XUEQING LIU

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EDUCATION

Doctor of Philosophy in Computer Science **July 2019 (expected)**
University of Illinois at Urbana-Champaign Urbana, IL, USA
Advisors: Prof. ChengXiang Zhai Aug 2012-present
Prof. Tao Xie June 2016-present

Bachelor of Science, Computer Science **July 2012**
Tsinghua University Beijing, China
Tsinghua Xuetang Special Pilot CS Class (Directed by Prof. Andrew Yao)

RESEARCH INTERESTS

My research interests include software engineering, security, information retrieval, and data mining. My dissertation research focuses on helping end users with their decision-making tasks by recommending supportive information using information retrieval techniques.

REPRESENTATIVE PUBLICATIONS

Xueqing Liu, ChengXiang Zhai, Wei Han, Onur Gungor. "Numerical Facet Range Partition: Evaluation Metric and Methods". *in Proceedings of the International Conference on World Wide Web Companion (WWW 2017), Industry Track*, Perth, Australia, April 2017

Xueqing Liu, Yue Leng, Wei Yang, ChengXiang Zhai and Tao Xie. "Mining Android App Description for Permission Requirements Recommendation". *in Proceedings of the 26th International Requirement Engineering Conference (RE 2018)*, Banff, Canada, August 2018

Xueqing Liu, Yue Leng, Wei Yang, Wenyu Wang, ChengXiang Zhai and Tao Xie. "An Empirical Study on Android Runtime Permission Rationales". *in Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018)*, Lisbon, Portugal, October 2018

RESEARCH EXPERIENCE

Projects as the Lead Contributor

Synthesis of Code from Natural Language
University of Illinois Urbana-Champaign *2018-Present*

Explaining Android Permission Purpose to Users
University of Illinois Urbana-Champaign *2016-Present*
- Design statistical analysis for large-scale permission-explanation messages from Android apps
- Identify potential security vulnerabilities in existing permission-explanation messages [12]

◦ Design and implement a recommender system [11] to support app developers with the task of explaining permission requests

e-Commerce Product Search
@WalmartLabs and University of Illinois Urbana-Champaign *2015-2016*
◦ Propose a novel numerical optimization problem [7] in e-Commerce search
◦ Derive a lower-bound approximation with optimization in time complexity
◦ Reduce users' browsing cost by 25%

Stack Overflow Questions Retrieval
University of Illinois Urbana-Champaign *2015-Present*
◦ Propose and investigate the evaluation methodology on a dataset LinkSO [10] for learning to rank Stack Overflow questions

Bing News Recommender System
Microsoft Research *5/2014-8/2014*
◦ Discover the user fatigue phenomenon in a news recommender system
◦ Propose features that improve Bing news's ranking performance by 15% and 34% (frequent users) [6]

Automatic Taxonomy Construction from Keywords
Microsoft Research Asia *2011-2012*
◦ Design and implement an LSH-based hierarchical clustering algorithm [1] to speed up the automatic construction of taxonomy for large keyword corpus

Projects with Major Contributions

Interactive Construction of Hierarchical Topic Models
University of Illinois Urbana-Champaign *2014-2015*
◦ Help with implementing the optimized version of moment-based topic inference algorithms
◦ Help with implementing a toolkit [5] for supporting human corrections in hierarchical moment-based topic inference algorithm

Evaluating Interactive Information Retrieval
University of Illinois Urbana-Champaign *2017*
◦ Help with implementing a user behavior simulator for evaluating interactive information retrieval

PUBLICATIONS

Security and Software Engineering

[12] **Xueqing Liu**, Yue Leng, Wei Yang, Wenyu Wang, ChengXiang Zhai and Tao Xie. "An Empirical Study on Android Runtime Permission Rationales". *in Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018)*, Lisbon, Portugal, October 2018

[11] **Xueqing Liu**, Yue Leng, Wei Yang, ChengXiang Zhai and Tao Xie. "Mining Android App Description for Permission Requirements Recommendation". *in Proceedings of the 26th International Requirement Engineering Conference (RE 2018)*, Banff, Canada, August 2018

Acceptance rate = 22.2%

[10] **Xueqing Liu**, Chi Wang, Yue Leng, ChengXiang Zhai. "LinkSO: A Dataset for Learning to Retrieve Similar Question Answer Pairs on Software Development Forums". *in Proceedings of the ACM SIGSOFT International Workshop on NLP for Software Engineering (NL4SE@FSE 18)*, Lake Buena Vista, Florida, November 2018

[9] Jiayi Cao, Angello Astorga, Siwakorn Srisakaokul, Zhengkai Wu, **Xueqing Liu**, Xusheng Xiao, and Tao Xie. "Visualizing Path Exploration to Assist Problem Diagnosis for Structural Test Generation". *in Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018), Posters*, Lisbon, Portugal, October 2018

