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DOI
10.1145/3746252.3761596

Publication date
2025

Document Version
Final published version

Published in
CIKM 2025 - Proceedings of the 34th ACM International Conference on Information and Knowledge Management

Recommender Systems for Sustainable Development through Responsible Nudging

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Abstract

Recommender Systems (RS) influence everyday decisions, yet most remain optimized for short-term engagement or commercial gain. RS4SD aims to shift this focus by exploring how RS can contribute to sustainable development through behavioral change and nudging strategies. Aligned with the UN Sustainable Development Goals (SDG), RS4SD will highlight applications that promote responsible consumption, sustainable mobility, healthy eating, and digital well-being. In particular, we will focus on how AI and RS can be designed to foster sustainable behaviors through multi-objective optimization and ethically aligned interventions. These objectives are directly tied to the UN SDG, and we welcome all contributions showcasing RS in support of these goals.

A central theme of the workshop is the integration of behavioral science and AI to design interventions that guide users toward more sustainable and healthier choices while preserving individual autonomy. Topics of interest include multi-objective recommendation, health-aware RS, eco-friendly product and tourism RS, as well as novel evaluation metrics that go beyond accuracy to capture societal impact. RS4SD will bring together researchers, stakeholders and practitioners from RS, AI, sustainability, and behavioral science to share models, datasets, frameworks, and real-world use cases. The workshop encourages interdisciplinary collaboration and aims to build a community dedicated to responsible, behavior-aware RS that benefit both individuals and society.

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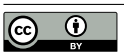

CIKM '25, Seoul, Republic of Korea

ACM ISBN 979-8-4007-2040-6/2025/11
https://doi.org/10.1145/3746252.3761596

CCS Concepts

• **Information systems** → **Personalization**; • **Human-centered computing** → **Collaborative and social computing systems and tools**.

Keywords

Recommender Systems, Responsible Nudging, Sustainable Development, Behavioral Change, Responsible AI

ACM Reference Format:
Mehrdad Rostami, Alexander Felfernig, Wolfgang Wörndl, Mourad Oussalah, Avishek Anand, Mahdi Jalili, and Ashmi Banerjee. 2025. Recommender Systems for Sustainable Development through Responsible Nudging. In *Proceedings of the 34th ACM International Conference on Information and Knowledge Management (CIKM '25), November 10–14, 2025, Seoul, Republic of Korea.* ACM, New York, NY, USA, 4 pages. https://doi.org/10.1145/3746252.3761596

1 Objectives, Theme, and Expected Outcomes

The Recommender Systems for Sustainable Development through Responsible Nudging (RS4SD) workshop explores how recommender systems (RS) can be designed and deployed to contribute to sustainable development [5], responsible consumption [8], and long-term societal well-being [1]. Building on the intersection of RS, behavioral science, and responsible AI, the workshop emphasizes behavior-aware and ethically aligned personalization frameworks that go beyond short-term engagement. It aims to provide a platform for presenting cutting-edge research, discussing challenges, and fostering collaborations across academia, industry, and policy.

The goal of RS4SD is to foster interdisciplinary collaboration and advance the development of responsible recommender systems that support the Sustainable Development Agenda [1], public health, and positive behavior change. The workshop emphasizes behavior-aware and ethically aligned AI systems that optimize for multiple objectives beyond user satisfaction alone. It seeks to:

[1] https://sdgs.un.org/2030agenda

- Bring together researchers and practitioners from RS, behavioral science, sustainability, health, and AI ethics
- Explore how behavioral nudging and AI-driven interventions can drive meaningful changes in user behavior without compromising autonomy
- Discuss state-of-the-art techniques in multi-objective RS and user-centric AI
- Introduce novel metrics and benchmarks for evaluating impact beyond engagement, including behavioral effectiveness and societal value
- Showcase real-world systems and use cases from both academia and industry

Expected outcomes include a curated selection of peer-reviewed papers, an expert panel discussion, and the launch of collaborative initiatives. To support long-term impact, we plan to create a mailing list, share workshop highlights, explore a special journal issue, and promote shared benchmarks and datasets to foster ongoing collaboration. In addition, a wrap-up session focused on producing a shared position paper or agenda on Responsible Nudging in AI could serve as a valuable output for shaping future research directions.

