Suhang Wang

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Research Interests: Data Mining, Machine Learning, Deep Learning and Optimization

Education

Arizona State University (ASU), Tempe, AZ, USA Jan. 2014 - Present
- Ph.D. in Computer Science
- Thesis Topic: Representation Learning for Complex Networks
- Area of Study: Data mining, Machine Learning, Optimization
- Advisor: Professor Huan Liu
- GPA: 4.0/4.0

University of Michigan at Ann Arbor (UMich), MI, USA Sept. 2012 - Dec. 2013
- M.S. in Electrical Engineering: Systems
- Area of Study: Digital Signal Processing(major), Computer Science(minor)
- Major GPA: 4.0/4.0

University of Michigan at Ann Arbor (UMich), MI, USA Sept. 2010 - Apr. 2012
- B.S. in Electrical Engineering
- *Summa Cum Laude*, with Honors in Engineering
- GPA: 3.92/4.0

Shanghai Jiao Tong University (SJTU), Shanghai, China Sept. 2008 - Aug. 2012
- B.S. in Electrical and Computer Engineering
- GPA: 3.78/4.0

Summary of Publications

My publications can be generally categorized into the following areas, and a representative paper is listed under each area:

- **Network Representation Learning** [22],[17],[26],[25],[45],[43]
  - **Suhang Wang**, Jiliang Tang, Charu Aggarwal, Yi Chang, Huan Liu. Signed Network Embedding in Social Media. *In Proceedings of the Seventeenth SIAM International Conference on Data Mining (SDM 2017)*
- **Feature Selection and Extraction** [36],[3],[21],[18],[9],[47]
  - **Suhang Wang**, Charu Aggarwal, Huan Liu. Randomized Feature Engineering as a Fast and Accurate Alternative to Kernel Methods. *In Proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2017)*
- **Deep Learning** [20],[19],[22][2],[22],[49], [16]
  - **Suhang Wang**, Charu Aggarwal, Huan Liu. Using a Random Forest to Inspire a Neural Network and Improving on It. *In Proceedings of the Seventeenth SIAM International Conference on Data Mining (SDM 2017)*
- **Recommendation and Information Retrieval** [34],[33],[19],[30],[8],[15]
  - **Suhang Wang**, Yilin Wang, Jiliang Tang, Kai Shu, Suhas Ranganath and Huan Liu. What Your Images Reveal: Exploiting Visual Contents for Point-of-Interest Recommendation. *In Proceedings of the 26th World Wide Web Conference (WWW 2017)*
- **Privacy and Security** [14],[6],[48]
  - Xuying Meng, **Suhang Wang**, Kai Shu, Jundong Li, Bo Chen, Huan Liu, Yujun Zhang. Personalized Privacy-Preserving Social Recommendation. *In*

Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence (AAAI 2018)

As of December 2017, my Google Scholar citation is 370 and h-index is 11.

BOOKS OR BOOK CHAPTERS

[1] Dongwon Lee, **Suhang Wang** and Huan Liu. Like and Recommendation. (In Preparation)

[2] **Suhang Wang**, Huan Liu. Deep Learning for Feature Representation. *Feature Engineering*, CRC Press (To Appear)

[3] **Suhang Wang**, Jiliang Tang, and Huan Liu. Feature Selection. *Encyclopedia of Machine Learning and Data Mining, 2016*

REFERRED JOURNAL PUBLICATIONS

[4] **Suhang Wang**, Jiliang Tang, Yilin Wang, Huan Liu. Exploiting Hierarchical Structures for Recommender Systems. *IEEE TKDE, 2018*

[5] Yang Li, Tao Yang, **Suhang Wang**, Jiliang Tang, Quan Pan, Erik Cambria. Learning Word Representations for Sentiment Classification. *Cognitive Computation, 2017*

[6] Kai Shu, Amy Slivaz, **Suhang Wang**, Jiliang Tang, Huan Liu. Fake News Detection on Social Media: A Data Mining Perspective. *SIGKDD Explorations, 2017*

