



ACM Transactions on Recommender Systems

Special Issue on Deep Reinforcement Learning for Recommender Systems (DRL4RS)

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Recommender systems (RS) have been recognized as one of the most effective technologies to extract insightful information from user-item interaction data and to make appropriate recommendations to potential users accordingly. Such systems have been widely infused into intelligent decision-making processes in various domains. However, classical deep learning-based recommendation techniques (e.g., deep collaborative filtering, deep sequential models, etc.) can remain limited in terms of handling the inherent complexity of user-item interaction data and adapting to the dynamics of user interests incurred by distribution shift.

Deep reinforcement learning (DRL) has been introduced into RS by combining the power of deep learning and reinforcement learning. DRL can not only deal with complex user-item interaction data but also actively learn from users' real-time feedback to infer dynamic user preferences; therefore, DRL-based recommendation performance can be improved considerably. Despite this significant advancement, DRL-based RSs are still in their early stage and there are still various crucial challenges, e.g., sample inefficiency in DRL-based RS leading to slow convergence, inadequate reward functions for characterizing the short-term and long-term rewards, degradation of the user feedback loop, etc. Therefore, further enhancements of DRL-based methods are needed to achieve their full potential in addressing various concerns exists in such RS.

In addition to general DRL-based RS, DRL has been widely employed in some specific recommendation tasks including sequential/session-based recommendations, interactive recommendations, etc. DRL can be utilized to model the continuous user-system interactions to better learn the timely and dynamic preferences of users, and thus evolutionally optimize the recommendation strategies. In addition, the long-term effect/reward of users' historical records and current user-item interaction behaviors can be well modeled by DRL, leading to the long-term optimization of recommendation strategies.

This special issue focuses on the fundamental theories, algorithms, and applications of DRL-based RS. It aims to feature recent advances and future trends of advanced recommendation technologies with DRL from both academia and industry. It will promote the exploration of these new directions.

Topics

Potential topics include but are not limited to the following:

- Time-efficient sampling techniques for DRL-based RS
- Security, trust, and privacy in DRL-based RS
- DRL model training and adoption in real RS applications
- Sequential recommendation with DRL
- Interactive sequential recommendation based on DRL
- Efficient policy learning for large action spaces in DRL-based RS
- Whole-chain (multi-step) sequential recommendation based on DRL

- Intention-aware sequential recommendation with DRL
- Evolutionary preference learning for sequential recommendation with DRL
- Bias in DRL-based RS
- Explainability and interpretability of DRL-based recommendation results
- DRL-based RS with knowledge graphs
- Robustness on adversarial samples in DRL-based RS
- Few-shot and zero-shot DRL for RS
- Spatial-temporal DRL for context-aware RS
- Benchmark datasets or supporting platforms for DRL-based RS
- Causality in DRL-based RS

Important Dates

- Submissions deadline: August 31, 2023
- First-round review decisions: October 31, 2023
- Deadline for revision submissions: December 31, 2023
- Notification of final decisions: February 28, 2024

Submission Information

We accept research, survey, and perspective/opinion papers. Each paper should address one or more of the abovementioned topics or be in other scopes of DRL for RS. Submissions must be prepared according to the TORS submission guidelines (<https://dl.acm.org/journal/tors/author-guidelines>) and must be submitted via Manuscript Central (<https://mc.manuscriptcentral.com/tors>). The special issue will also consider extended versions (at least 30% new content) of papers published at conferences.

For questions and further information, please contact the guest editors at lianyongqi@gmail.com.