the 25<sup>th</sup> Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2020.
26. Xuelu Chen, **Muhao Chen**, Changjun Fan, Ankith Uppunda, Yizhou Sun, Carlo Zaniolo. Multilingual Knowledge Graph Completion via Ensemble Knowledge Transfer. In *Proceedings of the 25<sup>th</sup> Conference on Empirical Methods in Natural Language Processing (EMNLP) - Findings*, 2020.
27. Zequn Sun, Chengming Wang, Wei Hu, **Muhao Chen**, Jian Dai, Wei Zhang, Yuzhong Qu. Knowledge Graph Alignment Network with Gated Multi-hop Neighborhood Aggregation. In *the 34<sup>th</sup> AAAI Conference on Artificial Intelligence (AAAI)*, 2020.
28. Changping Meng, **Muhao Chen**, Jie Mao, Jennifer Neville. ReadNet: A Hierarchical Transformer Framework for Readability Analysis. In *the 42<sup>nd</sup> European Conference on Information Retrieval (ECIR)*, 2020.
29. Junheng Hao, Chelsea J. T. Ju, **Muhao Chen**, Yizhou Sun, Carlo Zaniolo, Wei Wang. Bio-JOIE: Joint Representation Learning of Biological Knowledge Bases. In *the 11<sup>th</sup> ACM Conference on Bioinform., Comput. Bio. and Biomed. (ACM BCB)*, 2020 (**Best Student Paper Award**, ~0.8%)

