Yinghui Wu

| CONTACT INFORMATION | School of Electrical Engineering & Computer Science
Washington State University
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PROFESSIONAL APPOINTMENTS

Washington State University, Pullman, WA USA — **2014 -Present**
Assistant Professor, School of Electrical Engineering and Computer Science

Pacific Northwest National Laboratory, Richland, WA USA — **2017 - Present**
Staff Scientist (Joint), Advanced Computing, Mathematics, and Data Division

University of California Santa Barbara, Santa Barbara, CA USA — **2011 - 2014**
Research Scientist, Department of Computer Science

University of Edinburgh, Edinburgh, UK — **2010 - 2011**
Research Assistant, School of Informatics

EDUCATION

The University of Edinburgh, Edinburgh, UK — **2010**
Ph.D. in Computer Science (Advisor: Wenfei Fan)

Peking University, Beijing, China — **2007**
B.S. in Computer Science

Peking University, Beijing, China — **2007**
B.S. Double Major in Economics

RESEARCH THEMES

Data Management, Database Systems, Graph Data Analysis, Data quality

Big Data Applications in Cyber Security, Network Science, and Smart Environment

AWARDS AND HONORS

ACM SIGMOD Research Highlight Award	**2018**
ACM SIGMOD Best Paper Award	**2017**
VLDB Best Demo Award	**2017**
Google Faculty Research Award	**2015**
ICDE Best Paper Runner Up	**2014**
ICDE Best Poster Award	**2013**

RESEARCH GRANT

Current Grants

NSF/USDA 2018-67007-28797: CPS Medium: SMART IRRIGATION - Big Data approach for Accurate Water Stress Detection and Precision Irrigation in Fruit Crops, Co-PI. 2018-2022, Amount $691,508. Personal Share $229,889

DOE UI-ASSIST: US-India Collaborative for Smart Distribution System With Storage, Faculty Investigator, 2018-2020, Personal Share $150,000.

NSF IIS 1633629: BIGDATA: Collaborative Research: F: Association Analysis of Big Graphs: Models, Algorithms and Applications, Lead PI, 2016-2019, Amount $321,678.

Kronos: Knowledge Base of Real-time Power Event on Heterogeneous Data Streams (Industry Partners), PI, 2018-2019, Amount $115,000

Completed Grants

Google Faculty Research Award: Adaptive Graph Search, PI, 2016-2017, Amount $70,000.

Discovering Associations in Attributed Networks (Industry Partners), PI, 2017-2018, Amount $50,000

TEACHING

Advanced Databases, WSU (Graduate, Spring '16, Spring '17, Spring '18)

Topics in Graph Mining, WSU (Graduate, Spring '15)

Big Data, WSU (Undergraduate, Fall '15, Fall '16, Fall '17, Fall '18)

Formal Language and Automata, WSU (Undergraduate, Spring '18, Spring '19)

Seminars on Data Mining, UC Santa Barbara (Graduate, Fall '13)

Advanced Topics in Web Databases, U of Edinburgh (Graduate, Spring '09, Spring '10, Spring '11)

Topics in Distributed Databases, U of Edinburgh (Graduate, Spring '09, Spring '10, Spring '11)

PUBLICATIONS

Total Citations 1510+; *h-index 20.*
*: authors are listed in alphabetical order (equal contribution). ⋆: current student

Journal Articles

J.1 Peng Lin⋆, Qi Song⋆, **Yinghui Wu**, Jiaxing Pi. Discovering Patterns for Fact Checking in Knowledge Graphs. *ACM Journal of Data and Information Quality*, 2019

J.2 Peng Lin⋆, Qi Song⋆, **Yinghui Wu**. Fact Checking in Knowledge Graphs with Ontological Subgraph Patterns Data Science & Engineering, 2019

J.3 Qi Song⋆, **Yinghui Wu**, Peng Lin⋆, Xin (Luna) Dong, Hui Sun. Mining Summaries for Knowledge Graph Search. *IEEE Transactions on Knowledge and Data Engineering*, 30(10), 1887-1900, 2018

