



ExUM 2024 - 6th Workshop on Explainable User Modeling and Personalised Systems

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ABSTRACT

Adaptive and personalized systems have become pervasive technologies, gradually playing an increasingly important role in our daily lives. Indeed, we are now accustomed to interacting with algorithms that leverage the power of Language Models (LLMs) to assist us in various scenarios, from services suggesting music or movies to personal assistants proactively supporting us in complex decision-making tasks. As these technologies continue to shape our everyday experiences, ensuring that the internal mechanisms guiding these algorithms are transparent and comprehensible becomes imperative. The EU General Data Protection Regulation (GDPR) recognizes the users' right to explanation when confronted with intelligent systems, highlighting the significance of this aspect. Regrettably, current research often prioritizes the maximization of personalization strategy effectiveness, such as recommendation accuracy, at the expense of model explainability. To address this concern, the workshop aims to provide a platform for in-depth discussions on challenges, problems, and innovative research approaches in the field. The workshop specifically focuses on investigating the role of transparency and explainability in recent methodologies for constructing user models and developing personalized and adaptive systems.

CCS CONCEPTS

• **Information systems** → **Recommender systems**; **Personalization**; • **Human-centered computing** → **User models**; • **Computing methodologies** → **Natural language processing**.

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KEYWORDS

Explainability, Transparency, Interpretability, User Modeling, Personalization, Recommender Systems

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1 INTRODUCTION

Our interactions with adaptive and personalized systems have become ubiquitous, leveraging personal data to enhance various aspects of our lives. These personalized and adaptive services are continuously evolving, becoming part of our everyday lives and increasingly acting as personal assistants that proactively help us in complex decision-making tasks, such as recommending music, movies, or news articles that align with our preferences.

Unfortunately, most of these systems rely on black box models, whose internal mechanisms are opaque to end-users. While users typically appreciate the personalized suggestions and the support for decision-making, they are often unaware of the underlying rationale guiding the algorithms in the adaptation and personalization process. Moreover, the evaluation metrics commonly employed to assess the effectiveness of the algorithms tend to maximize the accuracy of the suggestions at the expense of the transparency and explainability of the model.

This issue is even more significant in light of the EU General Data Protection Regulation (GDPR), which emphasizes the need and right for transparent, scrutable, and interpretable methodologies. The GDPR emphasizes the users' need to comprehend these systems' information and the internal behaviour of personalization algorithms. This pivotal need engenders several crucial research directions, including the construction of scrutable user models and transparent algorithms, analysis of the impact of opaque algorithms

on end-users, exploration of explanation strategies, and investigation into empowering users with greater control in personalization and adaptation processes.

In response to these challenges, the ExUM workshop seeks to provide a platform for in-depth discussions, addressing the problems, challenges, and innovative research approaches for constructing user models and developing personalized and adaptive systems. By bringing together researchers and practitioners, the workshop aims to foster collaboration, knowledge exchange, and the development of novel solutions. Through this collective effort, we can advance the understanding and implementation of transparent and interpretable approaches in adaptive and personalized systems, including integrating Language Models (LLMs) to enhance transparency and enable users to comprehend the internal mechanisms guiding these systems.

Topics of interest include but are not limited to:

- Transparent and Explainable Personalization Strategies
 - Scrutable user models;
 - Transparent user profiling and personal data extraction;
 - Explainable personalization and adaptation methodologies;
 - Novel strategies (e.g., conversational recommender systems) for building transparent algorithms;
 - Transparent personalization and adaptation to groups of users.
- Transparent personalization based on Large Language Models
- Designing Explanation Algorithms
 - Explanation algorithms based on item description and item properties;
 - Explanation algorithms based on user-generated content (e.g., reviews);
 - Explanation algorithms based on collaborative information;
 - Building explanation algorithms for opaque personalization techniques, (e.g., neural networks, matrix factorization, deep learning approaches);
 - Explanation algorithms based on methods to build group models.
- Designing Transparent and Explainable User Interfaces
 - Transparent user interfaces;
 - Designing transparent interaction methodologies;
 - Novel paradigms (e.g., chatbots, LLMs) for building transparent models.
- Evaluating Transparency and Explainability
 - Evaluating transparency in interaction or personalization;
 - Evaluating explainability of the algorithms;
 - Designing user studies for evaluating transparency and explainability;
 - Novel metrics and experimental protocols.
- Open Issues in Transparent and Explainable User Models and Personalized Systems
 - Ethical issues (fairness and biases) in user / group models and personalized systems;
 - Privacy management of personal and social data;

