



# FinRec: The 3rd International Workshop on Personalization & Recommender Systems in Financial Services

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## ABSTRACT

The FinRec workshop series offers a central forum for the study and discussion of the domain-specific aspects, challenges, and opportunities of RecSys and other related technologies in the financial services domain. Six years after the second edition of the workshop, the recent advances in the area of personalization and recommendation in financial services fostered the need for a new workshop aiming at bringing together researchers and practitioners working in financial services-related areas. Accordingly, the third edition of the event aims to: (1) understand and discuss open research challenges, (2) provide an overview of existing technologies using recommender systems in the financial services domain, and (3) provide an interactive platform for information exchange between industry and academia.

## CCS CONCEPTS

• **Computing methodologies** → *Natural language processing; Machine learning*; • **Information systems** → *Personalization*; • **Applied computing** → *Multi-criterion optimization and decision-making*.

## KEYWORDS

recommender systems; financial services; joint optimization; stakeholders; personalization

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## 1 INTRODUCTION AND MOTIVATIONS

Personalization and recommendation technologies can broadly be defined as systems that aim to support users in decision making by suggesting and offering relevant content, and have been well-studied in a variety of domains, such as movies, music, and news. While the application of recommender systems and related technologies in the domain of financial services is less well-developed, there is a clear rising commercial interest around these technologies from companies and startups alike. Recently, financial-services firms have begun to use recommender systems to provide investor alerts about key market events in which they might be interested. According to a Bloomberg Business news report<sup>1</sup> on March 2015, funds run by intelligent agents now account for 400 billion US dollars.

At the same time, the use of AI applications in the financial services industry, such as recommender systems, is considered high-risk by the European Commission [4], as automation here can directly impact people's lives. In this light, the rise of AI-assisted decision-making in the financial services industry should be met with caution. Predatory loan targeting, for instance, is a commonly-used example application area in AI ethics and fairness literature [1–3].

We feel the prevalence and rise of personalization and recommender systems technology in financial services calls for a central forum where researchers and practitioners alike can study and discuss the domain-specific aspects, challenges, and opportunities of RecSys and other related technology. The aim of this workshop is to bring together researchers and practitioners working in financial services-related areas in order to: (1) understand and discuss open research challenges, (2) provide an overview of existing technologies using recommender systems in the financial services domain,

<sup>1</sup><https://www.bloomberg.com/news/articles/2015-03-16/smart-beta-etfs-attract-billions-with-critics-blaming-dumb-money>

and (3) provide an interactive platform for information exchange between industry and academia.

FinRec workshop features contributions that fall into the following two categories of domains or applications:

- Recommendation of financial products and/or services, such as loans, insurance plans, pension plans, real estate, funds and stocks, investment, micro-finance, etc. This includes related aspects, such as explanations, ethical aspects, multi-stakeholder fairness, and awareness and sustainability.
- Broadly speaking, we also welcome submissions related to more general industry perspectives (not limited to the financial industries), such as the joint optimizations between recommendation relevance and the profits, business strategies, the balance between costs and gains, the view from different stakeholders in the industries. For example, the topic of joint optimization between profits and relevance in any domains (e.g., movies, music, etc) would also be relevant for our workshop.

## 2 WORKSHOP HISTORY

The 1st **FinRec** workshop was organized at Graz, Austria in 2015<sup>2</sup>, and the 2nd **FinRec** workshop was successfully held in Bari, Italy in 2016<sup>3</sup>. We accepted 6 and 8 papers in the years 2015 and 2016, respectively. These accepted submissions had contributions in case-based reasoning, content-based and constraint-based recommendations, psychological perspectives of the financial recommendations, and so on.

Despite the success of these earlier editions, the need for a renewed third edition of FinRec can be motivated in the light of the following reasons:

- The research on recommender systems and related technology for financial services is still in its infancy.
- The previous **FinRec** workshops were held in 2015 and 2016. Nowadays, the development of relevant techniques in the area of recommender systems enables more research topics and more potential solutions in these FinRec areas, such as the development of joint optimizations, the notion of multiple stakeholders, multi-task learning, AutoML, and the practice of multi-task and multi-objective learning in the industries, etc.
- The upcoming EU regulatory framework proposal on AI, in which AI systems for the financial services industry are considered high-risk applications [4], represent another novel challenge that deserves to be highlighted at the workshop.
- The topic of AI for financial services and recommender systems has become increasingly popular in recent years. For instance, there is a FinTech track<sup>4</sup> at the IJCAI-2020 conference, and there is a decent number of submissions in this track this year. This shows the ongoing popularity of this topic.

## 3 TOPICS OF INTEREST

- **Recommendation opportunities**

<sup>2</sup><http://ceur-ws.org/Vol-1349/>

<sup>3</sup><http://ceur-ws.org/Vol-1606/>

<sup>4</sup><https://www.ijcai20.org/call-for-papers-fintech.html>

- Financial management
- Portfolio optimization
- Investment
- Insurance
- Relevance, Cost & Profits
- Loan and lending
- Micro-finance
- **Research problems in FinTech RecSys**
  - Recommender systems in Big Data in finance.
  - FinTech AI enhanced RecSys
  - Similarity, novelty and diversity
  - Customer segmentation for RecSys
  - Loan recommendation
  - Multi objective FinTech RecSys
  - Multi stakeholder RecSys
  - Metrics and evaluations
- **Recommender Systems**
  - Traditional Recommender Systems (Collaborative filtering, content-based, hybrid, etc)
  - Context-aware Recommender Systems
  - Multi-Criteria Recommender Systems
  - Group Recommender Systems
  - Cross-Domain Recommender Systems
  - Multi-Stakeholder Recommender Systems
  - Multi-Task Recommender Systems
- **User Modeling and Interfaces**
  - Preference detection
  - Portfolio management
  - New Interface or Visualizations
  - Explanation of recommendations
  - Decision Biases
  - Privacy and risks
  - FAT (fairness, accountability, and transparency)

## 4 KEYNOTE

The workshop will also feature a keynote presentation given by Dr. Qian Zhao. Qian Zhao is a team lead in Bloomberg's AI Engineering group, which is responsible for building financial solutions using technologies from Machine Learning, Natural Language Processing, Dialog Understanding, Graph Analytics, Time Series Analysis, Information Retrieval, Recommendation Systems, Speech Recognition, Computer Vision, and Optimization. Some of the products the AI Group helps build include News, Research, Communications, and Finance.

Moreover, Qian has actively served the research community as the Proceedings Co-Chair of RecSys'22, a Senior Program Committee member of RecSys'21, the Associate Chair of CSCW'20, and as a Program Committee member for TheWebConf, SIGIR, WSDM, and other top academic conferences.

## 5 WORKSHOP MATERIALS

The workshop material (list of accepted papers, keynote, and the workshop schedule) will be found on the FinRec 2022 workshop website at <https://finrecsys.github.io/>.

The proceedings will be available as a dedicated volume in an open repository (e.g. CEUR-WS or PMLR).

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