

First Workshop on Adaptive and Personalized Explainable User Interfaces (APEX-UI 2022)

Erasmus Purificato
erasmo.purificato@ovgu.de
Otto von Guericke University Magdeburg
Magdeburg, Germany
Leibniz Institute for Educational Media | Georg Eckert
Institute
Brunswick, Germany

Pasquale Lops
pasquale.lops@uniba.it
University of Bari
Bari, Italy

Cataldo Musto
cataldo.musto@uniba.it
University of Bari
Bari, Italy

Ernesto William De Luca
ernesto.deluca@ovgu.de
Otto von Guericke University Magdeburg
Magdeburg, Germany
Leibniz Institute for Educational Media | Georg Eckert
Institute
Brunswick, Germany

ABSTRACT

Adaptation and personalization are crucial aspects of the design and development of successful Artificial Intelligence systems, from search engines and recommender systems to wearable devices. The increased desire for customization inevitably leads to the need for the end-user to understand the rationale behind displaying that specific tailored content. User interfaces play a central role to provide the right explanations to the end-users. While adaptive and personalized user interfaces are well-known and advanced research fields, a common issue we face in terms of explainability is finding intelligent user interfaces following the *one-fits-all* paradigm without considering the different peculiarities of individuals.

The 1st Workshop on Adaptive and Personalized Explainable User Interfaces (APEX-UI 2022) aims to foster a cross-disciplinary and interdisciplinary discussion between experts from different fields (e.g. computer science, psychology, sociology, law, medicine, business, etc.) in order to answer a precise research question: *How can we adapt and personalize explainable user interfaces to the needs, demands and requirements of different end-users, considering their distinct knowledge, background and expertise?*

CCS CONCEPTS

- **Information systems** → **Search interfaces; Personalization;**
- **Human-centered computing** → **User interface programming.**

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KEYWORDS

adaptation, personalization, explainability, transparency, understandability, user experience

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1 DESCRIPTION AND MAIN GOALS

Artificial intelligence systems, including advanced search engines, recommender systems, digital voice assistants (such as Siri or Alexa), self-driving cars (e.g. Tesla) or computer vision applications (e.g. in the healthcare domain), have become an integral part of everyone's life. At the moment, the desire for automation and customization leads to the need of explaining and interpreting information in a personalized and adapted way for a user-centric experience.

Explainable AI (XAI) is a key research area having the goal of “*exposing complex artificial intelligence models to humans in a systematic and interpretable manner*” [4] that currently deals with these topics and aims to create intelligent systems that are more and more transparent, human-understandable and trustworthy, taking care of specific regulations, like the GDPR, which explicitly require users to be able to understand why and how a particular result was obtained. In such a scenario, the design and development of user interfaces (UIs) play a fundamental role in providing the proper explanations to the end-users, even more than implementing the system itself in many cases, and much research about innovative human-centred explainable AI systems has been recently done [1–3]. However, a common issue we may face in this context is to find intelligent user interfaces (UI) following the *one-fits-all* paradigm, meaning that for a single application or system, all the users receive the same explanations, without considering their different knowledge, background or expertise.

The 1st Workshop on Adaptive and Personalized Explainable User Interfaces (APEX-UI 2022) focuses on the need of personalizing and adapting information for supporting every single user. The UI should adapt and provide the corresponding presented results through understandable and explainable interaction patterns according to their user needs, demands, or requirements. In this workshop's scope, we aim to improve the exchange of ideas within the IUI community on research involving design, implementation and evaluation of adaptive, personalized, explainable and responsible artificial intelligence systems and user interfaces, focusing on peculiarities that differentiate user profiles. Moreover, the workshop is intended to foster a cross-disciplinary and interdisciplinary discussion between experts from different fields (e.g. computer science, psychology, sociology, law, medicine, business, etc.) to discuss problems and synergies in this exciting research topic.

1.1 Topics of interest

- Adaptive and personalized explainable interfaces;
- Adaptive explainable interfaces;
- Personalized explainable interfaces;
- Transparent and explainable user interfaces;
- Innovative methods for designing explainable interfaces;
- Interaction user interfaces;
- Ethical issues (Fairness and Biases) in explainable interfaces;
- User-adaptive XAI systems;
- Transparent and explainable user profiles;
- Evaluation criteria for explainable interfaces;
- Empirical studies and evaluation of explainable interfaces.

2 WORKSHOP PROGRAM

The program provides a good balance between the different topics covered by the workshop, including three full papers and two invited talks held by distinguished researchers in the areas of adaptation, personalization and explainability.

2.1 Accepted papers

- Erik Hekman (HU University of Applied Sciences), Dennis Nguyen (HU University of Applied Sciences), Marcel Stalenhoef (HU University of Applied Sciences), Koen van Turnhout (HU University of Applied Sciences). “*Towards a Pattern Library for Algorithmic Affordances*”.
- Maxwell Szymanski (KU Leuven), Katrien Verbert (KU Leuven), Vero Vanden Abeele (KU Leuven). “*Explaining health recommendations to lay users: The dos and don'ts*”.
- Qurat Ul Ain (University of Duisburg-Essen), Mohamed Amine Chatti (University of Duisburg-Essen), Mouadh Guesmi (University of Duisburg-Essen), Shoeb Joarder (University of Duisburg-Essen). “*A Multi-Dimensional Conceptualization Framework for Personalized Explanations in Recommender Systems*”.