- Discussing recent regulations (GDPR) and future directions.

2 WORKSHOP GOALS

In light of our research question, *How can we deal with the dichotomy between the need for effective adaptive systems and the right to transparency, scrutability, and interpretability?*, the goal of the workshop is to provide a forum for discussing problems, challenges, and innovative research approaches in this area. Thus, we investigate the role of transparency, scrutability, and explainability in the recent methodologies for building user models or developing personalized and adaptive systems.

Generally speaking, as expected outcome, we answer and discuss (some of) these questions:

- (1) How can we build transparent user models? Can we design transparent data extraction strategies?
- (2) Can we propose new recommendation and personalization strategies to consider transparency and explainability?
- (3) What is the role of explanation algorithms in light of transparent and explainable personalization pipelines?
- (4) Can we introduce explanation strategies in opaque models such as neural networks and matrix factorization techniques?
- (5) What kind of novel metrics can go beyond accuracy and reward more transparent and explainable recommendations?
- (6) Can we think about novel personalization paradigms (e.g., chatbots, conversational recommender systems) that enable a more transparent interaction?
- (7) What is the role of end-users in personalization and adaptation algorithms?

3 ACCEPTED CONTRIBUTIONS

We accepted eight contributions, namely five regular research papers, one short research paper, one demo, and one project description:

- (1) ***Human Pose Estimation for Explainable Corrective Feedbacks in Office Spaces*** by Gaetano Dibenedetto, Marco Polignano, Pasquale Lops, and Giovanni Semeraro proposes a novel system for assessing the sitting posture of a person at a desk by utilizing available cameras. The learned model can then provide personalized feedback to people to help them improve their sitting posture.
- (2) ***LLM-generated Explanations for Recommender Systems*** by Sebastian Lubos, Thi Ngoc Trang Tran, Alexander Felfernig, and Seda Polat Erdeniz presents the results of an online user study (N=97) aiming to evaluate how users of feature-based, collaborative filtering, and knowledge-based recommender systems perceive the quality of post-hoc explanations generated by a large language model compared to baseline explanations.
- (3) ***The Effect of Proactive Cues on the Use of Decision Aids in Conversational Recommender Systems*** by Yuan Ma and Jürgen Ziegler investigates, in an online user study (N=270), how the use of proactive and passive interaction styles influences the user experience and interaction behaviour with a conversational recommender system.

- (4) **Classifying User Roles in Online News Forums: A Model for User Interaction and Behavior Analysis** by Felix Scholz, Thomas Elmar Kolb, and Julia Neidhardt proposes an explainable model to classify users based on their activity and interaction patterns in online news forums, with the goal of understanding user behaviour in time or across contexts.
- (5) **Explanations in Open User Models for Personalized Information Exploration** by Rully Agus Hendrawan, Peter Brusilovsky, Arun Balajee Lekshmi Narayanan, and Jordan Barria-Pineda examines how different types of explanation styles and with varying levels of details can assist users in building their profiles and control the recommendations they receive in an educational information exploration platform.
- (6) **Perception versus Reality: Evaluating User Awareness of Political Selective Exposure in News Recommender Systems** by Alain D. Starke, Anders Sandvik Bremnes, Erik Knudsen, Damian Trilling and Christoph Trattner investigates, in an online user study (N=160), whether the exposure modalities of news items (randomized vs. biased) in relation to the political orientation (democratic vs. republican) of participants, influence users' ability to identify politically aligned news items.
- (7) **ScrollyPOI: A Narrative-Driven Interactive Recommender System for Points-of-Interest Exploration and Explainability** by Ibrahim Al Hazwani, Tiantian Luo, Oana Inel, Francesco Ricci, Mennatallah El-Assady, and Jürgen Bernard introduces ScrollyPOI, an interactive recommender system that, inspired by Data Humanism principles, adopts a scrollytelling approach to collect user preferences in cold-start scenarios and provide explanations for recommendations.
- (8) **Devising Scrutable User Models for Time Management Assistants** by Jovan Jeromela and Owen Conlan presents an ongoing research project outlining the benefits and challenges in devising scrutable Intelligent Personal Assistant for time management assistance.