[7] Suhas Ranganath, Xia Hu, Jiliang Tang, **Suhang Wang** and Huan Liu. Understanding and Identifying Rhetorical Questions in Social Media. *ACM TIST, 2017*

[8] Suhas Ranganath, **Suhang Wang**, Xia Hu, Jiliang Tang and Huan Liu. Finding Time-Critical Responses for Information Seeking in Social Media. *IEEE TKDE, 2017*

[9] Jundong Li, Kewei Cheng, **Suhang Wang**, Fred Morstatter, Robert P Trevino, Jiliang Tang, Huan Liu. Feature Selection: A Data Perspective. *ACM Computing Surveys (CSUR), 2017*

[10] Kai Shu, **Suhang Wang**, Jiliang Tang, Reza, Zafarani, Huan Liu. User Identity Linkage across Online Social Networks: A Review. *SIGKDD Explorations, 2016*

[11] Yong Peng, Bao-Liang Lu and **Suhang Wang**. Enhanced Low-rank Representation via Sparse Manifold Adaption for Semi-supervised Learning. *Neural Networks*, DOI: 10.1016/j.neunet.2015.01.001, 2015

[12] Yong Peng, **Suhang Wang**, Xianzhong Long and Bao-Liang Lu. Discriminative Graph Regularized Extreme Learning Machine and Its Application to Face Recognition. *Neurocomputing*, 149: 340-353, 2015

REFEREED CONFERENCE PUBLICATIONS

[13] Xuying Meng, **Suhang Wang**, Huan Liu, Yujun Zhang. Exploiting Emotion on Reviews for Recommender Systems. *In Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence (AAAI 2018)*

[14] Xuying Meng, **Suhang Wang**, Kai Shu, Jundong Li, Bo Chen, Huan Liu, Yujun Zhang. Personalized Privacy-Preserving Social Recommendation. *In Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence (AAAI 2018)*

[15] Kai Shu, **Suhang Wang**, Jiliang Tang, Yilin Wang, Huan Liu. CrossFire: Cross Media Joint Item and Friend Recommendations. *In Proceedings of the 11th ACM International Conference on Web Search and Data Mining (WSDM 2018)*

[16] Yilin Wang, **Suhang Wang**, Guojun Qi, Jiliang Tang, Baoxin Li. Weakly Supervised Facial Attribute Manipulation via Deep Adversarial Network. *In Proceedings of the 2018 IEEE Winter Conference on Applications of Computer Vision (WACV 2018)*

[17] **Suhang Wang**, Charu Aggarwal, Jiliang Tang, Huan Liu. Attributed Signed Network Embedding. *In Proceedings of 26th ACM International Conference on Information and Knowledge Management (CIKM 2017)*

[18] **Suhang Wang**, Charu Aggarwal, Huan Liu. Randomized Feature Engineering as a Fast and Accurate Alternative to Kernel Methods. *In Proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2017)*

[19] **Suhang Wang**, Yilin Wang, Jiliang Tang, Kai Shu, Suhas Ranganath and Huan Liu. What Your Images Reveal: Exploiting Visual Contents for Point-of-Interest Recommendation. *In Proceedings of the 26th World Wide Web Conference (WWW 2017)*

[20] **Suhang Wang**, Charu Aggarwal, Huan Liu. Using a Random Forest to Inspire a Neural Network and Improving on It. *In Proceedings of the Seventeenth SIAM International Conference on Data Mining (SDM 2017)*

[21] **Suhang Wang**, Yilin Wang, Jiliang Tang, Charu Aggarwal, Suhas Ranganath, Huan Liu. Exploiting Hierarchical Structures for Unsupervised Feature Selection. *In Proceedings of the Seventeenth SIAM International Conference on Data Mining (SDM 2017)*