J.4 Mengze Zhou⋆, Yuhui Wang, Anurag K Srivastava, **Yinghui Wu**, Paramarshi Banerjee. Ensemble Based Algorithm For Syncrophasor Data Anomaly Detection. *IEEE Transactions on Smart Grid*, 2018

J.5 Wenfei Fan, Yang Cao, Jingbo Xu, Wenyuan Yu, **Yinghui Wu**, Chao Tian, Jiaxin Jiang, Bohan Zhang. From Think Parallel to Think Sequential. *SIGMOD Record*, 47.1: 15-22, 2018

J.6   Wenfei Fan, Jingbo Xu, Xiaojian Luo, **Yinghui Wu**, Wenyuan Yu, and Ruiqi Xu GRAPE: Conducting Parallel Graph Computations without Developing Parallel Algorithms. *IEEE Data Eng. Bull* 40(3): 30-41, 2017.

J.7   Lawence B.Holder, Rajmonda Caceres, David F.Gleich, Jason Riedy, Maleq Khan, Nitesh V.Chawla, Ravi Kumar, **Yinghui Wu**, Christine Klymko, Tina Eliassi-Rad, Aditya Prakash, Current and Future Challenges in Mining Large Networks: Report on the Second SDM Workshop on Mining Networks and Graphs. *ACM SIGKDD Explorations Newsletter* 18.1: 39-45, 2016.

J.8   Wenfei Fan, Xin Wang, **Yinghui Wu***. Answering graph query using views. *IEEE Transactions on Knowledge and Data Engineering*, 2015.

J.9   Wenfei Fan, Xin Wang, **Yinghui Wu***. Incremental Graph Pattern Matching. *ACM Transactions on Database Systems*, 2013.

J.10   Wenfei Fan, Jianzhong Li, Jizhou Luo, Zijing Tan, Xin Wang, **Yinghui Wu***. Adding regular expressions to graph reachability and pattern queries. *Frontiers of Computer Science*, 2012

J.11   Ting Deng, Wenfei Fan, Leonid Libkin, **Yinghui Wu***. On the Aggregation problem for Synthesized Web Services. *Journal of Computer and System Science.* 2011

J.12   Wenfei Fan, Jianzhong Li, Shuai Ma, Hongzhi Wang, **Yinghui Wu***. Graph Homomorphism Revisited for Graph Matching. *Proceedings of the VLDB Endowment*, 3(1-2): 1161-1172, 2010.

Refereed Conference Papers

C.1   Qi Song*, Mohammad Hossein Namaki*, Yinghui Wu. Answering Why-Questions for Subgraph Queries in Attributed Graphs. *International Conference on Data Engineering* (**ICDE**), 2019.

C.2   Xuanming Liu, Tingjian Ge, Yinghui Wu. Finding Densest Lasting Subgraphs in Dynamic Graphs: a Stochastic Approach. *International Conference on Data Engineering* (**ICDE**), 2019.

C.3   Mohammad Hossein Namaki*, Yinghui Wu, Xin Zhang*. GExp: Cost-aware Graph Exploration with Keywords. *ACM SIGMOD Conference on Management of Data* (**SIGMOD**), 2018.

C.4   Qi Song*, Bo Zong, Yinghui Wu, Lu-An Tang, Hui Zhang, Guofei Jiang and Haifeng Chen. TGNet: Learning to Rank Nodes in Temporal Graphs *The 27th ACM International Conference on Information and Knowledge Management* (**CIKM**), 2018

C.5   Peng Lin*, Qi Song*, Jialiang Shen, Yinghui Wu. Discovering Graph Patterns for Fact Checking in Knowledge Graphs. *23rd International Conference on Database Systems for Advanced Applications* (**DASFAA**), 2018