The main themes and topics of RS4SD are as follows:

- Recommender Systems aligned with the UN Sustainable Development Goals (SDGs) [9]
- Multi-objective RS: balancing user preferences with sustainability, health, and societal impact [6]
- Behavior-aware RS: integrating behavioral modeling, nudging strategies, and digital interventions [7]
- Responsible and ethically aligned personalization frameworks [11]
- Domain-specific RS for Sustainability: health-aware food recommendation, eco-conscious consumption, and sustainable travel/mobility (e.g., green product RS, low-carbon tourism) [2]
- Generative AI and LLM-powered explainable RS for behavior influence and social good [4]
- Evaluation metrics beyond accuracy: behavior change, long-term value, environmental and ethical impact [3]
- Real-world case studies and industrial applications in food, mobility, health, and e-commerce
- Energy-efficient RS models: developing recommendation algorithms that minimize computational cost and energy consumption to reduce the carbon footprint of AI systems and support environmental sustainability [10].

2 Relevance and Audience

RS4SD aligns strongly with CIKM's mission to advance research at the intersection of information retrieval, machine learning, and knowledge management. It directly supports the 2025 theme of responsible and impactful AI by addressing how RS can be designed not only for utility and engagement but also for long-term societal benefit. As digital platforms increasingly shape health behaviors, consumption choices, and sustainability outcomes, there is an urgent need for systems that integrate behavioral science, nudging strategies, and ethical personalization. RS4SD addresses this gap by focusing on multi-objective recommendation frameworks that optimize for relevance, fairness, sustainability, and behavioral impact. The workshop provides a timely and interdisciplinary forum for researchers and practitioners committed to building behavior-aware, responsible RS that align with public good.

The workshop targets researchers, practitioners, and students working in RS, responsible AI, sustainability, behavioral science, and digital health. It is especially relevant for those interested in designing AI-driven systems that promote long-term societal impact, ethical personalization, and behavior change. The expected number of attendees is 20–40.

3 Program Format and Schedule

RS4SD is a half-day workshop, with at least four Organizers/PC members attending and managing the event in person. The workshop will follow an engaging and interactive structure designed to encourage participation and community-building. The tentative schedule is shown in Table 1.

Table 1: Tentative half-day program schedule for RS4SD.

Time	Activity
09:00–09:15	Welcome and Introduction
09:15–10:00	Opening **Keynote**: *"Future Health: Responsible Multimodal Health Recommender Systems Powered by GenAI"*
10:00–11:00	**Session 1:** Paper Presentations (4 short papers, 10 mins + 5 mins Q&A each)
11:00–11:15	Coffee Break + Posters / Demos
11:15–11:45	Panel Discussion: *"Can RS Truly Drive Behavioral Change and Sustainability?"*
11:45–12:15	**Session 2:** Interactive Group Breakout – Designing SDG-Aware RS Evaluation Metrics
12:15–12:30	Closing Remarks + Best Paper Award + Next Steps

The interactive group session is designed to engage participants in small teams to sketch out key challenges and metrics in responsible RS, with summaries shared at the end. To increase visibility, we will actively promote the workshop through relevant communities including AI4SG, ACM RecSys, SIGIR, CHI, and digital health networks.

4 Related Workshops

Several recent workshops at CIKM and RecSys have addressed topics relevant to recommender systems, responsible AI, and sustainability. Table 2 summarizes the most closely related workshops and highlights how RS4SD differs in focus and scope.