30. Tianran Zhang, **Muhao Chen**, Alex Bui. Diagnostic Prediction with Sequence-of-sets Representation Learning for Clinical Events. In *Proceedings of the 18<sup>th</sup> International Conference on Artificial Intelligence in Medicine (AIME)*, 2020
31. **Muhao Chen**, Yingtao Tian, Haochen Chen, Kai-Wei Chang, Steve Skiena, Carlo Zaniolo. Learning to Represent Bilingual Dictionaries. In *Proceedings of the 23rd SIGNLL Conference on Computational Natural Language Learning (CoNLL)*, 2019
32. Junheng Hao, **Muhao Chen**, Wenchao Yu, Yizhou Sun, Wei Wang. Universal Representation Learning of Knowledge Bases by Jointly Embedding Ontological Concepts and Instances. In *Proceedings of the 25<sup>th</sup> ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2019.
33. Xuelu Chen, **Muhao Chen**, Weijia Shi, Yizhou Sun, Carlo Zaniolo. Uncertain Knowledge Graphs Embeddings. In *the 33<sup>rd</sup> International Conference on Artificial Intelligence (AAAI)*, 2019.
34. **Muhao Chen**<sup>\*</sup>, Weijia Shi<sup>\*</sup>, Pei Zhou, Kai-Wei Chang. Retrofitting Contextualized Word Embeddings with Paraphrases. In *Proceedings of the 24th Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2019.
35. Pei Zhou, Weijia Shi, Jieyu Zhao, Kuan-Hao Huang, **Muhao Chen**, Ryan Cotterell, Kai-Wei Chang. Examining Gender Bias in Languages with Grammatical Gender. In *Proceedings of the 24th Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2019.
36. **Muhao Chen**, Chris Quirk. Embedding Edge-attributed Relational Hierarchies. In *Proceedings of the 42<sup>nd</sup> ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2019.
37. Qingheng Zhang, Zequn Sun, Wei Hu, **Muhao Chen**, Lingbing Guo, Yuzhong Qu. Multi-view Knowledge Graph Embedding for Entity Alignment. In *Proceedings of the 28<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI)*, 2019. Also in **ISWC 2020** Invited Sister Conference Track.
38. Zequn Sun, Jiacheng Huang, Wei Hu, **Muhao Chen**, Yuzhong Qu. TransEdge: Translating Relation-contextualized Embeddings for Knowledge Graphs. In *the 18<sup>th</sup> International Semantic Web Conference (ISWC)*, 2019.
39. Haochen Chen, Syed Fahad Sultan, Yingtao Tian, **Muhao Chen**, Steven Skiena. Fast and Accurate Network Embeddings via Very Sparse Random Projection. In *Proceedings of the 28<sup>th</sup> ACM International Conference on Information and Knowledge Management (CIKM)*, 2019.
40. Changjun Fan, Yuhui Ding, Li Zeng, **Muhao Chen**, Yizhou Sun and Zhong Liu. Learning to Identify High Betweenness Centrality Nodes from Scratch: A Novel Graph Neural Network Approach. In *Proceedings of the 28<sup>th</sup> ACM International Conference on Information and Knowledge Management (CIKM)*, 2019.
41. **Muhao Chen**, Changping Meng, Gang Huang, Carlo Zaniolo. Learning to Differentiate Between Main-articles and Sub-articles in Wikipedia. In *IEEE International Conference on Big Data (BigData)*, 2019.
42. Yingtao Tian, Haochen Chen, Bryan Perozzi, **Muhao Chen**, Xiaofei Sun, Steven Skiena. Social Relation Inference via Label Propagation. In *the 41<sup>st</sup> European Conference on Information Retrieval (ECIR)*, 2019.
43. Qi Zhao, **Muhao Chen**, Pengyuan Du, Tuan Le, Mario Gerla. Towards Efficient Cellular Traffic Offloading via Dynamic MPTCP Path Configuration with SDN. In *IEEE International Conference on Computing, Networking and Communications (ICNC)*, 2019.
44. **Muhao Chen**, Gang Huang, Changping Meng, Carlo Zaniolo. Neural Article Pair Modeling for Wikipedia Sub-article Matching. In *the 29<sup>th</sup> European Conference on Machine Learning (ECML)*, 2018 (**Plenary Presentation**, ~1.7% acceptance rate)
45. **Muhao Chen**, Yingtao Tian, Kai-Wei Chang, Steven Skiena, Carlo Zaniolo. Co-training Embeddings of Knowledge Graphs and Entity Descriptions for Cross-lingual Entity Alignment. In *the 27<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI)*, 2018.
46. **Muhao Chen**, Yingtao Tian, Xuelu Chen, Zijun Xue, Carlo Zaniolo. On2Vec: Embedding-based Relation Prediction for Ontology Population. In *Proceedings of the 17<sup>th</sup> SIAM International Conference on Data Mining (SDM)*. SIAM, 2018
47. Haochen Chen, Xiaofei Sun, Yingtao Tian, Bryan Perozzi, **Muhao Chen** and Steven Skiena. Enhanced Network Embeddings via Exploiting Edge Labels. In *the 27th ACM Conference on Information and Knowledge Management (CIKM)*. ACM 2018.
48. Pengyuan Du, Seunghyun Yoo, Qi Zhao, **Muhao Chen**, Mario Gerla. Towards Opportunistic Resource Sharing in Mobile Social Networks - an Evolutionary Game Theoretic Approach. In *Proceedings of the 19th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, ACM 2018.
49. **Muhao Chen**, Qi Zhao, Pengyuan Du, Carlo Zaniolo, Mario Gerla. Demand-driven Cache Allocation Based on Context-aware Collaborative Filtering. In *Proceedings of the 19th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, ACM 2018.

50. **Muhao Chen**, Yingtao Tian, Mohan Yang, Carlo Zaniolo. Multilingual Knowledge Graph Embeddings for Cross-lingual Knowledge Alignment. In *Proceedings of the 26<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI)*. 2017.
51. **Muhao Chen**, Carlo Zaniolo. Learning Multi-faceted Knowledge Graph Embeddings for Natural Language Processing. In *Proceedings of the 26<sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI)*. 2017 (Extended abstract)
52. **Muhao Chen**, Shi Gao, X. Sean Wang. Converting Spatiotemporal Data Among Heterogeneous Granularity Systems. In *Proceedings of the 25<sup>th</sup> IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*. IEEE, 2016. Shorter version in *Proceedings of the 31<sup>st</sup> ACM SIGAPP Symposium on Applied Computing (SAC)*. ACM, 2016.

