

Xiang Ren

ASSISTANT PROFESSOR, COMPUTER SCIENCE DEPARTMENT, UNIVERSITY OF SOUTHERN CALIFORNIA
941 Bloom Walk SAL 216, Los Angeles, CA 90089 USA
☎ (217) 377-2966 | ✉ xiangren@usc.edu | 🏠 xren7.web.engr.illinois.edu

Research Interests

Machine learning, natural language processing, data mining.

My research focuses on developing automated and scalable techniques for extracting structured information from massive text data and applying structured knowledge to power intelligent services and life sciences applications. I'm particularly interested in designing effective computational models for partially- and noisily-labeled data, learning with complex label space, automating knowledge base construction, and knowledge acquisition with human in the loop.

Education

University of Illinois, Urbana-Champaign

PH.D. IN COMPUTER SCIENCE

Dec. 2017

- Thesis: *Effort-light StructMine: Turning Massive Corpora into Structures*
- Advisor: Jiawei Han. Committee member: ChengXiang Zhai, Tarek Abdelzaher, Heng Ji.

University of Illinois, Urbana-Champaign

M.SC. IN COMPUTER SCIENCE

Apr. 2016

- David J. Kuck Outstanding M.S. Thesis Award

Zhejiang University

China

B.ENG. IN COMPUTER SCIENCE, CHU KOCHEN HONORS COLLEGE

May. 2012

Employment

University of Southern California

Los Angeles, CA, USA

ASSISTANT PROFESSOR, COMPUTER SCIENCE DEPARTMENT

Jan 2018 - Present

Stanford University

Stanford, CA, USA

VISITING SCHOLAR, COMPUTER SCIENCE DEPARTMENT

Jun 2017 - Jan 2018

Pinterest

San Francisco, CA

SOFTWARE ENGINEERING INTERN, DISCOVERY TEAM

May 2016 - Aug. 2016

US Army Research Laboratory

Adelphi, MD, USA

VISITING RESEARCHER

Apr 2016 - Jun 2016

Microsoft Research

Redmond, WA, USA

RESEARCH INTERN, INTERNET SERVICES RESEARCH CENTER (ISRC)

May 2015 - Nov 2015

StylePuzzle Inc.

Champaign, IL, USA

CO-FOUNDER

Aug. 2013 - May 2014

Selected Honors & Awards

- | | |
|------|--|
| 2017 | David J. Kuck Outstanding Master Thesis Award |
| 2017 | ACM Scholarship for ACM's Celebration of 50 Years of the Turning Award |
| 2017 | WWW 2017 Outstanding Reviewer Award |
| 2016 | Google PhD Fellowship (Link) |

- 2016 C. W. Gear Outstanding Graduate Student Award (Link)
- 2015 Yahoo-DAIS Research Excellence Award
- 2015 Grand prize, Yelp Dataset Challenge (Link)
- 2015 Runner-up, Prostate Cancer DREAM challenge
- 2015 C. L. and Jane W.-S. Liu Award
- 2011 Microsoft Young Fellowship

Professional Service

ORGANIZER

First Workshop on Knowledge Base Construction, Reasoning and Mining (**KBCOM**), 2018

AREA CHAIR / SENIOR PC

International Conference on Computational Linguistics: (**COLING**): 2018

PROGRAM COMMITTEE

- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD**): 2015-18
- International World Wide Web Conference (**WWW**): 2017-18
- Annual Meeting of the Association for Computational Linguistics (**ACL**): 2017-18
- Conference on Empirical Methods in Natural Language Processing (**EMNLP**): 2015-18
- Annual Conference of the North American Chapter of the Association for Computational Linguistics (**NAACL**): 2018
- ACM SIGIR Conference on Research and Development in Information Retrieval (**SIGIR**): 2017-18
- ACM SIGMOD Conference on Management of Data (**SIGMOD**), Research Competition: 2016-17

JOURNAL REVIEWER

- IEEE Transactions on Knowledge and Data Engineering (**TKDE**)
- ACM Transactions on Knowledge Discovery from Data (**TKDD**)
- ACM Transactions on Intelligent Systems and Technology (**TIST**)
- The International Journal on Very Large Data Bases (**VLDBJ**)

Student Advising

Urvashi Khandelwal (B.S., class of 2014), CRA Outstanding Undergraduate Research Award in 2015, now a PhD student at Stanford University. Collaboration work were published in RecSys 2013, WSDM 2014 and KDD 2014.

Bradley Sturt (B.S., class of 2014), Chancellor's Scholar, now a PhD student at Massachusetts Institute of Technology. Collaboration work were published in RecSys 2013 and WSDM 2014.

