

# SIGIR 2018 Workshop on Explainable Recommendation and Search (EARS 2018)

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## ABSTRACT

Explainable recommendation and search attempt to develop models or methods that not only generate high-quality recommendation or search results, but also intuitive explanations of the results for users or system designers, which can help to improve the system transparency, persuasiveness, trustworthiness, and effectiveness, etc. This is even more important in *personalized* search and recommendation scenarios, where users would like to know why a particular product, web page, news report, or friend suggestion exists in his or her own search and recommendation lists. The workshop focuses on the research and application of explainable recommendation and search, and gathers researchers as well as practitioners in the field for discussions, idea communications, and research promotions.

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## 1 MOTIVATION AND APPROPRIATENESS

The motivation of the workshop is to promote the research and application of *Explainable Recommendation and Search*, under the background of *Explainable AI* in a more general sense. Early recommendation and search systems adopted intuitive yet easily explainable models to generate recommendation and search lists, such as user-based and item-based collaborative filtering for recommendation, which provide recommendations based on similar users or items, or TF-IDF based retrieval models for search, which provide document ranking lists according to word similarity between different documents.

However, state-of-the-art recommendation and search models extensively rely on complex machine learning and latent representation models such as matrix factorization or even deep neural networks, and they work with various types of information sources such as ratings, text, images, audio or video signals. The complexity nature of state-of-the-art models make search and recommendation

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systems as blank-boxes for end users, and the lack of explainability weakens the persuasiveness and trustworthiness of the system for users, making explainable recommendation and search important research issues to the IR community.

In a broader sense, researchers in the whole artificial intelligence community have also realized the importance of Explainable AI, which aims to address a wide range of AI explainability problems in deep learning, computer vision, automatic driving systems, and natural language processing tasks. As an important branch of AI research, this further highlights the importance and urgency for our IR/RecSys community to address the explainability issues of various recommendation and search systems.

## 2 THEME AND PURPOSE

The purpose of the workshop is to gather researchers and practitioners of recommendation and search systems to communicate the latest ideas and research achievements on explainable recommendation and search, discuss about the advantages and disadvantages of existing approaches, and share the ideas of future directions of recommendation and search in the explanation perspective. Based on this workshop, we would not only like to present the latest research achievements, but also connect researchers in the community that are interested in the explainable recommendation and search topic to promote this direction in the following years.

The main themes and topics of the workshop include but are not limited to:

- **New Models for Explainable Recommendation and Search**
  - Explainable shallow models
  - Explainable neural models
  - Explainable sequential modeling
  - Explainable optimization theories
  - Causal inference for explainable analysis
- **Different Information Sources for Explanation**
  - Text-based modeling and explanation
  - Image-based modeling and explanation
  - Using knowledge-base for explanation
  - Audio-based modeling and explanation
  - Video-based modeling and explanation
  - Integrating heterogenous information for explanation
- **User Behavior Analysis and HCI for Explanation**
  - Explanation and user satisfaction
  - Mouse movement analysis
  - Eye tracking and attention modeling
- **New Types of Explanations**
  - Textual sentence explanations
  - Visual explanations
  - Statistic-based explanations

- Aggregated explanations
- Context-aware explanations
- **Evaluation of Explainable Recommendation and Search**
  - Offline evaluation measures and protocols
  - Online evaluation measures and protocols
  - User study for explanation evaluation
- **New Applications**
  - Explainable product recommendation and search
  - Explainable social recommendation and search
  - Explainable news recommendation and search
  - Explainable POI recommendation and search
  - Explainable multimedia recommendation and search

### 3 FORMAT AND PLANED ACTIVITIES

The workshop intends to be a half day workshop with a keynote speech, several paper presentations, and a poster session to give researchers opportunity for extensive discussions. The tentative schedule of events include:

- An industry keynote speech to highlight the importance of explainable recommendation and search in real-world system and business.
- A mixture of 5 to 10 long and short paper presentations.
- A poster session for researchers to communicate and make discussions extensively.

### 4 INDUSTRY KEYNOTE

**Title:** Shakespeare of Alibaba: Practice of Intelligent Recommendation Reason Generation in Alibaba.

**Abstract:** Explainable recommendation and search is a very promising topic in both academia and industry in the recent years. There are many human generated recommendation reasons for products in Alibaba Taobao to improve user experience and to increase user stickiness. However, relying on human-generated content will result in low coverage, low quality stability, and high financial expenditure. With the rapid development of deep learning technology in NLP, especially in the nature language generation field, we tried natural language generation approach in recommendation reason generation and achieved good results. We created recommendation reasons for auction and auction list, which covered millions of product categories in Taobao e-commerce, and the generated explanations were used for large-scale real-world transactions in “2017 Double 11 Shopping Festival” without any manual checking. Industry-level real system experiments show that it was very difficult to distinguish whether the explanations are machine-generated or manually-written, and the content generation can be controlled in multiple dimensions such as text style, text length, topics, etc. We will introduce our solution and technical details about generating free-text explanations in this keynote.