2.2 Invited talks

- “*From Transparency and Users' Control in Recommender System Interfaces to Guidelines for Visual XAI*”
 - Speaker: Denis Parra, Associate Professor at Pontificia Universidad Católica de Chile

- Abstract: In this talk, Prof. Parra will review research from the latest 20 years on visual interfaces for recommender systems considering aspects such as explainability, transparency and users' control, how they relate to the user experience with recommendation systems, and what lessons we can synthesize from that work. Later, he will connect these results with the latest research on visual interfaces for explainable AI (XAI) systems, and will present new ideas and questions for current and future work.

- “*Explainable AI for non-expert users: towards the next generation of interactive and adaptive explanation methods*”

- Speaker: Katrien Verbert, Associate Professor at KU Leuven, Belgium

- Abstract: Despite the long history of work on explanations in the Machine Learning, AI and Recommender Systems literature, current efforts face unprecedented difficulties: contemporary models are more complex and less interpretable than ever. As such models are used in many day-to-day applications, justifying their decisions for non-expert users with little or no technical knowledge will only become more crucial. Although several explanation methods have been proposed, little work has been done to evaluate whether the proposed methods indeed enhance human interpretability. Many existing methods also require significant expertise and are static. Several researchers have voiced the need for interaction with explanations as a core requirement to support understanding. In this talk, I will present our work on explanation methods that are tailored to the needs of non-expert users. In addition, I will present the results of several user studies that investigate how such explanations interact with different personal characteristics, such as expertise, need for cognition and visual working memory.

3 PROGRAM COMMITTEE

List of the members of the workshop program committee who evaluated the workshop submissions:

- Vito Walter Anelli, Polytechnic University of Bari, Italy
- Alejandro Bellogín, Universidad Autónoma de Madrid, Spain
- Ludovico Boratto, University of Cagliari, Italy
- Peter Brusilovsky, University of Pittsburgh, USA
- Ivan Cantador, Universidad Autónoma de Madrid, Spain
- Federica Cena, University of Turin, Italy
- Bruce Ferwerda, Jonkoping University, Sweden
- Tracy Anne Hammond, Texas A&M University, USA
- Eelco Herder, Radboud University Nijmegen, the Netherlands
- Benedikt Loepp, University of Duisburg-Essen, Germany
- Amon Rapp, University of Turin, Italy
- Giuseppe Sansonetti, Roma Tre University, Italy

4 ORGANIZERS

Erasmus Purificato has been a Research Assistant in the “Digital Transformation and Digital Humanities” group at the Otto von Guericke University Magdeburg and a Research Fellow in the “Digital Information and Research Infrastructure”

department at the Leibniz Institute for Educational Media | Georg Eckert Institute (GEI), since February 2020. He is doing his Ph.D. in Computer Science at Otto von Guericke University Magdeburg with a project titled “Machine Learning for User Modeling and User-Adaptive Interaction”, with a focus on Responsible AI techniques. From July 2021 he has been appointed by the Guglielmo Marconi University of Rome, Italy, as an Adjunct Professor in “Software Engineering”. He studied Computer Engineering University of Naples “Federico II”, Italy, and earned his master’s degree in 2017. In 2019 he gained a postgraduate master’s degree in artificial intelligence at University of Turin, Italy. Between September 2017 and December 2018, he worked at Blue Reply company in Turin as a machine learning engineer, and from January 2019 he worked in the same company as a technical leader in the Cognitive&Data business unit, developing projects in computer vision and content-based image retrieval fields.

Cataldo Musto is Assistant Professor at the Department of Informatics, University of Bari. He completed his Ph.D. in 2012 under the supervision of Prof. Giovanni Semeraro. 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. In 2016 and 2017 he gave a tutorial at UMAP conference about the exploitation of semantics-aware representation in content-based personalized systems. Recently, he organized the workshop on Explainable User Modeling (ExUM), jointly held with UMAP 2019 and UMAP 2020.

Pasquale Lops is Associate Professor at the University of Bari, Italy. He received the Ph.D. in computer science from the University of Bari in 2005 with a dissertation on “Hybrid Recommendation Techniques based on User Profiles”. His research interests include recommender systems and user modelling, with a specific focus on the adoption of techniques for semantic content representation. He authored over 200 scientific articles, and he is one of the authors of the textbook “Semantics in Adaptive and Personalized Systems: Methods, Tools and Applications”, edited by Springer. He regularly serves in the program committee of the top conferences in his areas. He was Area Chair of User Modelling for Recommender Systems at UMAP 2016, and co-organized more than 20 workshops related to user modeling and recommender systems. He gave a tutorial on “Semantics-Aware Techniques for Social Media Analysis, User Modeling, and Recommender Systems” at UMAP 2016 and 2017, he was a speaker at two editions of the ACM Summer School on Recommender Systems. He was a keynote speaker at the 1st Workshop on New Trends in Content-based Recommender Systems (CBRecSys) at RecSys 2014. Finally, he gave the interview “Beyond TFIDF” in the Coursera MOOC on Recommender Systems.

Ernesto William De Luca is head of the “Digital Information and Research Infrastructures” (DIRI) department at the Leibniz Institute for Educational Media | Georg Eckert Institute (GEI) and from October 2019 has been appointed as a Full Professor in “Digital Transformation and Digital Humanities” at the Otto von Guericke University Magdeburg, Germany. In addition, in May 2015 he was appointed by the Guglielmo Marconi University of Rome as an associate professor in “Computational Engineering”. He studied computational linguistics and then gained his Ph.D. in computer science. His research includes machine learning, human-machine interaction, Natural Language Processing, user and data modelling as well as the Semantic Web and information Retrieval. He has written over 100 papers for national and international conferences and journals, organized and chaired numerous workshops and conferences, and is regular reviewer and programme committee member of different high-profile journals and conferences.

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