

Workshop on Context-Aware Recommender Systems

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ABSTRACT

Contextual information has been widely recognized as an important modeling dimension both in social sciences and in computing. In particular, the role of context has been recognized in enhancing recommendation results and retrieval performance. While a substantial amount of existing research has focused on context-aware recommender systems (CARS), many interesting problems remain under-explored. The CARS 2020 workshop provides a venue for presenting and discussing approaches for the next generation of CARS and application domains that may require the use of novel types of contextual information and cope with their dynamic properties in online environments.

CCS CONCEPTS

• **Information systems** → **Recommender systems; Location based services**; • **Computing methodologies** → **Learning latent representations; Neural networks**.

KEYWORDS

Context-Aware Recommendation; Context; Contextual Modeling; Sequence-Aware Recommendation

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1 INTRODUCTION

Contextual information has been widely recognized as an important modeling dimension in various social science and technological disciplines and is becoming more and more important for enhancing recommendation results and retrieval performance [6]. While a substantial amount of research has been performed to date, many existing approaches to context-aware recommender systems (CARS)

focus on the so-called ‘representational view’ that incorporates pre-defined and static contextual factors in the recommendation process, such as the activity of the user, time, location, and weather. There have been several CARS workshops organized in the past where the addition of contextual information to traditional recommender systems has been discussed, including the CARS workshop series (2009-2012, 2019) organized in conjunction with RecSys [1–3, 5, 8], and the CARR (context-aware retrieval and recommendation) workshop series (2011-2014) organized in conjunction with IUI, WSDM, and ECIR [11–14, 20].

Although most of the CARS literature has focused on the representational approach, which suggests modeling context using a set of observable attributes that are known a priori, relevant contextual attributes may not be known in advance in many CARS applications and, therefore, need to be discovered [4, 7]. Discovering other types of contextual information from multiple types of data (semantic web, graphs) and media (text, images, video, speech) can subsequently be used for providing better recommendations. For example, the utilization of user reviews to discover contextual information [10] can be used to enhance recommendations. In addition, the relevance of each contextual dimension for user preferences could be dependent on the particular contextual state, hence creating a dynamic model of context [9, 18].

Recent research has shown that modeling context using latent factors may address the contextual data sparsity and the high dimensionality of typical contextual models challenges. In the past few years, various new CARS techniques have been introduced, such as sequence-aware recommender systems [19] and latent context-aware recommender systems [22, 23]. For example, latent context-aware recommender systems [22] utilize unsupervised learning techniques for modeling implicit contextual information derived from mobile devices. Other recent studies [16, 18, 21] have shown that sequential contextual information can improve recommendation accuracy, since sequences enable modeling of both the long- and short-term preferences of the user. Moreover, inferring implicit contexts in real-time (online) environments [15] and measuring business metrics [17] for multiple new application areas, such as education, health, cooperative work, and affective computing, require modeling of complex, partially observable and dynamic contextual factors.

Hence, the primary goal of the CARS workshop is to focus on CARS-related topics, methodologies, and applications and broadly discuss the main features of the next generation of CARS and application domains that may require the use of novel types of contextual

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information and cope with their dynamic properties in online environments. In this respect, the main challenge of the next CARS generation is to introduce more explainable, flexible, and comprehensive approaches to modeling and using contextual information. We also aim to bring together researchers with wide-ranging backgrounds to identify important research questions in this area, to exchange ideas from different research disciplines, and, more generally, to facilitate discussion and innovation in the area of the next generation of context-aware recommender systems.

2 WORKSHOP FORMAT AND TOPICS

CARS workshop is organized as an interactive, half-day workshop. The workshop includes keynote presentations from academia and industry with the goal of sharing their latest results and identifying new trends and challenges across the following topics: context in decision making, models for latent context, and human context recognition for health applications. The second half of the workshop includes paper sessions, where accepted submissions are presented and discussed.

The paper submissions are reviewed by the workshop program committee, which select the most interesting works that meet the objectives of the workshop for the oral presentations. Evaluation criteria for acceptance include relevance to the workshop, novelty, significance for theory and/or practice, and quality of exposition. The proceedings will be made available online from the workshop website. Finally, time permitting, the workshop plans to include an open discussion panel to promote and facilitate future research and foster interaction with the participants.

Relevant topics for the CARS workshop include:

- Sequence-aware recommender systems
- Latent context-aware recommender systems
- Mobile recommender systems and wearables
- Human context recognition for health applications
- Online context-aware recommender systems
- Context-aware user modeling for recommender systems
- Data sets for context-dependent recommendations
- Algorithms for detecting the relevance of contextual data from multiple types of data (semantic web, graphs) and media (text, images, video, speech)
- Explainable context-aware recommender systems
- Large-scale context-aware recommender systems
- Evaluation of context-aware recommender systems
- Context in decision making

3 WORKSHOP SUBMISSIONS

A total of 8 papers were submitted to the workshop, which were evaluated by the program committee of international experts in the field. These papers focused on a wide range of topics in context-aware recommendations, including: dynamic representations of context in CARS, such as sequences, leveraging information from multiple sources for context-aware recommendations, prediction of purchase intent with session-based models, and time-aware recommendations.

4 WEBSITE AND PROCEEDINGS

The workshop material (list of accepted papers, invited talks, and the workshop schedule) can be found on the CARS workshop website at <https://cars-workshop.com>. The proceedings will be made available online from the workshop website. A summary of the workshop will appear in SIGIR Forum to increase cross-disciplinary awareness of recommender systems research.

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