

# The power of imagination: immersive and experiential counterfactuals to engage with sustainability

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## Abstract

Imagination is a faculty that can underlie the transformations towards alternative futures, which are central in the discourses developed in Futures Studies and Design Futures, composed of different approaches and methodologies, such as Speculative Design (Dunne & Raby, 2013), Design Fiction (Bleecker, 2009) and Experiential Futures (Kelliher & Byrne, 2015). All these share a common goal: the crafting of questions related to futures to foster dialogues about present wicked issues rather than problem-solving (Angheloiu et al., 2020).

Focusing on the topics of interest, imagination has demonstrated to be able to influence transformations towards sustainable and just futures (Moore & Milkoreit, 2020) and, if fostered and enhanced, it can become a powerful medium to engage with more-than-human actors (Romani et al. 2022); however, as R. Bendor (2018) argues there is still a lack of collective ability to imagine rich possibilities for building alternative futures. Wapner and Elver (2016) note the same lack of options and pathways to achieve them. Imagination turns out to be necessary to draw experience and knowledge from the present and the past and to reconstruct this knowledge with a new meaning, thus acquiring a new (Abrahams, 2020; Salis & Frigg, 2020). This characteristic of imagination, also referred to as counterfactual thinking, and strongly linked to what-if questions, introduces an initial gap found both in the discipline of Futures Studies and Design Futures: it is clear the connection between counterfactual thinking and future thinking, and, consequently, the link that exists between pasts, alternative pasts and possible futures, which is a still poorly researched subject by future scholars and practitioners (Bendor et al., 2021). Like the future, also the past may be seen as a plurality and a sort of repository for opportunities and possibilities (Bendor et al., 2021) that can deepen and strengthen the engagement with alternative futures and their potentiality in shaping, in return, new worldviews and mindsets in the present. Within the field of Design Futures, several researchers highlight a second gap that can be defined as an experiential gap: the difficulty in making futures livable and tangible.

To overcome this gap, immersive technologies can represent an important design opportunity, capable of implementing the frameworks, methods and tools related to Design Futures. In this direction, the research introduces the concept of Immersive and Experiential Counterfactuals, as an approach to be integrated to Experiential Futures.

## Author keywords

Imagination; Counterfactual thinking; Immersive experience; Nature-human interaction; Alternative pasts.

## Introduction

Imagination can underlie the transformations towards alternative futures, which are central in the discourses developed in Future Studies and Design Futures, a Design field that tries to nurture questions, reflections, and dialogues about current and potential trends, issues and opportunities, by projecting possible scenarios in the future and backcasting them in the present to define and design the paths to achieve what is considered to be desirable.

The research introduced in this contribution focuses on the interaction between human beings and nature and the relationship with more-than-human actors, by identifying imagination and immersive experiences as potential media to raise people's awareness and involvement on the topics of interest.

It is interesting to note that imagination, in its complex functioning, contributes both to our ability to think about future and to our capacity to remember past situations: it can be seen as a medium that let us to travel backward and forward in time, of which the latter, as stated above, constitutes one of the fundamental pieces for the Design Futures field. These aspects allow to introduce a first disciplinary gap, which is a key focus of the research being presented: the link that exists between pasts, present and futures is still a poorly researched subject by future and design scholars and practitioners (Bendor et al., 2021). By traveling backwards in time, it is possible to pluralize the past, and then, moving forward to present, the result is a set of alternative and desirable presents that can be projected forward in time, exponentially multiplying the pathways to achieve future goals.

Both futures and (distant) pasts are inherently nearly impossible to actually experience, precisely because of their temporal placement: this aspect represents a second gap, which can be defined experiential, and which led to the definition of the framework of Experiential Futures (Candy & Dungan, 2017), that, exploiting Design tools, tries to bridge this gap, making futures liveable and tangible. To utterly overcome this issue, immersive technologies can play an important role and opportunity: in this direction, the research introduces the concept of Immersive and Experiential Counterfactuals, as an approach to be integrated by Experiential Futures.



The first part of the paper presents a discussion on imagination; the second deals with the theme of immersive experience and immersive technologies, while the third briefly presents the field of Design Futures, with particular attention to speculative approach, Design Fiction and Experiential Futures. The fourth part is dedicated to the introduction of Immersive and Experiential Counterfactuals. The contribution ends with the conclusions that summarize what was previously stated.