Ahmed El-Kishky (Ph.D. student), NSF Graduate Research Fellowship and NDSEG Graduate Research Fellowship. Collaborator of a paper in KDD 2014, and tutorials in KDD 2015, WWW 2016 and SIGMOD 2016.

Tarique A. Siddiqui (M.Sc., class of 2016), Siebel Scholar in 2015, now a PhD student in University of Illinois at Urbana Champaign. Collaborator of a paper in CIKM 2016.

Wenqi He (M.Sc., class of 2017), Siebel Scholar in 2016. Collaborator of my papers in KDD 2016 and EMNLP 2016.

Meng Qu (M.Sc., class of 2017), Collaborator of my papers in KDD 2016 and EMNLP 2016.

Teaching

- 2016 **Guest Lecturer**, CS 412: An Introduction to Data Warehousing and Data Mining. *UIUC*
- 2014 **Student Project Leader**, CS 512: Data Mining: Principles and Algorithms. Supervised five *UIUC*

2013 **Guest Lecturer**, CS 591: Advanced Topics on Data Mining. Gave lectures on recommender
2013 **Student Project Leader**, CS 512: Data Mining: Principles and Algorithms. Supervised three

UIUC

UIUC

Talks

Invited Talks

- [17] Singapore Management University, Nov 2017.
- [16] Stanford University, InfoLab Seminar, Aug 2017.
- [15] Stanford University, NLP Seminar, Aug 2017.
- [14] Peking University, Computer Science Department, Jun 2017.
- [13] Microsoft Research Asia, Jun 2017.
- [12] Tsinghua University, Computer Science Department, Jun 2017.
- [11] Recruiting Technology, Jun 2017.
- [10] IBM Research Almaden, Jun 2017.
- [9] Duke University, Computer Science Department, March 2017.
- [8] University of California, Los Angeles, Computer Science Department, March 2017.
- [7] UC Davis, Computer Science Department, March 2017.
- [6] Georgia Tech, School of Computer Science, March 2017.
- [5] University of Southern California, Computer Science, Feb. 2017.
- [4] Google Research, August 2016.
- [3] Microsoft Bing, October 2015.
- [2] Microsoft Research Asia, September 2015.
- [1] Microsoft Research, Redmond, August 2015.

Conference Tutorials

- [8] Scalable Construction and Querying of Massive Knowledge Bases
27th International World Wide Web Conference (WWW), 2018.
- [7] Construction and Querying of Large-scale Knowledge Bases
ACM Conference on Information and Knowledge Management (CIKM), 2017.
- [6] Mining Entity-Relation-Attribute Structures from Massive Text Corpora
23th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2017.
- [5] Building Structured Databases of Factual Knowledge from Massive Text Data
2017 International Conference on Management of Data (SIGMOD), 2017.
- [4] Constructing Structured Information Networks from Massive Text Corpora
26th International World Wide Web Conference (WWW), 2017.
- [3] Automatic Entity Recognition and Typing in Massive Text Data
2016 International Conference on Management of Data (SIGMOD), 2016.
- [2] Automatic Entity Recognition and Typing in Massive Text Corpora
25th International World Wide Web Conference (WWW), 2016.
- [1] Automatic Entity Recognition and Typing from Massive Text Corpora: A Phrase and Network Mining Approach
21th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2015.

Publications

RESEARCH PAPERS UNDER REVIEW

Mining News Events from Comparable News Corpus: A Multi-Attribute Proximity Network Modeling Approach
H. Kim, X. Ren, A. El-Kishky, B. Cho, T. Hanratty and J. Han
under review, 2017

Automated Phrase Mining from Massive Text Corpora
J. Shang, J. Liu, M. Jiang, X. Ren, J. Han
under review, 2017

RESEARCH PAPERS IN JOURNALS

- [34] Linearized Alternating Direction Method with Adaptive Penalty and Warm Starts for Fast Solving Transform Invariant Low-Rank Textures
X. Ren and Z. Lin
International Journal of Computer Vision (IJCV), Volume 104 Issue 1, August 2013, Pages 1-14
- [33] Texture Repairing by Unified Low Rank Optimization
X. Liang, X. Ren, Z. Zhang, Y. Ma
Journal of Computer Science and Technology (JCST), Volume 31 Issue 3, May 2016, Pages 525-546