C.6   Keyvan Sasani*, Mohammad Hossein Namaki*, Yinghui Wu, Assefaw Gebremedhin. Multimetric Graph Query Performance Prediction. *23rd International Conference on Database Systems for Advanced Applications* (**DASFAA**), 2018

C.7   Mohammad Hossein Namaki*, Yinghui Wu, Xin Zhang*. Diversified Keyword Expansion on Multi-labeled Graphs. ***APWeb-WAIM*** *Joint Conference on Web and Big Data*, 2018

C.8   Sutanay Choudhury, Sumit Purohit, Peng Lin*, Yinghui Wu, Lawrence Holder, Khushbu Agarwal. Percolator: Scalable Pattern Discovery in Dynamic Graphs. *ACM International Conference on Web Search and Data Mining* (**WSDM**), 2018

C.9   Mohammad Hossein Namaki*, Yinghui Wu, Qi Song*, Peng Lin*, Tingjian Ge, Discovering Temporal Graph Association Rules. *The 26th ACM International Conference on Information and Knowledge Management* (**CIKM**), 2017

C.10   Mohammad Hossein Namaki⋆, Peng Lin⋆, **Yinghui Wu**, Event Pattern Discovery by Keywords in Graph Streams. *IEEE International Conference on Big Data* (**IEEE BigData**), 2017

C.11   Mohammad Hossein Namaki⋆, Keyvan Sasani⋆, **Yinghui Wu**, Tingjian Ge. BEAMS: Bounded Event Detection over Graph Streams. *International Conference on Data Engineering* (**ICDE**), 2017.

C.12   Mohammad Hossein Namaki⋆, F A Rezaur Rahman Chuwdhury, Md Rakibul Islam, Janardhan Rao Doppa, **Yinghui Wu**. Learning to Speed Up Query Planning in Graph Databases. *International Conference on Automated Planning and Scheduling* (**ICAPS**), 2017.

C.13   Wenfei Fan, Jingbo Xu, **Yinghui Wu**, Jiaxin Jiang, Zeyu Zheng, Bohan Zhang, Yang Cao, Chao Tian. Parallelizing Sequential Graph Computations. *ACM SIGMOD Conference on Management of Data* (**SIGMOD**), 2017. **Best Paper Award**

C.14   Wenfei Fan, Xueli Liu, **Yinghui Wu**, Jingbo Xu and Ping Lu. GRAPE: Parallelizing Sequential Graph Computations. *International Conference on Very Large Data Bases* (**VLDB**), 2017. **Best Demonstration Award**

C.15   Qi Song⋆, **Yinghui Wu**, Xin Luna Dong. Mining Summaries for Knowledge Graph Search. *The IEEE International Conference on Data Mining series* (**ICDM**), 2016.

C.16   Wenfei Fan, **Yinghui Wu***, Jingbo Xu. Functional Dependencies for Graphs. *ACM SIGMOD Conference on Management of Data* (**SIGMOD**), 2016.

C.17   Shengqi Yang, Fangqiu Han, **Yinghui Wu**, Xifeng Yan. Fast Top-k Search in Knowledge Graphs. *International Conference on Data Engineering* (**ICDE**), 2016.

C.18   Wenfei Fan, **Yinghui Wu***, Jingbo Xu. Adding Counting Quantifiers to Graph Patterns. *ACM SIGMOD Conference on Management of Data* (**SIGMOD**), 2016.

C.19   Wenfei Fan, Xin Wang, **Yinghui Wu***, Jingbo Xu. Association Rules with Graph Patterns. *The 41th International Conference on Very Large Data Bases* (**VLDB**), 2015.

C.20   Predrag T.Tosic, **Yinghui Wu**. Towards networks of search engines and other digital experts: a distributed intelligence approach. *IEEE International Conference on U-and E-Service Science and Technology*, 2015.