While workshops such as *Trustworthy & Responsible AI* (CIKM 2024) and *RecSoGood* (RecSys 2024–25) touch on ethical aspects or sustainability, RS4SD is uniquely positioned to:

- Place behavioral science and nudging at the core of system design,
- Emphasize intervention effectiveness beyond accuracy or engagement,
- Bring together interdisciplinary communities from RS, behavioral science, public health, and sustainability,
- Encourage real-world deployment impact with case studies in food, tourism, and mobility, and
- Include interactive sessions to co-develop SDG-aware evaluation frameworks.

Table 2: Comparison with related workshops.

Workshop	Main Focus	How RS4SD Differs
Personalized Generative AI – CIKM 2023	Generative personalization using LLMs; early exploration of generative systems	Focuses on broad behavioral and societal outcomes through interventions and nudging, not just generative techniques
Recommendation with Generative Models – CIKM 2023	Algorithmic innovation in RS using generative architectures	Extends generative recommendation into ethical, health, and sustainability impact
KDAH: Analytics for Human Quality of Life – CIKM 2023	Neuro-symbolic & explainable AI to support well-being	Targets RS with behavioral nudging for health/sustainability
OARS: Online & Adaptive RS – CIKM 2024	Adaptive RS techniques, parameter tuning, real-time adaptation	Extends adaptivity into multi-objective ethical RS with behavior-change aims
Trustworthy & Responsible AI – CIKM 2024	Responsible AI in knowledge systems broadly	RS-specific focus, emphasizing responsible personalization with nudging and impact evaluation
GenAI & RAG for Enterprise – CIKM 2024	Enterprise-focused generative AI (LLMs + retrieval)	Focuses on societal applications (health, sustainability) rather than enterprise logistics
RecSoGood – ACM RecSys 2024–25	RS for sustainability and social good	Emphasizes behavioral change and responsible nudging; attracting a broader interdisciplinary audience

This clear positioning allows RS4SD to complement, rather than duplicate, related workshops, carving out a distinctive space at the intersection of personalization, behavior change, and societal benefit.

5 Organization and Review Process

Program Committee (tentative)

- Ali Rostami, University of California, Irvine, USA
- Ali Vardasbi, Spotify, Netherlands
- Amir M. Rahmani, University of California, Irvine, USA
- Anika, Gautam Buddha University, India
- Ashutosh Agarwal, Stevens Institute of Technology, USA
- Djamal Benslimane, Lyon 1 University, France
- Hosseinali Rahmani Dashti, University College London, UK
- Jarkko Saarinen, University of Oulu, Finland
- Kapil Kumar Reddy Poreddy, Walmart Global Tech, USA
- Parham Moradi, RMIT University, Australia
- Pantea Keikhosrokiani, University of Oulu, Finland
- Puneet Kumar, University of Oulu, Finland
- Seyed Mohssen Ghafari, Commonwealth Bank of Australia & Macquarie University, Sydney, Australia
- Siamak Seyfi, University of Oulu, Finland
- Venktesh Viswanathan, Delft University, Netherlands
- Yanming Liu, Zhejiang University, China

Participation and Selection Process

Papers will be selected through a peer-review process. Submissions will be managed via EasyChair, and each paper will be evaluated based on relevance, novelty, clarity, and potential impact. Accepted authors are required to present their work on-site.