## Imagination

From a general perspective, imagination is a speculative state of mind that allows us to consider situations outside of the here and now (Kind, 2017); it is also capable of producing ideas and images without direct sensory stimulus, often by combining fragments of previous sensory experiences into new syntheses (Van Den Bos, 2007). It presents perceptual, recollective, generative, phenomenological, and altered-state-of-mind (Abraham, 2020) facets.

Focusing on the topics of interest, imagination has demonstrated to be able to influence transformations towards sustainable and just futures (Moore & Milkoreit, 2020), but as R. Bendor (2018) argues there is still a lack of collective ability to imagine rich possibilities for building alternative futures. Warner and Elver (2016) note the same lack of options and pathways to achieve them. Imagination turns out to be necessary to draw experience and knowledge from the present and the past and to reconstruct this knowledge with a new meaning, thus acquiring a new (Abrahams, 2020; Salis & Frigg, 2020). However, it also represents a form of liberation from reality (Kind & Kung, 2016), becoming a resource for the creation of ideas that does not suffer from the constraints given by rationality (Hairston, 2016), and, so, a source for novelty and change (Hawlina et al., 2020).

Interestingly, imagination is strongly situated and influenced by different factors, such as physical, social and ecological realities that shape our memory and experiences (Whyte, 2018).

It can enable transformation-focused agency (Moore, 2017), helping in identifying goals and actions to support the realization of the hypothesized situations (Galafassi et al., 2018). Finally, it needs time and spaces for interaction and collaboration, to let people share ideas and thoughts (Yusoff & Gabrys, 2011) about alternative worldviews. There are other agents capable of

influencing individual and collective imagination which clearly contribute to transformations and transitions towards alternative futures: nature (Milkoreit, 2017) and technology (Balsamo, 2011).

The technological imagination can be defined as the mindset which enhances people to think and perform with technology, and to transform the unknown into possibilities (Balsamo, 2011).

Other authors define the concept of imagination in relation with technology: for example, G. Wellner (2018) defines the posthuman imagination, from an examination of the concept of imagination in modern and postmodern philosophy: a faculty that works by layer and it is co-formed by the relationships between human beings and technologies, which empower, mediated and shift; it is distributed and incorporated by humans and technologies.

Through this process of analysis, it has been possible to define imagination as “the recollective (related to experience

and memory), generative (related to hypothetical reasoning and counterfactual thinking), immersive (related to action and interaction), and phenomenological process (related to emotions, engagement, and sensemaking), that enables to experience past, present and future situations and generates peculiar conditions to embrace alternative possibilities” (Fig. 1).

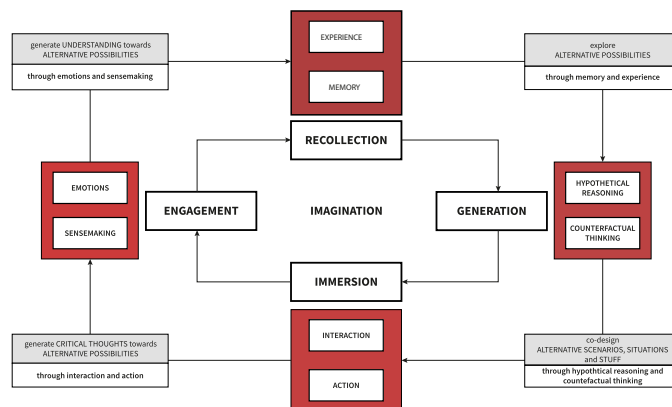
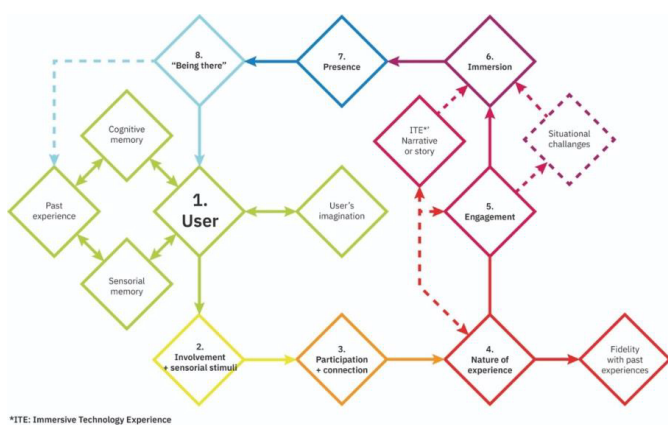