C.21   Bo Zong, **Yinghui Wu**, Jie Song, Ambuj Singh, Hasan Cam, Jiawei Han, Xifeng Yan. Towards Scalable Critical Alert Mining. *The 20th International Conference on Knowledge Discovery and Data Mining* (**KDD**), 2014.

C.22   **Yinghui Wu**, Shengqi Yang, Xifeng Yan. Summarizing Answer Graphs Induced by Keyword Queries. *The 40th International Conference on Very Large Data Bases* (**VLDB**), 2014.

C.23 Wenfei Fan, Xin Wang, **Yinghui Wu**, Deng Dong. Distributed Graph Simulation:Impossibility and Possibility.*The 40th International Conference on Very Large Data Bases*(**VLDB**), 2014.

C.24   Shengqi Yang, **Yinghui Wu**, Huan Sun, Xifeng Yan. Schemaless and Structureless Graph Querying. *The 40th International Conference on Very Large Data Bases* (**VLDB**), 2014.

C.25   Shengqi Yang, Yanan Xie, **Yinghui Wu**, Tianyu Wu, Huan Sun, Jian Wu, Xifeng Yan. SLQ: A User-friendly Graph Querying System, *ACM SIGMOD Conference on Management of Data* (**SIGMOD**), 2014

C.26   Wenfei Fan, Xin Wang, **Yinghui Wu***. Querying Big Graphs within Bounded Resources. *ACM SIGMOD Conference on Management of Data* (**SIGMOD**), 2014

C.27   Wenfei Fan, Xin Wang, **Yinghui Wu***. Answering Graph Pattern Queries Using Views. *International Conference on Data Engineering* (**ICDE**), 2014. **Best Paper Runner-up**

C.28   Wenfei Fan, Xin Wang, **Yinghui Wu***. Diversified Top-K Graph Pattern Matching. *The 40th International Conference on Very Large Data Bases* (**VLDB**), 2014.

C.29   **Yinghui Wu**, Shengqi Yang, Xifeng Yan. Ontology-based Subgraph Querying. *International Conference on Data Engineering* (**ICDE**), 2013. **Best Poster Award**

C.30   Arijit Khan, **Yinghui Wu**, Charu Aggarwal, Xifeng Yan. NeMa: Fast Graph Search with Label Similarity. *The 39th International Conference on Very Large Data Bases* (**VLDB**), 2013.

C.31   Wenfei Fan, Xin Wang, **Yinghui Wu***. ExpFinder: Finding Experts by Graph Pattern Matching. *International Conference on Data Engineering* (**ICDE**), 2013.

C.32   Wenfei Fan, Xin Wang, **Yinghui Wu***. Performance Guarantees for Distributed Reachability Queries. *The 38th International Conference on Very Large Data Bases* (**VLDB**), 2012.

C.33   Bo Zong, **Yinghui Wu**, Ambuj Singh, Xifeng Yan. Inferring the Underlying Structure of Information Cascades. *International Conference on Data Mining* (**ICDM**), 2012.

C.34   Arijit Khan, **Yinghui Wu**, Xifeng Yan. Emerging Graph Queries in Linked Data. *International Conference on Data Engineering* (**ICDE**), 2012.

C.35   Wenfei Fan, Jianzhong Li, Xin Wang, **Yinghui Wu***. Querying Preserving Graph Compression. *ACM SIGMOD Conference on Management of Data* (**SIGMOD**), 2012

C.36   Wenfei Fan, Jianzhong Li, Jizhou Luo, Zijing Tan, Xin Wang, **Yinghui Wu***. Incremental Graph Pattern Matching. *ACM SIGMOD Conference on Management of Data* (**SIGMOD**), 2011.

C.37 Wenfei Fan, Jianzhong Li,Shuai Ma,Nan Tang,**Yinghui Wu***. Adding Regular Expressions to Graph Reachability and Pattern Queries.*International Conference on Data Engineering* (**ICDE**),2011.