[22] **Suhang Wang**, Jiliang Tang, Charu Aggarwal, Yi Chang, Huan Liu. Signed Network Embedding in Social Media. *In Proceedings of the Seventeenth SIAM International Conference on Data Mining (SDM 2017)*

[23] Yang Li, **Suhang Wang**, Quan Pan, Tao Yang, Jiliang Tang. Price Recommendation on Vacation Rental Websites. *In Proceedings of the Seventeenth SIAM International Conference on Data Mining (SDM 2017)*

[24] Yilin Wang, **Suhang Wang**, Jiliang Tang, Guojun Qi, Huan Liu and Baoxin Li. CLARE:A Joint Approach to Label Classification and Tag Recommendation. *In Proceedings of the Thirty-First AAAI Conference on Artificial Intelligence*(AAAI 2017)

[25] **Suhang Wang**, Jiliang Tang, Fred Morstatter and Huan Liu. Paired Restricted Boltzmann Machine for Linked Data. *In Proceedings of 25th ACM International Conference on Information and Knowledge Management (CIKM-16)*

[26] **Suhang Wang**, Jiliang Tang, Charu Aggarwal, Yi Chang and Huan Liu. Linked Document Embedding for Classification. *In Proceedings of 25th ACM International Conference on Information and Knowledge Management (CIKM-16)*

[27] Yilin Wang, **Suhang Wang**, Jiliang Tang, Huan Liu and Baoxin Li. PPP: Joint Pointwise and Pairwise Image Label Prediction. *In Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR-16)*

[28] Suhas Ranganath, Xia Hu, Jiliang Tang, **Suhang Wang** and Huan Liu. Understanding and Identifying Rhetorical Questions in Social Media. *In: Proceedings of The International AAAI Conference on Web and Social Media (ICWSM-16)*

[29] Ghazaleh Beigi, Jiliang Tang, **Suhang Wang**, Huan Liu. Exploiting Interaction Data for Trust and Distrust Prediction. *In Proceedings of the SIAM International Conference on Data Mining (SDM), 2016*

[30] Jiliang Tang , **SuhangWang**, Xia Hu, Dawei Yin, Yingzhou Bi, Yi Chang and Huan Liu. Recommendation with Social Dimensions. *In Proceedings of the Thirtieth AAAI Conference on Artificial Intelligence*(AAAI 2016), Phoenix, AZ

[31] Suhas Ranganath, Fred Morstatter, Xia Hu, Jiliang Tang, **Suhang Wang**, Huan Liu. Predicting Online Protest Participation of Social Media Users. *In Proceedings of the Thirtieth AAAI Conference on Artificial Intelligence*(AAAI 2016), Phoenix, AZ

[32] Suhas Ranganath, **Suhang Wang**, Xia Hu, Jiliang Tang and Huan Liu. Finding Time-Critical Responses for Information Seeking in Social Media. *14th IEEE International Conference on Data Mining* (ICDM 2015), Atlantic City, NJ

[33] **Suhang Wang**, Jiliang Tang and Huan Liu. Toward Dual Role of Users in Recommender Systems. *24th ACM International Conference on Information and Knowledge Management*(CIKM 2015), Melbourne, Australia

[34] **Suhang Wang**, Jiliang Tang and Huan Liu. Exploring Implicit Hierarchical Structure for Recommender Systems. *24th International Joint Conference on Artificial Intelligence*(IJCAI 2015), Buenos Aires, Argentina

[35] Yilin Wang, **Suhang Wang**, Jiliang Tang and Huan Liu. Unsupervised Sentiment Analysis for Social Media Images. *24th International Joint Conference on Artificial Intelligence*(IJCAI 2015), Buenos Aires, Argentina

[36] **Suhang Wang**, Jiliang Tang and Huan Liu. Embedded Unsupervised Feature Selection. *Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence*(AAAI 2015), Austin, TX

[37] Yong Peng, **Suhang Wang**, Shen Wang and Bao-Liang Lu. Structure Preserving Low-rank Representation for Semi-supervised Face Recognition. *International Conference on Neural Information Processing*(ICONIP2013)

