

# Explanations and User Control in Recommender Systems (Extended Abstract)

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## CCS CONCEPTS

• **Information systems** → **Recommender systems**; *Collaborative filtering*; • **Human-centered computing** → *Human computer interaction (HCI)*.

## KEYWORDS

Recommender Systems, Decision Support Systems, Explanations

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## 1 BACKGROUND

The personalized selection and presentation of content have become common in today's online world, for example on media streaming sites, e-commerce shops, and social networks. This automated personalization is often accomplished by recommender systems, which continuously collect and interpret information about the individual user. To determine which information items should be presented, these systems typically rely on machine learning.

Over the last decades, a large variety of machine learning techniques of increasing complexity have been applied for building recommender systems. The recommendation models that are learned by such modern algorithms are, however, usually seen as black boxes. Technically, they often consist of values for hundreds or thousands of variables, making it impossible to provide a human-understandable rationale why a certain item is recommended to a particular user.

Providing users with an *explanation* or at least with an intuition why an item is recommended can, however, be crucial, both for the acceptance of an individual recommendation and for the establishment of user *trust* towards the system as a whole [3]. Furthermore, such system-provided explanations can not only contribute to the acceptance of the system, but also serve as entry points for interactive approaches that allow users to give feedback as a means to correct system assumptions and, thus, take *control* of the recommendation process.

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The chapter "Explanations and User Control in Recommender Systems" [4] in Augstein et al.'s book entitled "Personalized Human-Computer Interaction" [1] discusses these topics in more detail.

## 2 EXPLAINING RECOMMENDATIONS

The role of explanations in the context of recommender systems has been studied for several years (see [2, 7, 8] for recent surveys). In this chapter, we first provide a comprehensive list of potential *purposes* of explanations mentioned in the literature. The list comprises the concepts of transparency, effectiveness, trust, persuasiveness, satisfaction, education, scrutability, efficiency, and debugging. Furthermore, we discuss which types of *content*, e.g., pro-and-con arguments or background knowledge, have been used in the literature to explain the system's suggestions to the user. Finally, we review typical challenges of explaining complex machine learning models and provide an example of how we can assess alternative explanation styles through a user study.

## 3 PUTTING THE USER INTO CONTROL

The second part of the chapter focuses on how users can be empowered to give feedback on their recommendations and how they can be provided with a mechanism to influence future recommendations. Following the taxonomy from [6] and the insights from [5], we discuss different ways of user interaction (i) during the *preference elicitation* phase and (ii) the *recommendation presentation phase*. As the literature and a survey among users of a deployed recommender system indicate, questions of appropriate user interface metaphors and low cognitive complexity are crucial for the acceptance of mechanisms for user control. These aspects, however, often seem not to be given sufficient emphasis in academic proposals.

## REFERENCES

- [1] Mirjam Augstein, Elco Herder, and Wolfgang Wörndl (Eds.). 2019. *Personalized Human-Computer Interaction*. De Gruyter.
- [2] Gerhard Friedrich and Markus Zanker. 2011. A Taxonomy for Generating Explanations in Recommender Systems. *AI Magazine* 32, 3 (2011), 90–98.
- [3] Jonathan L. Herlocker, Joseph A. Konstan, and John Riedl. 2000. Explaining Collaborative Filtering Recommendations. In *Proceedings CSCW '00*. 241–250.
- [4] Dietmar Jannach, Michael Jugovac, and Ingrid Nunes. 2019. *Personalized Human-Computer Interaction*. De Gruyter, Chapter Explanations and User Control in Recommender Systems.
- [5] Dietmar Jannach, Sidra Naveed, and Michael Jugovac. 2016. User Control in Recommender Systems: Overview and Interaction Challenges. In *Proceedings EC-Web '16*. 21–33.
- [6] Michael Jugovac and Dietmar Jannach. 2017. Interacting with Recommenders—Overview and Research Directions. *Transactions on Interactive Intelligent Systems* 7, 3 (2017), 10:1–10:46.
- [7] Ingrid Nunes and Dietmar Jannach. 2017. A Systematic Review and Taxonomy of Explanations in Decision Support and Recommender Systems. *User-Modeling and User-Adapted Interaction* 27, 3–5 (2017), 393–444.
- [8] Nava Tintarev and Judith Masthoff. 2011. Designing and Evaluating Explanations for Recommender Systems. In *Recommender Systems Handbook*, Francesco Ricci, Lior Rokach, Bracha Shapira, and Paul B. Kantor (Eds.). Springer US, 479–510.