RESEARCH PAPERS IN CONFERENCE PROCEEDINGS

- [32] Weakly-supervised Relation Extraction by Pattern-enhanced Embedding Learning
Meng Qu, Xiang Ren, Yu Zhang, Jiawei Han
The Web Conference (WWW), 2018
- [31] Indirect Supervision for Relation Extraction using Question-Answer Pairs
Ellen Wu, Xiang Ren, Frank Xu, Ji Li, Jiawei Han
ACM International Conference on Web Search and Data Mining (WSDM), 2018
- [30] Empowering Sequence Labeling with Task-Aware Neural Language Model
L. Liu, J. Shang, X. Ren, F. Xu, H. Gui, J. Peng, J. Han.
The AAAI Conference on Artificial Intelligence (AAAI), 2018
- [29] Dynamic Network Embedding by Modeling Triadic Closure Process
Lekui Zhou, Yang Yang, Xiang Ren, Fei Wu, Yueting Zhuang
The AAAI Conference on Artificial Intelligence (AAAI), 2018
- [28] Heterogeneous Supervision for Relation Extraction: A Representation Learning Approach
L. Liu, X. Ren, Q. Zhu, S. Zhi, H. Gui, H. Ji, J. Han.
2017 Conference on Empirical Methods in Natural Language Processing (EMNLP), 2017
- [27] Life-iNet: A Structured Network-Based Knowledge Exploration and Analytics System for Life Sciences
X. Ren, J. Shen, M. Qu, X. Wang, Z. Wu, Q. Zhu, M. Jiang, F. Tao, S. Sinha, D. Liem, P. Ping, R. Weinsilboum, J. Han
Annual Meeting of the Association for Computational Linguistics (ACL), 2017 (Demo Paper)
- [26] An Attention-based Collaboration Framework for Multi-View Network Representation Learning
M. Qu, J. Tang, J. Shang, X. Ren, M. Zhang, J. Han
26th ACM International Conference on Information and Knowledge Management (CIKM), 2017
- [25] Automatic Synonym Discovery with Knowledge Bases
M. Qu, X. Ren, J. Han
23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2017
- [24] MetaPAD: Meta Pattern-driven Attribute Discovery in Massive Text Corpora
M. Jiang, J. Shang, T. Cassidy, X. Ren, L. M. Kaplan, T. P. Hanratty, J. Han
23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2017
- [23] CoType: Joint Extraction of Typed Entities and Relations with Knowledge Bases
X. Ren, Z. Qiu, W. He, M. Qu, C. R. Voss, H. Ji, T. F. Abdelzaher, J. Han
26th International Conference on World Wide Web (WWW), 2017.
(Acceptance rate: $164/966 = 17\%$) **SIGMOD 2017 Student Research Competition, Final List.**
- [22] Comparative Document Analysis for Large Text Corpora
X. Ren, Y. Lv, K. Wang, J. Han.
10th ACM International Conference on Web Search and Data Mining (WSDM), 2017
(Acceptance rate: $80/505 = 16\%$)