C.38   Wenfei Fan, Jianzhong Li, Shuai Ma, Nan Tang, **Yinghui Wu***, Yunpeng Wu. Graph Pattern Matching: From Intractable to Polynomial Time. *The 36th International Conference on Very Large Data Bases* (**VLDB**), 2010.

C.39   Ting Deng, Wenfei Fan, Leonid Libkin, **Yinghui Wu***. On the Aggregation Problem for Synthesized Web Services. *The 13th International conference on Database Theory* (**ICDT**), 2010.

C.40   Wenfei Fan, Shuai Ma,Yanli Hu,Jie Liu, **Yinghui Wu***.Propagating Functional Dependencies with Conditions.*The 34th International Conference on Very Large Data Bases*(**VLDB**), 2008.

Workshop Papers

W.1   Mohammad Hossein Namaki*, Keyvan Sasani*, **Yinghui Wu**, Assefaw Gebremedhin. Performance Prediction for Graph Queries. *Network Data Analytics at SIGMOD* (**NDA**), 2017.

W.2   Qi Song*, Mohammad Hossein Namaki*, Peng Lin*, **Yinghui Wu** Parallel Graph Summarization for Knowledge Search. *Mining and Learning with Graphs at KDD* (**MLG**), 2017.

Book Chapters

B.1   **Yinghui Wu**, Arijit Khan. Graph Pattern Matching. Book chapter in *Encyclopedia of Big Data Technologies*, Sakr, Sherif, Zomaya, Albert (Eds.), Springer, 2018

B.2   Davide Mottin, **Yinghui Wu**. Graph Exploration and Search. Book chapter in *Encyclopedia of Big Data Technologies*, Sakr, Sherif, Zomaya, Albert (Eds.), Springer, 2018

PATENTS	Yinghui Wu, Mohammad Hossen Namaki, and Xin Zhang. "Quality-aware keyword query suggestion and evaluation." US Application 62/780,926, filed December 17, 2018.
	Wenfei Fan, Xin Wang, Yinghui Wu, and Jingbo Xu. "Method and apparatus for association rules with graph patterns." US Application 15/018,294, filed August 10, 2017.
	Wenfei Fan, Xin Wang, and Yinghui Wu. "Graph data search method and apparatus." U.S. Patent 9,798,774, issued October 24, 2017.

INVITED TALKS	Towards On-the-Fly Knowledge Bases for Electric Grid Resilience. *NSF Workshop on Real Time Data Analytics for the Power Grid Resiliency*, Portland, OR, Aug. 2018
	Ensemble-based Bad Data Detection in PMU Data Streams. *Workshop on Data Analytics for the Smart Grid, Pullman, WA*, Aug. 2017
	From Think Parallel to Think Sequential. *Pacific Northwest National Laboratory, Richland, WA*, Mar. 2018
	Answering Pattern Queries Using Views. *SIGMOD workshop on Network Data Analytics*, May. 2017
	Big Graph Analytics: A Journey of Scalability and Usability. *Pacific Northwest National Laboratory, Richland, WA*, Apr. 2015
	Big Graph Search and Analytics. *Northeast Univ., Jilin Univ., Beihang Univ., China*, Oct. 2014
	Optimizing Service Reachability Against Network Attacks, *Science for Cybersecurity (S4C) workshop, University of Maryland, College Park, MD*, Jun. 2013
	Ontology-based subgraph querying. *ICDE Workshop on Graph Data Management, Brisbane, Australia*, Apr. 2013
	Towards advanced search in complex graphs. *ICDE Workshop on Graph Data Management, Brisbane, Australia*, Apr. 2013
	Ontology-based subgraph querying. *ARL Network Science CTA Technical Meeting, University of Delaware, Newark, DE,* Apr. 2013
	Emerging Graph Queries in Linked Data. *ICDE Tutorial, Washington DC*, Apr. 2012

PROFESSIONAL SERVICE

Program Committee Member (Selected)