### Refereed Journal Publication and Book Chapters

53. Bangzheng Li, Wenpeng Yin, **Muhao Chen**<sup>✉</sup>. Ultra-fine Entity Typing with Indirect Supervision from Natural Language Inference. *Transactions of the Association for Computational Linguistics (TACL)*, 2022.
54. Mohammad Rostami, Hangfeng He, **Muhao Chen**, Dan Roth. Invariant Representation Learning for Transferring Knowledge. *Federated and Transfer Learning*. Springer, 2022 (Book Chapter)
55. Jyun-Yu Jiang, Chelsea J.-T. Ju, Junheng Hao, **Muhao Chen**, Wei Wang<sup>✉</sup>. Circular RNA Prediction based on Junction Encoders and Deep Interaction among Splice Sites. *Bioinformatics*, vol. 37. Oxford University Press, 2021. Proceedings of **ISMB/ECCB**, 2021.
56. Guangyu Zhou\*, **Muhao Chen**<sup>✉\*</sup>, Chelsea J. T. Ju\*, Zheng Wang, Jyun-Yu Jiang, Wei Wang<sup>✉</sup>. Mutation effect estimation on protein-protein interactions using deep contextualized representation learning. *NAR Genom. Bioinform*, vol. 2 (2). Oxford University Press. 2020.
57. Zequn Sun, Qingheng Zhang, Wei Hu<sup>✉</sup>, Chengming Wang, **Muhao Chen**, Chengkai Li, Yuzhong Qu. A Benchmarking Study of Embedding-based Entity Alignment for Knowledge Graphs. *Proceedings of the VLDB Endowment (PVLDB)*, vol. 13. ACM. 2020
58. **Muhao Chen**<sup>✉\*</sup>, Chelsea J. T. Ju\*, Guangyu Zhou, Tianran Zhang, Kai-Wei Chang, Carlo Zaniolo, Wei Wang. Multifaceted Protein-Protein Interaction Prediction Based on Siamese Residual RCNN. *Bioinformatics*, vol. 35 (14) Oxford University Press. Proceedings of **ISMB/ECCB**, 2019.
59. Carlo Zaniolo<sup>✉</sup>, Shi Gao, Maurizio Atzori, **Muhao Chen**, Jiaqi Gu. User-Friendly Temporal Queries on Historical Knowledge Bases. *Information and Computation*, Vol. 259 (3). Elsevier, 2018.

### Refereed Workshop and System Demonstration Papers

60. Weijia Shi, **Muhao Chen**, Yingtao Tian, Kai-Wei Chang. Learning Bilingual Word Embeddings Using Lexical Definitions. In *Proceedings of ACL Workshop on Representation Learning for NLP (RepL4NLP)*, 2019.
61. Zhubo Deng, Pei Zhou, Weijia Shi, **Muhao Chen**, Kai-Wei Chang. Computational Analysis of French-origin Reborrowing Process for English Loanwords. In *ICDM Workshop on Multilingual Cognitive Services (ICDMW)*, 2019
62. Changjun Fan, Yizhou Sun, Li Zeng, Yang-Yu Liu, **Muhao Chen**, Zhong Liu. Dismantle Large Networks through Deep Reinforcement Learning. In *ICLR Workshops*, 2019.
63. Pei Zhou, **Muhao Chen**, Kai-Wei Chang, Carlo Zaniolo. Quantification and Analysis of Scientific Language Variation by Research Fields. In *Proceedings of the ICDM Workshops (ICDMW)*, 2018.
64. **Muhao Chen**, Tao Zhou, Pei Zhou, Carlo Zaniolo. Multi-graph Affinity Embeddings for Multilingual Knowledge Graphs. **Contributed talk** in the *6th Workshop on Automated Knowledge Base Construction at NIPS (AKBC)*. 2017.
65. Tao Zhou, **Muhao Chen**, Demetri Terzopoulos, Jie Yu. Attention-based Natural Language Person Retrieval. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*. IEEE, 2017.
66. Shi Gao, **Muhao Chen**, Maurizio Atzori, Carlo Zaniolo. SPARQL<sup>T</sup> and its User-Friendly Interface for Managing and Querying the History of Knowledge Bases. In *the 14<sup>th</sup> International Semantic Web Conference (ISWC)*, 2015 (demo).

