

## Qingyao Ai

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College of Information and Computer Sciences  
University of Massachusetts Amherst  
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### RESEARCH INTERESTS

Information Retrieval, Learning to Rank, Question Answering, Domain-specific Search, Recommendation, Deep Learning, User Behavior Analysis

### EDUCATION

09/2014 - present

**University of Massachusetts Amherst**, Amherst, MA

Ph.D. Program, Computer Science. Advisor: W. Bruce Croft

M.S., Computer Science. GPA: 4.0/4.0

09/2010 - 07/2014

**Tsinghua University**, Beijing, China

B.S., Computer Science. GPA: 3.82/4.0

### RESEARCH EXPERIENCE

05/2018 - 08/2018

**Amazon A9**, Palo Alto, CA

Research Intern – Mentor: Daniel N. Hill, S. V. N. Vishwanathan

06/2017 - 09/2017

**Google Research**, Mountain View, CA

Research Intern – Mentor: Xuanhui Wang, Nadav Golbandi, Mike Bendersky

06/2015 - 09/2015

**Microsoft Research**, Redmond, WA

Research Intern – Mentor: Susan Dumais, Nick Craswell

09/2014 - present

**University of Massachusetts Amherst**, Amherst, MA

Research Assistant – Advisor: W. Bruce Croft

01/2014 - 07/2014

**Tsinghua University**, Beijing, China

Undergraduate Thesis – Advisor: Yiqun Liu

### TEACHING EXPERIENCE

**UMass CS646: Information Retrieval**

Fall 2018

Lecturer and Teaching Assistant

Fall 2016

Guest Lecturer

**UMass CS691RS: Introduction to Recommender Systems**

Spring 2017

Guest Lecturer

### PEER-REVIEWED PUBLICATIONS

Citation count 444, h-index 11, i10-index 13 in *Google Scholar*

CONFERENCE  
PROCEEDINGS

Yongfeng Zhang, Xu Chen, **Qingyao Ai**, Liu Yang, W. Bruce Croft. Towards Conversational Search and Recommendation: System Ask, User Respond. In Proceedings of CIKM'18: *The Conference on Information and Knowledge Management*, Lingotto, Turin, Italy, October 22-26, 2018.

**Qingyao Ai**, Keping Bi, Jiafeng Guo, W. Bruce Croft. Learning a Deep Listwise Context Model for Ranking Refinement. In *Proceedings of SIGIR'18: ACM SIGIR Conference on Research and Development in Information Retrieval*, Ann Arbor, Michigan, USA, July 8-12, 2018. Cited by 5.

**Qingyao Ai**, Keping Bi, Cheng Luo, Jiafeng Guo, W. Bruce Croft. Unbiased Learning to Rank with Unbiased Propensity Estimation. In *Proceedings of SIGIR'18: ACM SIGIR Conference on Research and Development in Information Retrieval*, Ann Arbor, Michigan, USA, July 8-12, 2018. Cited by 6.

**Qingyao Ai**, Brendan O'Connor, W. Bruce Croft. A Neural Passage Model for Ad-hoc Document Retrieval. In *Proceedings of ECIR'18: The European Conference on Information Retrieval*, Grenoble, France, March 26-29, 2018

**Qingyao Ai\***, Yongfeng Zhang\*, Xu Chen and W. Bruce Croft. Joint representation learning for top-n recommendation with heterogeneous information sources. In *Proceedings of CIKM'17: The Conference on Information and Knowledge Management*, Singapore, November 6-10, 2017. Cited by 26.

Xu Chen, Yongfeng Zhang, **Qingyao Ai**, Hongteng Xu, Junchi Yan and Zheng Qin. Personalized Key Frame Recommendation. In *Proceedings of SIGIR'17: ACM SIGIR Conference on Research and Development in Information Retrieval*, Japan, Tokyo, August 7-11, 2017. Cited by 25.

**Qingyao Ai**, Hamed Zamani, Stephen Harding, Shahrzad Naseri, James Allan, W. Bruce Croft. UMass at TREC'17 Common Core Track. In *Proceedings of TREC'18 Text Retrieval Conference 2018*

**Qingyao Ai**, Yongfeng Zhang, Keping Bi, Xu Chen and W. Bruce Croft. Learning a Hierarchical Embedding Model for Personalized Product Search. In *Proceedings of SIGIR'17: ACM SIGIR Conference on Research and Development in Information Retrieval*, Japan, Tokyo, August 7-11, 2017. Cited by 19.

**Qingyao Ai**, Susan T. Dumais, Nick Craswell, and Dan Liebling. Characterizing Email Search using Large-scale Behavioral Logs and Surveys. In *Proceedings of WWW'17: The Web Conference*, Australia, Perth, April 3-7, 2017. Cited by 12.

Narang, Kanika, Susan T. Dumais, Nick Craswell, Dan Liebling, and **Qingyao Ai**. Large-Scale Analysis of Email Search and Organizational Strategies. In *Proceedings of CHIIR'17: ACM SIGIR Conference on Human Information Interaction and Retrieval*, Oslo, Norway, March 7-11, 2017. Cited by 10.

Jiafeng Guo, Yixing Fan, **Qingyao Ai**, W. Bruce Croft. Semantic Matching by Non-Linear Word Transportation for Information Retrieval. In *Proceedings of CIKM'16: The Conference on Information and Knowledge Management*, Indianapolis, USA. October 24-28, 2016. Cited by 30.

Liu Yang, **Qingyao Ai**, Jiafeng Guo, W. Bruce Croft. aNMM: Ranking Short Answer Texts with Attention-Based Neural Matching Model. In *Proceedings*

of CIKM'16: *The Conference on Information and Knowledge Management*, Indianapolis, IN, USA. October 24-28, 2016. Cited by 49.

