

# Workshop on Surprise, Opposition, and Obstruction in Adaptive and Personalized Systems (SOAP)

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## 1. BACKGROUND

The phenomenon often referred to as the “filter-bubble,” i.e., the effect that collaborative, as well as content-based recommender systems keep making obvious, predictable, redundant, uninspiring, and therefore disengaging suggestions based on previous interactions, has emphasized the value of system qualities beyond pure accuracy, e.g., *diversity*, *novelty*, *serendipity*, or *unexpectedness*, to keep the user satisfied, e.g., [1, 2, 4]. Apart from the obvious use case in commercial systems (where this user satisfaction directly translates to revenue), these additional qualities become even more important in other areas. For instance, in creative domains, such as music production, we find that similarity-based, “more of the same” recommendations have basically no relevance, as illustrated by a quote from a professional music producer on the use of recommender systems that could predict his behavior in the process of music making: “*I would be more interested in something that made me sound like the opposite of me [...] cause I can’t do that on my own*” (anonymous, during interview on location at the Red Bull Music Academy 2014, cf. [3]).

In fact, for creators and artists — as opposed to consumers — the idea of simulating a user based on the user’s past activity provides no added value, as the goal of creative work is something new that challenges and questions expectations and past behavior rather than reproducing it. Thus, opposite goals to those used in typical recommender systems matter when collaborating with an intelligent system for creative work: change of context instead of contextual preservation, defamiliarization [9] instead of predictability, or even explainability, opposition instead of imitation, and obstruction instead of automation. Still, these goals reside within the artist’s idea of personal style, putting a need for personalization of systems at the core of these concepts, cf. [7].

In this workshop, we address these topics by focusing on three promising elements for adaptive and personalized intelligent systems, namely *surprise*, *opposition*, and *obstruction*.

**Surprise** relates to established concepts like serendipity or unexpectedness in recommender systems. It comprises variations of known elements in unknown ways as well as unpredictable responses and behaviour. Some of the topics we consider relevant in the broader context of personalized systems and for the workshop are systems that focus on serendipitous encounters or offer intuitive control and exploration of complex parameter spaces to find something new and/or unexpected, and methods for explicitly controlling the amount of error of a system.

**Opposition** can be an extreme form of variation or dissimilarity. For instance, this could refer to a musical rhythm in a completely different style or the least relevant item in a retrieval system. There is no formal definition of opposition, and it is a very subjective and personal concept, that depends on the context. Thus, the given examples might be meaningful to some people (e.g., if they think that jazz is “the opposite” of heavy metal), whereas other can find common ground. Thus, finding or doing the “opposite” is a matter of the relevant dimensions and requires a definition of the possible space of actions. In our opinion, work that is dealing with exploration and formal definitions of “the opposite” is highly relevant for the proposed workshop.

**Obstruction** refers to the intentional restriction of functionality through the machine. Remotely related examples we have seen in the past comprise the deliberate reduction of user interface elements, such as complex menus in Microsoft Office, to make core functionality more visible. However, in our context we envision the machine to take a more active role, to “embody opposition,” so to speak, in order to facilitate and stimulate the creative process and output of the user. This comprises questions like “*When the computer says no, what impact does it have on a creative process?*,” “*Does the machine need personality to obstruct; does it help an artist to push against obstruction?*,” and finally, “*Who is in control? Who should be?*”.

Some of these questions arose at the CHI 2015 workshop “Collaborating with Intelligent Machines: Interfaces for Creative Sound” [6], that was co-organized by the first two proponents of this workshop proposal. The focus of this workshop was the role of machine interaction in the creative

process of music making, and it became clear that imitation and simple “additive” systems that provide just more of what is there already are not only redundant and annoying, but actually lead to a limitation of expression. Instead, it is necessary to embrace limitation of systems, interplay between human and machine, conflict, disagreement, and failure as a means of creative expression, cf. [5]. This would allow systems to become more akin to a machine collaborator that could come up with its own recommendations and make suggestions based on the personal requirements of the individual user, or as another music producer puts it: “*Well, I like to be completely in charge myself, but I like to... I don't like other humans sitting the chair, but I would like the machine to sit in the chair, as long as I get to decide when it gets out*” [3]. When taking these considerations of interaction out of the purely creativity-focused context, we might also find these to be parameters that can lead to increased engagement in other scenarios.

We think that this is the right time for a workshop on the topics of surprise, opposition, and obstruction in adaptive and personalized systems. Adaptive and personalized systems, e.g., in the form of recommender systems, have become ubiquitous and established concepts in digital life, but, due to their overwhelming presence and exhibition of their drawbacks, have also lost some of their “magic” and have, to some extent, become predictable and dull. This is not only witnessed by the ongoing trend in academic research to enhance the functionality of such systems beyond accuracy [2], but also by statements in pop-cultural media that demand for “*Algorithms that analyze what you like/believe and show you a constant feed of the opposite.*” (William Gibson via Twitter in April 2015). It appears that in creative work as well as in the consumer world, successful imitation is not enough for the machine to be recognized as “intelligent” anymore. While this is a first and necessary step in creative and intelligent behavior, cf. [8], a machine requires more multifaceted and complex behavior in order to be considered a useful advice-giver or even collaborator. Aspects of human behavior, such as surprise, opposition, and obstruction, would undoubtedly contribute to this and make the interaction with the machine more interesting and engaging.

## 2. WORKSHOP PROGRAMME

We are delighted to see the high-quality programme we could put together for the SOAP workshop. Following the origin of the workshop’s topic in the area of sound and audio retrieval for creativity, three of the papers deal with topics of recommendation in the music domain. The paper *Investigating the Relationship Between Diversity in Music Consumption Behavior and Cultural Dimensions: A Cross-Country Analysis* by Ferwerda and Schedl investigates several measures to identify how users in different countries apply music diversity to their listening behavior, showing that different diversity needs exist in different cultures. In their paper *Towards Playlist Generation Algorithms Using RNNs Trained on Within-Track Transitions*, Choi et al. introduce a novel playlist generation algorithm based on a recurrent neural network that can effectively model transitions of music tracks. The paper *A Prototype for Exploration of Computational Strangeness in the Context of Rhythm Variation* by Knees and Andersen investigates the recently emerged idea of “computational strangeness,” which represents algorithmic recommendations as artistic obstructions in creative

work. Finally, the paper *Towards Multi-Stakeholder Utility Evaluation of Recommender Systems* by Burke et al. deals with a general consideration of personalization in recommenders integrating the concerns of multiple stakeholders.

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