## PRESENTATIONS

### Invited talks, colloquia and tutorials

1. Understanding Event Processes in Natural Language. *Invited talk, ML Seminar, Purdue University*. Sept 2021.
2. Understanding Event Processes in Natural Language. *Invited talk, Tencent AI Lab, Seattle*. Sept 2021.
3. Event-Centric Natural Language Processing. *Half-day Tutorial at ACL*. Aug, 2021.
4. From Tables to Knowledge: Recent Advances in Table Understanding. *Half-day Tutorial at KDD*. Aug, 2021.
5. Understanding Event Processes in Natural Language. *Invited talk, University of Central Florida*. Aug 2021.

6. Understanding Event Processes in Natural Language. *Invited talk, IBM Research Almaden*. July 2021.
7. Understanding Event Processes in Natural Language. *Invited talk, CS Department Seminar, Fudan University*. June 2021.
8. Understanding Event Processes in Natural Language. *Invited talk, CS Department Seminar, Nanjing University*. June 2021.
9. Understanding Event Processes in Natural Language. *Invited talk, NLP Seminar, National Univ. of Singapore*. May 2021.
10. Understanding Event Processes in Natural Language. *Invited talk, NLP Seminar, The Ohio State University*. May 2021
11. Understanding Event Processes in Natural Language. *Invited talk, CS Research Colloquium, UCSB*. April 2021
12. Understanding Event Processes in Natural Language. *Invited talk, Frontier Topics in Vision and Language, Arizona State University*. Mar 2021.
13. Understanding Event Processes in Natural Language. *Invited talk at Language Technology Seminar, University of Cambridge*. Nov 2020
14. Understanding Event Processes in Natural Language. *Invited talk at Machine Learning and Big Data Seminar, UCLA*. Nov 2020
15. Event-Centric Natural Language Understanding. *Half-day Tutorial at AAAI*. Feb, 2021.
16. Knowledge Acquisition with Transferable Representation Learning. *CS Research Colloquium, USC*. Nov 2020
17. Knowledge Acquisition with Transferable Representation Learning. *AI Seminar, USC ISI*. Los Angeles, Jan 2020.
18. Knowledge Acquisition with Transferable Representation Learning. *IBM Research Almaden*. San Jose, Jan 2020.
19. Knowledge Acquisition with Transferable Representation Learning. *Invited talk at FDSiF, Fudan Univ., Shanghai, China*. Dec 2019.
20. Knowledge Acquisition with Transferable Representation Learning. *Invited talk at SNAP Seminar, Stanford University*. Jan 2019.
21. Knowledge Acquisition with Transferable Representation Learning. *Machine Learning and Big Data Seminar, UCLA*. Jan 2019.
22. Event-Centric Commonsense Understanding. *CKG Lunch Talk, USC ISI*. Aug 2020
23. Recent Advances in Transferable Representation Learning. *Half-day tutorial at AAAI*. NYC, NY, Feb 2020.
24. Neural Article Pair Modeling for Wikipedia Sub-article Matching. *Google Search Intelligence Seminar Talk*. Sept 2017
25. Reasoning Across Multiple Spatiotemporal Granularity Systems. *Invited talk at Teradata Labs, El Segundo, CA, USA*. Mar 2015