Jiafeng Guo, Yixing Fan, **Qingyao Ai**, W. Bruce Croft. A Deep Relevance Matching Model for Ad-hoc Retrieval. In Proceedings of CIKM'16: *The Conference on Information and Knowledge Management*, Indianapolis, USA. October 24-28, 2016. Cited by 151.

**Qingyao Ai**, Liu Yang, Jiafeng Guo, and W. Bruce Croft. Analysis of the Paragraph Vector Model for Information Retrieval. In Proceedings of ICTIR'16: *ACM SIGIR International Conference on the Theory of Information Retrieval*, Newark, DE, USA, September 12-16, 2016. Cited by 38.

**Qingyao Ai**, Liu Yang, Jiafeng Guo, and W. Bruce Croft. Improving Language Estimation with the Paragraph Vector Model for Ad-hoc Retrieval. In Proceedings of SIGIR'16: *ACM SIGIR Conference on Research and Development in Information Retrieval*, Pisa, Italy, 2016. Cited by 20.

Liu Yang, **Qingyao Ai**, Damiano Spina, Ruey-Cheng Chen, Liang Pang, W. Bruce Croft, Jiafeng Guo, and Falk Scholer. Beyond Factoid QA: Effective Methods for Non-factoid Answer Sentence Retrieval. In Proceedings of ECIR'16: *The European Conference on Information Retrieval*, Padova, Italy, March 20-23, 2016. Cited by 26.

**Qingyao Ai\***, Lee Chia-Jung\*, W. Bruce Croft, and Daniel Sheldon. An Optimization Framework for Merging Multiple Result Lists. In Proceedings of CIKM'15: *The Conference on Information and Knowledge Management*, Melbourne, Australia. Cited by 11.

#### JOURNAL ARTICLES

**Qingyao Ai**, Vahid Azizi, Xu Chen, Yongfeng Zhang. Learning Heterogeneous Knowledge Base Embeddings for Explainable Recommendation. *Algorithms, Special Issue Collaborative Filtering and Recommender Systems* 2018, 11(9)

Zeyang Liu, Jiaxin Mao, Chao Wang, **Qingyao Ai**, Yiqun Liu, and Jian-Yun Nie. Enhancing click models with mouse movement information. In *Information Retrieval Journal*, 2017. Cited by 4.

#### WORKSHOP PAPERS

Cohen Daniel, **Qingyao Ai** and W. Bruce Croft, Adaptability of Neural Networks on Varying Granularity IR Tasks. In Proceedings of SIGIR'16: *ACM SIGIR Conference on Research and Development in Information Retrieval, NeuIR Workshop*, Pisa, Italy, July 17-21, 2016. Cited by 10.

\* indicates equal contributions.

#### INVITED TALKS

##### **Towards Deep Intelligent Information Retrieval**

09/2018

Alibaba Inc., Beijing, China

##### **Unbiased Learning to Rank with Unbiased Propensity Estimation**

06/2018

Amazon A9, Palo Alto, CA

- Deep Representation Learning for Product Search and Recommendation**  
 03/2018 Amazon A9, Palo Alto, CA  
 03/2018 Google Research, Mountain View, CA
- Characterizing Email Search using Large-scale Behavioral Logs**  
 06/2017 Google Research, Mountain View, CA
- Hierarchical Embedding for Personalized Product Search**  
 05/2017 Chinese Academy of Sciences, Beijing, China  
 05/2017 Tsinghua University, Beijing, China
- A Deep Relevance Matching Model for Ad-hoc Retrieval**  
 11/2016 Tsinghua University, Beijing, China

## AWARDS AND HONORS

- 11/2017 Gift from Amazon A9 (\$60,000), UMass Amherst  
 10/2017 UMass CICS Accomplishments in Search&Mining Awards, UMass Amherst  
 12/2016 Ph.D. Qualifying Exam (Portfolio) passed with distinction, UMass Amherst  
 07/2014 Outstanding Bachelor Graduate of Beijing, Tsinghua University  
 07/2014 Outstanding Bachelor Graduate of Tsinghua, Tsinghua University  
 06/2014 Excellent Graduate Thesis Award, Tsinghua University  
 05/2014 Tsinghua Laboratory Contribution Award, Tsinghua University  
 10/2012 Zhong Shi-Mo Fellowship, Tsinghua University  
 10/2011 Friends of Tsinghua-SAMCHANG Fellowship, Tsinghua University

## ACADEMIC SERVICE

### Tutorial Tutor

*Unbiased Learning to Rank: Theory and Practice*. ICTIR'18, CIKM'18

### Workshop co-Chair

*The 1st Workshop on Deep Matching in Practical Applications*. WSDM'19

### Program Committee Member

SIGIR'17, CIKM'17, SIGIR'18, EARS'18, CIKM'18, RecSys'18, AIRS'18, CCL'18, WWW'19, ECIR'19

### Journal Reviewer

Transactions on Information Systems (TOIS), IEEE Transactions on Knowledge and Data Engineering (TKDE)

## REFERENCES

### **W. Bruce Croft**

Distinguished Professor, ACM Fellow

*College of Information and Computer Sciences, University of Massachusetts  
Amherst*

croft[at]cs.umass.edu

### **Susan Dumais**

Distinguished Scientist, Managing Deputy Director, ACM Fellow

*Microsoft Research AI, Redmond*

sdumais[at]microsoft.com

### **Jiafeng Guo**

Professor

*Institute of Computing Technology, Chinese Academy of Sciences*

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### **Yiqun Liu**

Associate Professor, Department Co-Chair

*Department of Computer Science and Technology, Tsinghua University*

yiqunliu[at]tsinghua.edu.cn

### **Xuanhui Wang**

Staff Software Engineer

*Google AI*

xuanhui[at]google.com