**Bio:** Dr. Qingsong Hua has been working in Alibaba search algorithm team since 2013 and has led a lot of projects about search relevance, quality, and conversion effectiveness. He is responsible for the intelligent recommendation reason generation project, which won the biggest Alibaba technical award in “2017 Double 11

Online Shopping Festival”. He is now responsible for the overall international search algorithm team in Alibaba.

### 5 SUBMISSION AND SELECTION PROCESS

The workshop accepts both long and short papers. The maximum length of long paper is 9 pages (plus up to 1 page of references). Each accepted long paper is presented in a plenary session, and is allocated a presentation slot in a poster session to encourage discussion and follow up between authors and attendees. The maximum length of short paper is 4 pages (plus up to 1 page of references). Each accepted short paper is presented in a spot-light session, and is also allocated a presentation slot in a poster session to encourage discussion and follow up between authors and attendees. The review process is double blind.

### 6 ORGANIZERS

Biography of the organizers and their main research experience related to the proposed workshop topic are as follows.

**Yongfeng Zhang** is an Assistant Professor in the Department of Computer Science at Rutgers University (The State University of New Jersey). His research interest is in Recommendation and Search Systems, Economic Data Science, and Conversational Systems. In the previous he was a postdoc in the Center for Intelligent Information Retrieval (CIIR) at UMass Amherst, and did his PhD and BE in Computer Science at Tsinghua University, with a BS in Economics at Peking University. He is a Siebel Scholar of the class 2015, and a Baidu Scholar of the class 2014. Together with coauthors, he formally introduced the concept of Explainable Recommendation in SIGIR 2014 [8], and has been consistently working on explainable recommendation and search models thereafter [1–7, 9]. His recent work on explainability of search and recommendation models include visually explainable recommendation, knowledge base embedding for explainable recommendation, natural language generation for explainable recommendation, as well as explainable product search in e-commerce.

**Yi Zhang** is a professor in the School of Engineering, University of California Santa Cruz. Her research interests include large scale information retrieval, recommendation systems, internet advertising, data mining, natural language processing, and applied machine learning. She has published chapters, journal articles, and papers at top conferences in these areas, such ACM SIGIR, WWW, CIKM, IEEE ICDM, ICML, COLINGS, HLT. She received NSF Faculty Early Career Award in 2010, an Air Force Research Young Investigator Award in 2008, the Best Paper Award at ACM SIGIR in 2002, and several other awards. Her Information Retrieval and Knowledge Management Lab is doing research sponsored by several government agencies and companies (Microsoft, Yahoo, Google, NEC, Bosch, Nokia etc.). She has served as a consultant or technical advisor for companies. She regularly serves on the program committees of the very best conferences in her research areas. She has served as area chair or senior PC member at ACM SIGIR, EMNLP, and ACM Recommender Systems. She has served as conference co-chair in charge of Information Retrieval area at the ACM Conference on Information and Knowledge Management, and tutorial chair for ACM

SIGIR. She is serving as an associate editor for ACM Transaction on Information Systems. Dr. Zhang received her Ph.D. from School of Computer Science at Carnegie Mellon University, specializing in Language and Information Technologies.

**Min Zhang** is an associate professor in the Department of Computer Science and Technology (DCST), Tsinghua University. She received her Bachelor and PhD degrees from DCST at Tsinghua University in 1999 and 2003, respectively. During the past years, she has visited DFKI Germany, City University of HongKong, Kyoto University, and MSRA as visiting researcher. Dr. Zhang specializes in information retrieval, Web user behavior analysis and machine learning. She has published more than 100 papers on important international journals and conferences, such as JASIST, JIR, SIGIR, WWW, WSDM, CIKM, etc. She has participated in TREC (Text REtrieval Conference) benchmarks as the team leader since 2002. Her team has continuously achieved multiple top performances during 10 years. She also contributed in INTENT tasks in NTCIR evaluation as task co-organizer from 2011 to 2013. Dr. Zhang served as PC chair at WSDM 2017, as well as area chairs or senior PC members at CIKM and AIRS, and PC members at SIGIR, WWW, WSDM, KDD, ACL, etc. Currently she is also the executive director of Tsinghua University-Microsoft Research Asia Joint Research Lab on Media and Search, and the vice director of Tsinghua-Sohu Joint Research Lab of Search Technology.

## 7 PROGRAM COMMITTEE MEMBERS

The following researchers act as the program committee members of the workshop:

- Behnoush Abdollahi, University of Louisville
- Qingyao Ai, University of Massachusetts Amherst
- Rose Catherine, Carnegie Mellon University
- Xu Chen, Tsinghua University
- Michael Ekstrand, Boise State University

- Ruining He, Pinterest
- Xiangnan He, National University of Singapore
- Bart Knijnenburg, Clemson University
- Aonghus Lawlor, University College Dublin
- Piji Li, The Chinese University of Hong Kong
- Julian McAuley, University of California San Diego
- Sole Pera, Boise State University
- Zhaochun Ren, JD Data Science Lab
- Sungyong Seo, University of Southern California
- Xiang Wang, National University of Singapore
- Yao Wu, Twitter Inc
- Hamed Zamani, University of Massachusetts Amherst

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