### Conference talks

26. Cross-lingual Entity Alignment with Incidental Supervision. *Conference talk at EACL*. April 2021
27. “What Are You Trying To Do?” Semantic Typing of Event Processes. *Conference talk at CoNLL*. Nov 2020
28. Event Schema Instantiation as Knowledge Graph Alignment. *PI meeting (KAiROS), DARPA*. June 2020.
29. Retrofitting contextualized word embeddings with paraphrases. *Conference talk at EMNLP, Hong Kong, China*. Nov 2019
30. Cross-lingual Dependency Parsing with Unlabeled Auxiliary Languages. *Conference talk at CoNLL, Hong Kong, China*. Nov 2019
31. Neural Article Pair Modeling for Wikipedia Sub-article Matching. *Plenary talk at ECML, Dublin, Ireland*. Sept 2018
32. Co-training Embeddings of Knowledge Graphs and Entity Descriptions for Cross-lingual Entity Alignment. *Conference talk at IJCAI, Stockholm, Sweden*. July 2018
33. On2Vec: Embedding-based Relation Prediction for Ontology Population. *Conference talk at SDM, San Diego, CA, USA*. May 2018
34. Multilingual Knowledge Graph Embeddings for Cross-lingual Knowledge Alignment. *Contributed talk at AKBC, Longbeach, CA, USA*. Dec 2017
35. Multilingual Knowledge Graph Embeddings for Cross-lingual Knowledge Alignment. *Conference talk at IJCAI, Melbourne, Australia*. Aug 2017
36. Converting Spatiotemporal Data Among Heterogeneous Granularity Systems. *Conference talk at FUZZ-IEEE, Vancouver, Canada*. Aug 2016

## INDUSTRIAL EXPERIENCE

- |   |               |
|---|---------------|
| Microsoft Research, Redmond, WA (NLP Group)   | 2018.6-2018.9 |
| <ul style="list-style-type: none"><li>• <b>Research Intern</b>, <i>Embedding Edge-attributed Relational Hierarchies</i>. [36]</li></ul>                                   |               |
| Google, Mountain View, CA (Google Knowledge Graph)  | 2017.6~2017.9 |
| <ul style="list-style-type: none"><li>• <b>Research Intern</b>, <i>Neural Article Pair Modeling for Large-scale Sub-article Relation Extraction</i>. [44,41,28]</li></ul> |               |
| Google, Mountain View, CA (Procella Real-time Data Infrastructure)  | 2016.6~2016.9 |
| <ul style="list-style-type: none"><li>• <b>System SDE Intern</b>, <i>Dynamic Shard-partitioning for Large-scale Windowed Event Streams</i>.</li></ul>                     |               |
| Teradata Labs, Los Angeles, CA (Optimizer Group)  | 2015.6~2015.9 |
| <ul style="list-style-type: none"><li>• <b>R&amp;D Intern</b>, <i>Multi-task Learning for Cost-based Database Optimizers</i>.</li></ul>                                   |               |

## SELECTED AWARDS

NSF CRII Award. 2021-2023

ACM SIGBio Best Student Paper Award. 2020

UCLA Dissertation Fellowship. 2018-2019

Tung OOCL Scholarships. Tung's Foundation of Hong Kong & The Oriental Overseas Container Line. 2012, 2013

Wang-Dao Fellowship. President of Fudan University. 2013

Chun-Tsung Fellowship. Hui-Chun Chin and Tsung-Dao Lee Chinese Undergraduate Research Endowment. 2012

## TEACHING AND MENTORING

### Teaching

Instructor at USC

- CSCI 544: Applied Natural Language Processing (Graduate-level) Spring 2022

Teaching assistant (2015.9-2016.6), associate (2016.9-2017.6), fellow (2017.9-2018.6) at UCLA (Data Structures and Algorithms; Introduction to Computer Science).

### Current Students

James Y. Huang, PhD Student in Computer Science.	Fall 2021-date
Eric (Ehsan) Qasemi, PhD Student in Computer Science. (Co-advised with Pedro Szekely)	Fall 2020-date
Wenxuan Zhou, PhD Student in Computer Science.	Fall 2020-date
Fei Wang, MS Student in Computer Science. (Viterbi Honors Degree)	Fall 2020-date
Shikhar Singh, MS Student in Computer Science.	Fall 2021-date
Jiashu Xu, Undergraduate Student, Computer Science (CURVE Fellowship)	Fall 2021-date
Zhewei Xu, Undergraduate Student, Computer Science (CURVE Fellowship)	Fall 2021-date
Logan Norman, Undergraduate Student, Computer Science (Viterbi Fellowship)	Fall 2021-date
Mingtao Dong, Undergraduate Student, Computer Science (Provost's Research Fellowship)	Spring 2022-date