4 ORGANIZATION

- **Cataldo Musto** - Assistant Professor at the Department of Informatics, University of Bari. His research focuses on the adoption of natural language processing techniques for fine-grained semantic content representation in recommender systems and user modeling platforms. He acts as a program committee member for the ACM Recommender Systems Conference, and the Conference on User Modeling Adaptation and Personalization and he organized several events related to user modeling and recommender systems.
- **Amra Delić** - Assistant Professor at the Department of Computer Science and Informatics, University of Sarajevo. Her research focuses on personalized systems that support group decision-making processes by exploiting various user, group, and interrelationship features and on investigating the role of explanations in group recommender systems. She has participated in organizing tutorials and workshops at the ACM Recommender Systems Conference, and the Conference on User Modeling Adaptation and Personalization, for which she also acts as a program committee member.
- **Oana Inel** - Postdoctoral Researcher in the Department of Informatics, University of Zurich. Her research focuses on investigating the use of explanations as a means of providing transparency for decision-support systems and fostering reflection in people. She has co-organized courses, workshops, and tutorials in the area of explanations, recommender systems, semantic web, and human-in-the-loop systems at a diverse set of conferences, such as UMAP, RecSys, TheWebConf, SIGIR, ISWC.
- **Marco Polignano** - Assistant Professor at the Department of Informatics, University of Bari, Italy, in the SWAP (Semantic Web Access and Personalization) research group. His research interests include Recommender Systems, Natural Language Processing, Machine Learning, and User Profiling. He was a program committee member and reviewer for many international conferences, local organizing committee for the Ai*ia 2017 and CLiC-it 2019 conferences and was among the organizers of ACL 2022 and EACL 2024 conference.
- **Amon Rapp** - Associate Professor in the Department of Computer Science at the University of Torino, where he leads the Smart Personal Technology Lab at ICxT. His research focuses on how people interact with self-tracking technologies, wearable devices, video games, gamified applications, and behavior change systems. He is also interested in qualitative and design research methods as well as in the theoretical and methodological implications of phenomenology and postphenomenology for system design. He has organized several workshops in international venues such as Hypertext, UMAP, UbiComp, and CHI Play.
- **Giovanni Semeraro** - Full Professor in the Dept. of Computer Science at the University of Bari "Aldo Moro", Italy, where he leads the Semantic Web Access and Personalization (SWAP) "Antonio Bello" Research Group. His research interests include AI, recommender systems, intelligent information mining, retrieval and filtering, semantic and social computing, the Semantic Web, natural language processing, machine learning, and personalization. He is one of the founders of the Italian Association for Computational Linguistics (AILC). He is a member of the Steering Committee of the ACM Conference Series on Recommender Systems (ACM RecSys) and of the CINI National Laboratory on Artificial Intelligence and Intelligent Systems (AIIS).
- **Jürgen Ziegler** - Senior Full Professor in the Department of Computer Science and Applied Cognitive Science at the University of Duisburg-Essen, where he directs the research group on interactive intelligent systems. His main research interests lie in the areas of human-computer interaction, human-AI cooperation, recommender systems, and explainable AI. Among numerous other scientific functions, he has been the founding and long-term editor-in-chief of the Journal of Interactive Media, and chair of the German special interest group on user-centred artificial intelligence.

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