WORKSHOP PAPERS

[38] Kai Shu, **Suhang Wang**, Huan Liu. Understanding User Profiles on Social Media for Fake News Detection. *In Proceedings of the 1st IEEE International Workshop on Fake MultiMedia* (FakeMM-18)

[39] Yao Ma, **Suhang Wang**, Jiliang Tang. Network Embedding with Centrality Information. *In Proceedings of the IEEE International Conference on Data Mining Workshops* (ICDMW-17)

PREPRINTS

[40] **Suhang Wang**, Charu Aggarwal, Huan Liu. Random-Forests Inspired Neural Networks. (ACM TIST Under Review)

[41] Xuying Meng, **Suhang Wang**, Kai Shu, Bo Chen, Jundong Li, Huan Liu, Yujun Zhang. Personalized Privacy-Preserving for Social Recommendation. (WWW Journal Under Review)

[42] Wen Zhang, Kai Shu, **Suhang Wang**, Huan Liu, Yalin Wang. Longitudinal Multimodal Neuroimaging Data Fusion of Brain Networks: A Network Representation Learning Approach. (Submitted to CVPR-18)

[43] Tyler Derr, Chenxing Wang, **Suhang Wang** and Jiliang Tang. Node Relevance Measurements in Online Signed Social Networks.

[44] Yilin Wang, Liangda Li, **Suhang Wang**, Jiliang Tang, Hongbo Deng, Yi Chang and Baoxin Li. Query Auto Completion in Blended Search.

[45] Yao Ma, **Suhang Wang**, Zhaochun Ren, Dawei Yin, Jiliang Tang. Preserving Local and Global Information for Network Embedding.

[46] Kai Shu, **Suhang Wang**, Jiliang Tang, Yi Chang, Huan Liu. Exploiting User Actions for App Recommendations.

[47] Yang Li, Quan Pan, **Suhang Wang**, Haiyun Peng, Tao Yang, Erik Cambria. Disentangled Variational Auto-Encoder for Semi-supervised Learning. (Neurocomputing Under Review)

[48] Kai Shu, **Suhang Wang**, Huan Liu. A Tri-Relationship Embedding Approach for Fake News Detection.

[49] Yang Li, Quan Pan, **Suhang Wang**, Tao Yang, Erik Cambria. Categorized Text Generation with Generative Models. (Information Science Major Revision)

[50] Fred Morstatter, **Suhang Wang**, Huan Liu. Analogy-Oriented Word Embeddings with Exogenous Relationships.

[51] Fred Morstatter, Kai Shu, **Suhang Wang**, Huan Liu. Cross-Platform Emoji Interpretation: Analysis, a Solution, and Applications. (arXiv)

[52] Yilin Wang, **Suhang Wang**, Jiliang Tang, Neil O'Hare, Yi Chang and Baoxin Li. Hierarchical Attention Network for Action Recognition in Videos. (arXiv)

Professional Experience

Data Scientist Intern May 2017 - August 2017
Clari Inc. Sunnyvale, CA
Supervisor: Lei Tang

Research Intern May 2016 - August 2017
IBM T.J. Watson Research Center, Yorktown Heights, NY
Supervisor: Dr. Charu Aggarwal

Graduate Research Assistant Summer 2014 - Present
Machine Learning and Data Mining Lab, ASU
Supervisor: Prof. Huan Liu

Teaching Experience

Teaching Assistant Fall 2016
CSE 691: Advanced Topics on Social Media Analysis, ASU
Instructor: Prof. Huan Liu

Teaching Assistant Fall 2015
CSE 472/598: Social Media Mining, ASU
Instructor: Prof. Huan Liu

Teaching Assistant Spring 2014
CSE 230: Computer Organization and Assembly Language Programming, ASU
Instructor: Dr. Mutsumi Nakamura