### Visiting Scholars/Students

Jihoon Sohn. USC PhD Student in Mathematics	Spring 2021-date
Bangzheng Li. UIUC, B.S. in Computer Science	Summer 2021-Spring 2022
Shanxiu He. Undergraduate, UCLA Computer Science (USC ISI NLP Intern, Co-hosted with Jon May)	Summer 2021
Piyush Khanna, Undergraduate, Delhi Tech Univ., Computer Science	Summer 2021
Yueguan Wang. Undergraduate, Tsinghua Univ., EE (USC-THU Summer Research Program)	Summer 2021

### Dissertation/Thesis Committee

Peifeng Wang, USC PhD Student in Computer Science. (Chair: Pedro Szekely)  
Michiel de Jong, USC PhD Student in Computer Science. (Chair: Leana Golubchik)  
Minh Pham, USC PhD Student in Computer Science. (Chair: Craig Knoblock)  
Kexuan Sun, USC PhD Student in Computer Science. (Chair: Jay Pujara)  
Xuelu (Shirley) Chen, UCLA PhD Student in Computer Science. (Chair: Carlo Zaniolo)



Chen, Muhao – CV (2/13/2022)

Tianran Zhang, UCLA PhD Student in Computer Science. (Chair: Alex Bui)

Jeong Hyun An, USC M.S. Student in Computer Science. (Chair)

### Mentoring

Haoyu Wang, UPenn MS Student in CIS (Now PhD student). <b>Research mentor</b>	Fall 2019-Fall 2021
Tianran Zhang, UCLA PhD student in Bioengineering. <b>Research mentor</b>	Fall 2019-Winter 2021
Junheng Hao, UCLA PhD student in Computer Science. <b>Research mentor</b>	Fall 2017-Fall 2019
Xuelu (Shirley) Chen, UCLA PhD student in Computer Science. <b>Research mentor</b>	Fall 2017-Winter 2020
Pei Zhou, UCLA undergraduate student (Now PhD student at USC CS). <b>Research mentor</b>	Winter 2017-Spring 2019
Weijia Shi, UCLA undergraduate student (Now PhD student at UW CSE). <b>Research mentor</b>	Summer 2018-Spring 2019
Ankith Uppunda. UCLA undergraduate student. <b>Research mentor.</b>	Spring 2019
Zhubo Deng, UCLA undergraduate student. <b>Research mentor</b>	Spring 2019
Xiaoshuang Wei, UCLA MS student in Computer Science (Now software engineer at Google). <b>Thesis mentor</b>	Spring 2017

## PROFESSIONAL SERVICE

### Panelist:

2021: NSF CISE Core Panel

### Organization Committee:

2022: AAAI (Senior PC), NAACL (Senior Area Chair – Information Extraction), NAACL SRW (Faculty Mentor).

2021: AAAI (Senior PC), IJCAI (Senior PC)

2019: IEEE AIKE (Doctoral Consortium Co-chair)

### PC Member:

2021: ACL, EACL, NAACL, WSDM, WWW.

2020: AAAI, AACL-IJCNLP, AKBC, COLING, EMNLP, IJCAI, ISWC, KDD, SIGIR, WSDM, \*SEM.

2019: AAAI, AKBC, NAACL, ACL, EMNLP-IJCNLP, BigData, NLPCC, WISE, ICSC.

2018: AAAI, EMNLP, BigData, NLPCC, SoCal NLP.

**Editorial Board:** Frontiers in Big Data

**Journal Reviewer:** TPAMI, TACL, TNNLS, Bioinformatics, PLOS Computational Biology, Briefings in Bioinformatics, Clinical and Translational Medicine, Comput. & Struct. Biotechnol., TKDD, TOIS, W3J, TKDE, TII, BMC Genomics, BMC Medical Genomics, BMC Human Genetics, Human Genomics, Quantitative Biology, GeoInformatica, Information Sciences.

## UNIVERSITY SERVICE

### University of Southern California

• USC ISI AI Seminar, <b>Organizer</b>	2021.7-date
• Department of Computer Science, <b>Faculty Hiring Committee</b>	2021
• Viterbi School of Engineering, <b>Fellowship Committee</b>	2021
• Department of Computer Science, <b>PhD Admission Fellowship Committee</b>	2021