

MORS 2021:

1st Workshop on Multi-Objective Recommender Systems

Himan Abdollahpouri
himan.abdollahpouri@northwestern.edu
Northwestern University
Evanston, IL, United States

Shaghayegh Sahebi
ssahebi@albany.edu
State University of New York –
Albany
United States

Mehdi Elahi
mehdi.elahi@uib.no
University of Bergen
Bergen, Norway

Zahra Nazari
zahran@spotify.com
Spotify
New York City, New York, United
States

Babak Loni
babak.loni@gmail.com
ING Group
Amsterdam, Netherlands

Masoud Mansoury
m.mansoury@uva.nl
University of Amsterdam
Amsterdam, Netherlands

Allison Chaney
ajb.chaney@duke.edu
Duke University
Durham, North Carolina, United
States

ABSTRACT

Historically, the main criterion for a successful recommender system was the relevance of the recommended items to the user. In other words, the only objective for the recommendation algorithm was to learn user's preferences for different items and generate recommendations accordingly. However, real-world recommender systems are well beyond a simple objective and often need to take into account multiple objectives simultaneously. These objectives can be either from the users' perspective or they could come from other stakeholders such as item providers or any party that could be impacted by the recommendations. Such multi-objective and multi-stakeholder recommenders present unique challenges and these challenges were the focus of the MORS workshop.

KEYWORDS

multi-objective recommendation, Value-aware recommendation

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1 WORKSHOP DESCRIPTION

Recommender systems are software tools that are used in a variety of application domains supporting users to find relevant items, products, and services easier. Historically, the main criterion for a

successful recommender system was the relevance of the recommended items to the user. In other words, the only objective for the recommendation algorithm was to learn user's preferences for different items and generate recommendations accordingly. However, real-world recommender systems are well beyond a simple objective and often take into account multiple objectives. Indeed, different objectives can be important and should be considered for generating the recommendations. These objectives can be either from the users' perspective or they could come from other stakeholders such as item providers and the ones that could be impacted by the recommendations.

From the users' perspective, often multiple objectives need to be considered for generating the recommendations. For example, in restaurant recommendations, several factors should be taken into account, such as users' taste, diet restrictions, the proximity of the restaurant, and price. Each of these considerations may be important, but to varying degrees and with heterogeneity between customers. Therefore, it is crucial for a recommender system to incorporate all these different objectives into account when recommending restaurants to a user. Similarly, in the education domain, a student may prefer working on simpler problems to achieve higher scores. However, students need to be challenged to learn; as a result, a system that recommends practice problems should balance student preferences with utility for learning. Objectives may also come from stakeholders such as the item providers (e.g., content creators), platform owners, or even society. For example, on a music streaming service, the platform may want to balance the multiple interests of the listeners (enjoyment), artists (exposure), and the platform as a company (revenue). These types of objectives and considerations exist in many other domains including social media, transportation, news recommendation, and food recommendation.

The MORS workshop encouraged submissions addressing the challenges of producing recommendations in multi-objective and multi-stakeholder settings, including but not limited to the following topics:

- Recommender systems with multiple objectives

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- Value-aware recommendation (profit, value, purpose, etc.)
- Trade-off between relevance and bias in recommender systems
- Recommendation with multiple stakeholders
- Food recommendation with different objectives
- Group recommender systems
- Conflict handling in multi-stakeholder recommendation
- Fairness-aware recommender systems
- Balancing the long-term impacts of the recommendations and the users' short term preferences
- News recommendation with editorial values
- Educational recommender systems with multiple, potentially conflicting, objectives
- Personalized medicine with the different objectives coming from the patients and physicians

The MORS 2021 workshop was a continuation of the discussion of these topics in prior RecSys workshops including Value-Aware and Multistakeholder Recommendation (VAMS 2017 [2]), and Workshop on Recommendation in Multi-stakeholder Environments (RMSE 2019 [1])

2 WORKSHOP ORGANIZERS

The workshop organizers were as follows:

Himan Abdollahpouri (Northwestern University, United States)

Himan Abdollahpouri is a postdoctoral fellow at the Spiegel Research Center at Northwestern University.

Mehdi Elahi (University of Bergen, Norway)

Mehdi Elahi is an Associate Professor at University of Bergen (UiB), Department of the Information Science & Media Studies (InfoMedia).

Masoud Mansoury (Eindhoven University of Technology, Netherlands)

Masoud Mansoury is a PhD student in the Department of Mathematics and Computer Science at Eindhoven University of Technology, Netherlands.

Shaghayegh (Sherry) Sahebi (University at Albany – SUNY, United States)

Sherry Sahebi is an assistant professor of Computer Science at the University At Albany – SUNY and the founder of Personalized AI (PersAI) Lab.

Zahra Nazari (Spotify, United States)

Zahra Nazari is a senior research scientist at Spotify.

Allison Chaney (Duke University, United States)

Allison Chaney is an Assistant Professor of Business Administration (Marketing) and Computer Science at Duke University.

Babak Loni (ING group)

Babak Loni is a Machine Learning Engineer at ING group.

3 PROGRAM COMMITTEE

MORS 2021 followed a peer review process for paper acceptance. At least two program committee members reviewed each submission. The following is a list of academic and industry researchers that helped the workshop in the review process:

- Robin Burke, University of Colorado, Boulder
- Dietmar Jannac, Alpen-Adria-Universität Klagenfurt
- Toshihiro Kamishim, National Institute of Advanced Industrial Science and Technology (AIST)
- Elisabeth Lex, Graz University of Technology
- Yue Shi, Facebook
- Massimo Quadrana, Pandora Media
- Marko Tkalcic, University of Primorska
- Konstantin Bauman, Temple University
- Cataldo Musto, University of Bari
- Dominik Kowald, Know-Center
- Mesut Kaya, Aalborg University Copenhagen
- Ludovico Boratto, Eurecat
- Thanh-Nam Doan, University of Tennessee at Chattanooga
- Danielle Lee, Chung-Ang University
- Kun Lin, DePaul University
- Farshad B. Moghaddam, University of Bonn
- Soude Fazeli, Delft University of Technology
- Peter Knees, Vienna University of Technology
- Mirko Marras, EPFL

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REFERENCES

- [1] Robin Burke, Himan Abdollahpouri, Edward C Malthouse, KP Thai, and Yongfeng Zhang. 2019. Recommendation in multistakeholder environments. In *Proceedings of the 13th ACM Conference on Recommender Systems*. 566–567.
- [2] Robin Burke, Gediminas Adomavicius, Ido Guy, Jan Krasnodebski, Luiz Pizzato, Yi Zhang, and Himan Abdollahpouri. 2017. Vams 2017: Workshop on value-aware and multistakeholder recommendation. In *Proceedings of the Eleventh ACM Conference on Recommender Systems*. 378–379.