- [21] AFET: Automatic Fine-Grained Entity Typing by Hierarchical Partial-Label Embedding
 X. Ren, W. He, M. Qu, H. Ji, C. R. Voss, J. Han.
2016 Conference on Empirical Methods in Natural Language Processing (EMNLP), 2016, Pages 1369-1378
 Long paper, oral presentation. (Acceptance rate: 109/1087 = **10%**)
- [20] Label Noise Reduction in Entity Typing by Heterogeneous Partial-Label Embedding
 X. Ren, W. He, M. Qu, H. Ji, C. R. Voss, J. Han.
22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2016, Pages 1825-1834
 (Acceptance rate: 66/1115 = **6%**)
- [19] FacetGist: Collective Extraction of Document Facets in Large Technical Corpora
 T. A. Siddiqui*, X. Ren*, A. Parameswaran, J. Han
25th ACM International Conference on Information and Knowledge Management (CIKM), 2016, Pages 871-880
 (Acceptance rate: 160/701 = 23%) *Equal contribution.
- [18] Representing Documents via Latent Keyphrase Inference
 J. Liu, X. Ren, J. Shang, T. Cassidy, C. R. Voss, J. Han
25th International Conference on World Wide Web (WWW), 2016, Pages 1057-1067
 (Acceptance rate: 115/727 = 16%)
- [17] Precision Matrix Estimation in High Dimensional Gaussian Graphical Models with Faster Rates
 L. Wang, X. Ren, Q. Gu
19th International Conference on Artificial Intelligence and Statistics (AISTATS), 2016, Pages 177-185
 (Acceptance rate: 129/537 = 24%)
- [16] ClusType: Effective Entity Recognition and Typing by Relation Phrase-Based Clustering
 X. Ren, A. El-Kishky, C. Wang, F. Tao, C. R. Voss, H. Ji, J. Han
21th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2015, Pages 995-1004
 (Acceptance rate: 20%)
Presented as (an essential) part of ACL 2015 keynote “Construction and Mining of Heterogeneous Information Networks from Text data”
- [15] Synonym Discovery for Structured Entities on Heterogeneous Graphs
 X. Ren, and T. Cheng
24th International Conference on World Wide Web (WWW), 2015, Pages 443-453
 Industry track paper. (Acceptance rate: 10/929 = **1%**).
- [14] Mining Quality Phrases from Massive Text Corpora
 J. Liu, J. Shang, C. Wang, X. Ren, J. Han
2015 ACM SIGMOD International Conference on Management of Data (SIGMOD), 2015, Pages 1729-1744
 (Acceptance rate: 26%) **Won grand prize of Yelp Dataset Challenges in 2015.**
- [13] ClusCite: Effective Citation Recommendation by Information Network-Based Clustering
 X. Ren, J. Liu, X. Yu, U. Khandelwal, Q. Gu, L. Wang, J. Han
20th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2014, Pages 821-830
 (Acceptance rate: 14.7%)
- [12] Heterogeneous Graph-Based Intent Learning from Queries, Web Pages and Wikipedia Concepts
 X. Ren, Y. Wang, X. Yu, J. Yan, Z. Chen, J. Han
7th ACM International Conference on Web Search and Data Mining (WSDM), 2014, Pages 23-32
 (Acceptance rate: 64/335 = 18%)
- [11] Personalized Entity Recommendation: A Heterogeneous Information Network Approach
 X. Yu, X. Ren, Y. Sun, Q. Gu, B. Sturt, U. Khandelwal, B. Norick, J. Han
7th ACM International Conference on Web Search and Data Mining (WSDM), 2014, Pages 283-292
 (Acceptance rate: 18%, **citation: 63**)
- [10] Automatic Construction and Ranking of Topical Keyphrases on Collections of Short Documents
 M. Danilevsky, C. Wang, N. Desai, X. Ren, J. Guo, J. Han
2014 SIAM International Conference on Data Mining (SDM), 2014, Pages 398-406
 (Acceptance rate: 15%)
- [9] Semantic Frame-Based Document Representation for Comparable Corpora
 H. Kim, X. Ren, Y. Sun, C. Wang, J. Han
IEEE 13th International Conference on Data Mining (ICDM), 2013, Pages 350-359
 (Acceptance rate: 94/809 = 11.6%)
- [8] HeteRec: Entity Recommendation in Heterogeneous Information Networks with Implicit User Feedback
 X. Yu, X. Ren, Y. Sun, B. Sturt, U. Khandelwal, Q. Gu, B. Norick, J. Han
7th ACM Recommender Systems Conference (RecSys), 2013, Pages 347-350
 (Acceptance rate: 23%)

- [7] Repairing Sparse Low Rank Texture
X. Liang, X. Ren, Z. Zhang, Y. Ma
14th European Conference on Computer Vision (ECCV), 2012, Pages 482-495
(Acceptance rate: 28%)
- [6] A Non-convex Relaxation Approach to Sparse Dictionary Learning
J. Shi*, X. Ren*, G. Dai, J. Wang, Z. Zhang
2011 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2011, Pages 1809-1816
Oral presentation. (Acceptance rate: **3.7%**) *Equal contribution.

RESEARCH PAPERS IN WORKSHOP PROCEEDINGS

- [5] Entity Typing: A Critical Step for Mining Structures from Massive Unstructured Text
X. Ren, W. He, A. El-Kishky, C. R. Voss, H. Ji, M. Qu, J. Han
12th International Workshop on Mining and Learning with Graphs (MLG), 2016. **(Invited Paper)**
- [4] Collaborative Filtering with Entity Similarity Regularization in Heterogeneous Information Networks
X. Yu, X. Ren, Q. Gu, Y. Sun, J. Han
2th IJCAI Workshop on Heterogeneous Information Network Analysis (IJCAI-HINA), 2013. **(Invited Paper)**

DEMONSTRATION PAPERS IN CONFERENCE PROCEEDINGS

- [3] LifeNet: A Structured Network-Based Knowledge Exploration and Analytics System for Life Sciences
X. Ren, J. Shen, M. Qu, X. Wang, Z. Wu, Q. Zhu, M. Jiang, F. Tao, S. Sinha, D. Liem, P. Ping, R. Weinshilboum, J. Han
2017 Annual Meeting of the Association for Computational Linguistics (ACL), 2016
- [2] Cross-media Event Extraction and Recommendation (**system demo**)
D. Lu, C. R. Voss, F. Tao, X. Ren, R. Guan, R. Korolov, T. Zhang, D. Wang, H. Li, T. Cassidy, H. Ji, S. Chang, J. Han, W. Wallace, J. Hendler, M. Si, L. Kaplan
2016 Conference of the North American Chapter of the Association for Computational Linguistics (NAACL), 2016
- [1] NewsNetExplorer: Automatic Construction and Exploration of News Information Networks
F. Tao, J. Han, H. Ji, G. Brova, C. Wang, A. El-Kishky, J. Liu, X. Ren, Y. Sun
2014 International Conference on Management of Data (SIGMOD), 2014