ACM **SIGMOD** International Conference on Management of Data	2015-2016, 2018-2019
ACM **SIGKDD** Conference on Knowledge Discovery and Data Mining	2015-2016,2018
International Conference on Very Large Data Bases (**VLDB**)	2013-2015,2017,2019
IEEE International Conference on Data Engineering (**ICDE**)	2014,2019
ACM Int'l Conf. on Information and Knowledge Management(**CIKM**)	2012-2013,2015,2017
IEEE International Conference on Data Mining (**ICDM**)	2015
International Conference on Extending Database Technology (**EDBT**)	2014,2017
International Conference on Web-Age Information management (**WAIM**)	2014-2016
Int'l Conf. on Database Systems for Advanced Applications (**DASFAA**)	2014-2015,2019
SIAM International Conference on Data Mining (**SDM**)	2015-2016

Conference Organization

Panelist, NSF Workshop on Smart Grids Big Data	2018
Session Chair, Workshop on Data Analytics for the Smart Grid	2017
Session Chair, IEEE International Conference on Data Engineering (ICDE)	2013

Journal Referee (Selected)

Journal of Computer and System Sciences, ACM Transactions on Database Systems, Distributed and Parallel Databases, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Knowledge and Data Engineering, Information System, VLDB Journal, WWW Journal

Grant Review Panel

National Science Foundation	2014,2017
Department of Homeland Security Center of Excellence	2017
Hong Kong Research Grants Council, China	2018

Memberships in Professional Organizations

Member, Association for Computing Machinery (ACM)

Member, Institute for Electrical and Electronics Engineers (IEEE)

Ph.D. Students

Hanchao Ma	Fall '17-Present
Sheng Guan	Fall '17-Present
Qi Song	Fall '15-Present
Mohammad Hossein Namaki	Fall '15-Present
Peng Lin	Fall '15-Present

M.S. Students

Sukhjinder Singh	Fall '17-Present
Arman Ahmad	Fall '17-Present
Xin Zhang	Spring '17-Fall '18
Keyvan Sasani	Fall '16-Fall '18
Giridhar Monoharan	Fall '16-Spring '18
Mengze Zhou	2015-2017
Mohammed Saad Liaqat (Univ. of Edinburgh)	2010-2012
Yi Zhang (Univ. of Edinburgh)	2010-2012

Undergraduate Students

Evan McElheny (Marist Colledge, NSF REU)	Summer 2018
Casey Fleck (Coastal Carolina University, NSF REU)	Summer 2017
Jialiang Shen (Beijing University of Posts and Telecommunications)	Summer 2017
Shayan Monadjemi (University of Texas Dallas, NSF REU)	Summer 2016
Rebecca Baumher (University of Pennsylvania, NSF REU)	Summer 2015

Visiting Scholars

Ling Xiong (Professor, Wuhan University of Science and Technology)	Fall 2018 - Summer 2019
Hui Sun (Associate Professor, Renmin University)	Fall 2016 - Fall 2017

Dissertation Committee

Lei Cai (Ph.D., TAMU, 2018-), Xuanming Liu (Ph.D., Univ. of Massachusetts Lowell, 2018), Yuchao Ma (Ph.D., WSU, 2017), Armen Abnousi (Ph.D., WSU, 2016), Priyanka Ghosh (Ph.D., WSU, 2015), Pascal Schmitt (M.S., Univ. of Edinburgh, 2011).

Ph.D. Qualify Exam Committee

Lei Cai (2018), Xuanming Liu (2018), Christopher Pereyda (Chair, 2018), Sumit Purohit (2018), Yuchao Ma (2017), Beiyu Lin (2018), Marco Minutoli (2018), Yue Zhang (2017), Qi Song (2016), Mohammad H. Namaki (2016), Peng Lin (2016), Armen Abnousi (2016), Priyanka Ghosh (2016)

University Services

Graduate Studies Committee, School of EECS, Washington State Univ.	2017-Present
Faculty Research Mentor, Louis Stokes Alliances for Minority Participation.	2017-Present