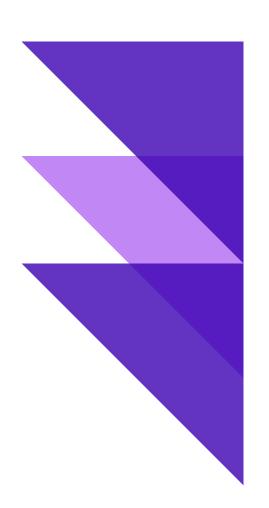


# The 6th International Workshop on Health Recommender Systems

Organizers:
Hanna Hauptman,
Christoph Trattner,
Helma Torkamaan



October 18, 2024

Bari, Italy





Copyright© 2024 for the individual papers by the papers' authors.

Copyright  $\bigcirc$  2024 for the volume as a collection by its editors.

This volume and its papers are published under the Creative Commons License Attribution 4.0 International (CC BY 4.0).

### **Preface**

Launched in 2016, the Health Recommender Systems Workshop (HealthRecSys), quickly became a pivotal forum for discussing the transformative potential of personalized recommender systems within the health and care sectors. This annual full-day event has successfully fostered a vibrant community of researchers, sparking engaging discussions on leveraging technology for beneficial health outcomes while emphasizing ethical practices in such a sensitive field. These discussions not only facilitated easier exchanges but also highlighted the workshop's role in fostering responsible technological advancements. The HealthRecSys workshop is discussing multiple fields in which recommender systems can improve well-being, health, care, and self-awareness. The use of recommender systems in the health domain gives a new perspective to current discussions and challenges of recommender systems, including how to involve users in the recommendation process, as well as the need to account for crucial aspects of trust and privacy.

Following the five previous workshops, the focus of this workshop is to intensify the discussion on health promotion, health information, health care, as well as health-related methods. This workshop also aims to strengthen the HealthRecSys community, engage representatives of health domains in cross-domain collaborations, and exchange and share infrastructure. This volume contains the papers presented at the 6th international workshop on health recommender systems on October 18, 2024, held as part of the 18th ACM Conference on Recommender Systems. Following a peer review process with two to four reviewers per paper, 13 papers were accepted for presentation at the workshop.

The 2024 submissions covered a diverse range of health-related goals, data types, algorithms, and subdomains. The topics addressed included contextual data, physical activity, autism, public health, clinical trials, food systems, infection suppression, patient metadata, and personalized healthcare. In addition, the submissions explored the intersection of health with advanced technologies, such as generative AI, large language models, and health-aware recommendation systems. Themes of equity, privacy, and ethics in health recommenders were emphasized, along with human / expert-in-the-loop personalization, adaptive systems, behavioral interventions, and persuasion. Other critical topics included privacy and security concerns, data management, integration with electronic health records, user compliance, drug recommendation systems, and mobile health applications.

The HealthRecSys chairs would like to thank the authors, presenters, and PC members whose efforts were integral to the success of the workshop. They also thank the ACM RecSys 2024 organizing committee, especially the workshop chairs for their support.

October, 2024

Hanna Hauptmann Christoph Trattner Helma Torkamaan

## Organizing Committee

Hanna Hauptmann University of Utrecht, the Netherlands

Christoph Trattner University of Bergen, Norway

Helma Torkamaan Delft University of Technology, the Netherlands

### **Program Committee**

Alejandro Bellogin University of Madrid, Spain Arianna Boldi Università di Torino, Italy Ludovico Boratto University of Cagliari, Italy Ine Coppens University of Ghent, Belgium

Robin DeCroon KU Leuve, Belgium
Carlos de Lannoy TU Delft, the Netherlands
Allegra DeFilippo University of Bologna, Italy
Gaetano Dibenedetto University of Bari, Italy

Angelo Geninatti Cossatin University of Torino, Italy
Morgan Harvey The University of Sheffield, United Kingdom

Eelco Herder Utrecht University, the Netherlands
Anita Honka Firstbeat Analytics/Garmin, Finland

Santiago Hors-Fraile Adhera Health, Spain

Anastasiia Klimashevskaia University of Bergen, Norway

Elisabeth Lex Graz University of Technology, Austria Bernd Ludwig University of Regensburg, Germany

Noemi Mauro

Cataldo Musto

Marco Polignano

Miguel Angel Portaz Collado

Olga Santos

University of Bari, Italy

University of Bari, Italy

UNED. Madrid, Spain

UNED. Madrid, Spain

Lukas Schulze Balhorn

TU Delft, the Netherlands

Alessandro Silacci University of Lausanne, Switzerland Alain Starke University of Amsterdam, the Netherlands

Panagiotis Symeonidis University of the Aegean, Greece Martin Wiesner Heilbronn University, Germany

Martijn Willemsen Eindhoven University of Technology, the Netherlands

# **Table of Contents**

| Keynote: Healthy and Sustainable Food Recommendations Exploiting Natural Language Processing and Large Language Models                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tailoring Health: Contextual Variables In Health Recommender Systems                                                                                                                   |
| Explaining Decision-Making between Exploration and Repetition: Key Factors for Physical Activity Recommendations                                                                       |
| Personalized Music Recommendation for People with Autism Spectrum Disorder15-17<br>Liliana Ardissono, Federica Cena and Noemi Mauro                                                    |
| Recommending News Articles for Public Health Intelligence                                                                                                                              |
| Improving the prediction of individual engagement in recommendations using cognitive models                                                                                            |
| Advancing Visual Food Attractiveness Predictions for Healthy Food Recommender Systems 34-39  Ayoub El Majjodi, Sohail Ahmed Khan, Alain D. Starke, Mehdi Elahi and Christoph  Trattner |
| Position Paper: Towards Recommender System Supported Contact Tracing for Cost-Efficient and Risk Aware Infection Suppression                                                           |
| Enriching Clinical Sample Analysis with Biological Knowledge Graphs: A Preliminary Study                                                                                               |
| Prompting Large Language Models for Tailored Exercise Recommendations in Office Spaces                                                                                                 |
| Enhancing Health Recommendations through Patient Metadata Integration: A  Persona-Based Evaluation Approach                                                                            |
| Personalizing Exercise Recommendations with Explanations using Multi-Armed Contextual Bandit and Reinforcement Learning                                                                |
| Health Document Presentation in Patient-Centered Recommender Systems with Carousel Interfaces                                                                                          |

| Design and Assessment of Representative Hybrid Clinical Trials using Health |    |
|-----------------------------------------------------------------------------|----|
| Recommender System                                                          | 82 |
| Nafis Neehal. Vibha Anand and Kristin P. Bennett                            |    |