Organizers' Background

- **Dr. Mehrdad Rostami**, Postdoctoral Researcher, University of Oulu, Finland. Specializes in recommender systems, AI-driven personalization, and user behavior modeling with a focus on sustainable and health-aware applications. His recent work centers on food recommender systems integrating nutritional analysis, user preferences, and behavioral interventions. He has authored multiple peer-reviewed publications at ECIR and ACM RecSys, addressing fairness, explainability, emotional insight, and LLM-based recipe recommendations. He also served as an organizer for the ELLIS Summer School on Information Retrieval 2024 at the University of Amsterdam.
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- **Dr. Alexander Felfernig**, Full Professor, Graz University of Technology, Austria. Leads the Applied Software Engineering & AI research group. His research spans recommender systems, sustainability, human decision-making, and knowledge-based configuration. He has co-authored foundational books on recommender systems and published extensively in venues such as IJCAI, AAAI, ACM RecSys, and AI Magazine. He has organized major conferences and workshops, including ACM RecSys and the International Workshop on Configuration.
  alexander.felfernig@tugraz.at
- **Dr. Avishek Anand**, Associate Professor, Delft University of Technology (TU Delft), Netherlands. Research interests include information retrieval, recommender systems, and explainable AI. He has published in SIGIR, WSDM, WWW, and ECIR, and co-organized tutorials on explainable IR and recommendation at SIGIR, FIRE, and ECIR. His work strongly aligns with sustainable and responsible AI.
  avishek.anand@tudelft.nl
- **Dr. Wolfgang Wörndl**, Senior Lecturer and Researcher, Technical University of Munich (TUM), Germany. Focuses on interactive recommender systems in mobile scenarios and has published over 100 refereed papers. He has co-organized the RecTour workshop series at ACM RecSys and served on numerous program committees.
  woerndl@cit.tum.de
- **Dr. Mourad Oussalah**, Full Professor, University of Oulu, Finland. Leads the Social Mining and NLP Research Group, bridging AI, health, NLP, and behavioral science. He has

organized several international conferences and workshops, including IEEE EISIC'19, and contributed to more than 120 program committees including ECIR, SIGIR, and RecSys. *mourad.oussalah@oulu.fi*

- **Dr. Mahdi Jalili**, Professor, RMIT University, Australia. Senior Member, IEEE, with over 10 years of research experience in recommender systems, machine learning, and network science. His work covers collaborative filtering, fairness, explainability, and graph neural networks. He has co-organized workshops (e.g., MaHIN at ASONAM 2018–2019) and served as PC member for ASONAM and EXPLAINABILITY. mahdi.jalili@rmit.edu.au
- **Ashmi Banerjee**, PhD candidate, Technical University of Munich (TUM), Germany. Google Developer Expert in Machine Learning (2023), with industry experience and awards including the Women Who Code Applaud Her Award. Her research focuses on sustainable tourism recommender systems, and she is active in promoting diversity in STEM as an ACM Women in RecSys advocate. *ashmi.banerjee@tum.de*

The organizers and PC members represent four continents (Europe, Asia, Australia, and North America) and bring together expertise from academia and industry across recommender systems, behavioral science, healthcare, responsible AI, and sustainability. This diversity will:

(1) Attract high-quality submissions from a broad research and practitioner base,
(2) Ensure rigorous, context-aware review processes,
(3) Foster cross-sector collaboration between technology, health, and sustainability communities, and
(4) Support global relevance by incorporating regionally diverse perspectives on behavioral interventions and SDGs.

A call for papers and submission guidelines will be published on the workshop website. We plan to offer a Best Paper Award and facilitate post-workshop collaboration through a mailing list or Slack workspace.

6 Submission Types and Key Dates

A broad range of contributions are welcomed to foster discussion and knowledge exchange within the community:

- **Full Research Papers** (up to 9 pages, excluding references): Original, mature research with validated results.
- **Short Papers / Work-in-Progress** (up to 6 pages, excluding references): Early-stage ideas, prototypes, or findings.
- **Vision / Position Papers** (4–6 pages, excluding references): Provocative ideas, future directions, or thought leadership.
- **Demo Papers** (up to 4 pages, excluding references): System prototypes, software tools, or datasets.
- **Extended Abstracts** (up to 2 pages, excluding references): Experience reports, novel concepts, or preliminary results. Prior or concurrently submitted work may be accepted in this category (non-archival).

Important Dates:

- Paper Submission Deadline: **September 15, 2025**
- Notification to Authors: **September 30, 2025**
- Camera-ready Due: **October 5, 2025**
- Workshop Date: **November 14, 2025**

Acknowledgments

This workshop has the support of Finnish Research Council and University of Oulu Profi7 Hybrid Intelligence research programme, and the European Chanse DiGeMERGE project, which are gratefully acknowledged.

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