Teaching Assistant/Lab Instructor Spring 2014
CSE 100: Principles of Programming with C++, ASU
Instructor: Prof. DeLibero Joseph

Students & Mentees

Ph.D Students

- **Yao Ma**, CSE@Michigan State University Mar. 2017 Present
  Preprint [45]
  Co-advising with Prof. Jiliang Tang
- **Xuying Meng**, CS@Univ. of Chinese Academy of Sciences Oct. 2016 - Apr. 2017
  Referred conference papers [13],[14]
  Co-advising with Prof. Huan Liu and Prof. Yujun Zhang
- **Yang Li**, CSE@Northwestern Polytechnical Univ. Sept. 2016 - Present Referred papers [23],[5], preprints [49],[47]
  Co-advising with Prof. Quan Pan and Prof. Erik Cambria
- **Kai Shu**, CSE@ASU December 2015 - Present
  Referred papers [10],[6],[15], preprints [46],[48]
  Co-advising with Prof. Huan Liu

Master Students

- **Palak Anmol:** CSE@ASU February 2017 - April 2017
  Advising on personal identity identification project
- **Ravi Teja Pinnaka:** CSE@ASU March 2017 - May 2017
  Advising on personal identity identification project

Undergraduate Student

- **Daniel Baird:** Honors College@ASU — August 2017 - Present
  Advising on honor thesis
  Co-advising with Prof. Huan Liu

Patent

- **Suhang Wang**, Jiliang Tang, Huan Liu. Systems and methods for embedded unsupervised feature selection. US Patent App. 15/412,909.

Selected Honors

Merit-based Scholarships

- University Graduate Fellowship, ASU — Spring 2014 - Fall 2014, Spring 2017
- Excellent Student Capstone Project, Intel, Shanghai, China — August 2012
- James B. Angell Scholar, UMich — March 2012
- Outstanding Student Scholarship, SJTU — 2009, 2010
- University Honors, UMich — all semesters
- Dean's List, EECS, UMich — all semesters
- Dean's List, Joint Institute, SJTU — all semesters

Travel Awards

- KDD 2017 Student Travel Grant Award, — August 2017
- SDM 2017 Student Travel Grant Award, — April 2017
- CIKM 2016 Student Travel Grant Award, — October 2016
- CIKM 2015 Student Travel Grant Award, — October 2015
- IJCAI 2015 Student Travel Grant Award, — July 2017

Media Coverage

- The blog article about our survey paper Fake News Detection on Social Media is among the most shared last week in KDNuggets, Oct. 9-15, 2017.
- KDnuggets, 5 Machine Learning Projects You Can No Longer Overlook, April 2017. Our scikit-feature project is #2.
- Our work on protest prediction is reported by ValueWalk, Mic News, Inverse, Indian Express, Newsgram, Business Standard, Business Insider, BGR, NextGov, Defense One.

Software Produced

- Co-author of Scikit-Feature, which is a popular feature selection toolkit that implements more than 25 representative and state-of-the-art feature selection methods

Service

- **Program Committee Member:** IJCAI (2016, 2017), AAAI 2018, WSDM Workshop 2018, PAKDD 2018
- **Journal Reviewer:** ACM TKDD, IEEE TKDE, IEEE TBD, Neurocomputing, Pattern Recognition, EURASIP J Bioinform Syst Biol, Internet Research
- **Conference Reviewer:** WSDM (2016, 2017), AAAI (2016 - 2018), IJCAI (2015 - 2017), ASONAM (2015 - 2017), CIKM (2015, 2016), WWW (2015, 2016), SDM (2015 - 2017), RecSys (2014, 2017), SIGIR 2017, KDD 2016, NIPS 2016, ICDM 2014, ICHI 2015, WebScience 2014, CitRec 2017

Skills

Programming: C/C++, MATLAB, Java, Python, Scala
Applications: SQL, Hadoop, Spark, MongoDB, LaTeX, FPGA, TensorFlow