Web Search / Information Retrieval

[8] Yinan Zhang, **Xueqing Liu** and ChengXiang Zhai. "Information Retrieval Evaluation as Search Simulation: A General Formal Framework for IR Evaluation". *in Proceedings of the ACM SIGIR International Conference on the Theory of Information Retrieval (ICTIR 2017)*, Amsterdam, Netherlands, October 2017

[7] **Xueqing Liu**, ChengXiang Zhai, Wei Han, Onur Gungor. "Numerical Facet Range Partition: Evaluation Metric and Methods". *in Proceedings of the International Conference on World Wide Web Companion (WWW 2017)*, *Industry Track*, Perth, Australia, April 2017
Acceptance ratio = 19.6%

[6] Hao Ma, **Xueqing Liu**, Zhihong Shen. "User Fatigue in Online News Recommendation". *in Proceedings of the International Conference on World Wide Web Companion (WWW 2016). Industry Track*, Montreal, Canada, April 2016
Acceptance ratio = 17.3%

Text Mining

[5] Chi Wang, **Xueqing Liu**, Yanglei Song, Jiawei Han. "Towards Interactive Construction of Topical Hierarchy: A Recursive Tensor Decomposition Approach". *in Proceedings of the ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2015)*, Sydney, Australia, August 2015
Acceptance ratio = 19.5%

[4] Yangqiu Song, Shixia Liu, **Xueqing Liu**, Haixun Wang. "Automatic Taxonomy Construction from Keywords via Scalable Bayesian Rose Trees". *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, February 2015

[3] Chi Wang, **Xueqing Liu**, Yanglei Song, Jiawei Han. "Scalable Moment-based Inference for Latent Dirichlet Allocation". *in Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD 2014)*, Nancy, France, September 2014

[2] Chi Wang, **Xueqing Liu**, Yanglei Song, Jiawei Han. "Scalable Exact Inference for Topic Model". *Workshop on Method of Moments and Spectral Learning (@ICML 2014)*, Beijing, China, June 2014

[1] **Xueqing Liu**, Yangqiu Song, Shixia Liu, Haixun Wang. "Automatic Taxonomy Construction from Keywords". *in Proceedings of the ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2012)*, Beijing, China, August 2012

Acceptance ratio = 17.6%, Citation to date = 109

TEACHING EXPERIENCE

Teaching Assistant
University of Illinois Urbana-Champaign

- **CS 510: Advanced Information Retrieval (Graduate-Level Course)** Fall 2018
  - One of 2 TAs for 90 students
  - Design assignment problems and rubrics, grading and answering questions
  - Propose and mentor 2 new research topics
  - Mentor 20 teams' final projects

- **CS 410: Text Information System (Undergraduate-Level Course)** Spring 2015
  - One of 5 TAs for 200 students
  - Design a clustering method for project team assignment

- **CS 598: Special Topics in Information Retrieval (Graduate-Level Course)** Fall 2014
  - One of 2 TAs for 45 students
  - Grade assignments and answer questions

PROFESSIONAL ACTIVITIES

Organizer of TIMAN research seminar Fall 2018

Subreviewer: CCS 2018, NACCL-HLT 2018, TKDE 2016, TOIS 2014

PRESENTATIONS

Apps, Trackers, Privacy, and Regulators
Paper presentation in CS563 Advanced Computer Security

An Empirical Study on Android Runtime Permission Rationales
VL/HCC 2018, Lisbon, Portugal

Mining Android App Description for Permission Requirements Recommendation
RE 2018, Banff, Canada

Numerical Facet Range Partition: Evaluation Metric and Methods
WWW 2017, Perth, Australia

AWARDS

NSF Travel Grant for VL/HCC 2018

NSF Travel Grant for RE 2018

UIUC Graduate College Conference Travel Grant, UIUC 2017

Huang Yicong Scholarship, Tsinghua University (1 out of 33 in Yao Class) 2011

High School Math League, China, **provincial first price** 2007

Girls' Math Olympic, China, **silver medal** 2006

INDUSTRIAL INTERNSHIP EXPERIENCE

@WalmartLabs Sunnyvale, CA, USA

- *Summer Research Intern, Search Team* 5/2015-8/2015
- *Part-time Research Intern (remote), Search Team* 8/2014-5/2015
- Mentors: Anjan Goswami and Dr. Wei Han

Microsoft Research Remond, WA, USA

- *Summer Research Intern, ISRC* 5/2014-8/2014
- Mentor: Dr. Hao Ma

Microsoft Research Asia Beijing, China

- *Research Intern* 4/2011-5/2012
- Mentors: Dr. Shixia Liu (now associate professor at Tsinghua University)
  Dr. Yangqiu Song (now assistant professor at HKUST)

REFERENCES

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