Figure 1. The imaginative framework

## Immersive experience

Imagination is strongly connected to and influenced by experience, which represents, in its immersive aspect, the second subject of the research, with particular attention for immersive technologies. Regarding this topic, it has been decided to provide a single taxonomy (Milgram & Kishino, 1994; Skarbez et al., 2021), to define the reality-virtuality continuum: starting from reality, and moving to the right, the degree of virtuality of possible environments and interactions increases, finding Augmented Reality (AR), Augmented Virtuality (AV), Virtual Reality (VR), and what has been defined as Matrix-like Virtual Environment).

To make clear the connections between this topic and the subject of imagination, it is interesting to cite the research by Stapleton and Davies (2013) which is focused on extended and mixed reality technologies and the role that imagination can play in relation to these: it becomes a third reality in the reality-virtuality continuum that benefits from mixed reality as a new medium to be exercised in different fields. The combination of immersive technologies with the activities among different fields creates what is known as immersive experiences (Lucho Ligan et al., 2021). In order to define and achieve an immersive experience, various aspects must be evaluated and taken into consideration: sensorial fidelity (Bowman & MacMahan, 2007), sensorial immersion (Dangxiao et al., 2019), sensorial stimuli (Bowman & MacMahan, 2007; O’Brein & Toms, 2008), “being there” (Bowman & MacMahan, 2007; Shin, 2017), challenges (Ermi & Mäyrä, 2005; O’Brein & Toms, 2008), connection participation (Pine & Gillmour, 1999), involvement (Pine & Gillmour, 1999; Slater & Wilbur, 1997), imagination (Ermi & Mäyrä, 2005; Pine & Gillmour, 1999), presence (Shin, 2017), interaction (Dangxiao et al., 2019), and, finally, engagement (O’Brein & Toms, 2008; Shin, 2017). Starting from this analysis, Lucho Ligan et al. (2021) proposed a framework to map, ideate, design, and produce immersive experience, namely Immersive Cycle, divided into different steps, for which they also developed guidelines (Fig. 2).



**Figure 2.** The immersive cycle.  
(Credit: Lucho Lingan et al, 2021. Graphic revision by the author)

It is interesting to note the different overlaps between the Immersive Cycle and the framework developed to define Immersive Imagination, especially noticeable in the IC areas of the user (step 1) and in the ones dedicated to engagement (step 5) and immersion (step 6).

Merging the two frameworks may result in an effective starting point for developing a set of guidelines to facilitate the design of alternative situations (Candy, 2010), and, therefore, to let people be able to experience these, utterly facilitating the identification and the immediacy of the user's experience itself, and, thus, the bridging of what Candy (2010) indicated as the experiential gap.

The research recognizes Augmented Reality as the most suitable and promising technology to be applied in the field of interest, for several reasons: its accessibility and ease of use and less complex design compared to other immersive technologies, due to the numerous tools and platforms available. Finally, by working through layers, it allows us to experience multiple alternatives and realities simultaneously, thus enabling the collapse of different timelines onto each other. In ontological terms, this characteristic brings it closer to the field of design futures and to certain intrinsic traits of imagination.

## Design Futures

Throughout the last two decades, the intersection between the field of Design and the field of Future Studies has generated various approaches such as Speculative Design (Dunne & Raby, 2013), Design Fiction (Bleecker, 2009) and Experiential Futures (Kelliher & Byrne, 2015). Although they are not structured methodologies, it is possible to identify common strategies in these approaches, taking into consideration what reaction is intended to be triggered in the people who benefit from the designed outputs in some way: at a first level, there is an exploratory strategy, whose aim is to make people aware about the topics of interest and alternatives and possibilities; the second strategy deals with reflection and it aims to provoke or stimulate the creation of critical thinking regarding the topics and the explored alternatives and possibilities; finally, there is a strategy that aims at a real understanding of the topics and alternatives and, therefore, at embracing the possibility for a change. These highlighted strategies informed the design of the framework that will be described in the next section. Speculative Design is an approach that deals with long-term futures, focusing on technologies, social and environmental trends, weak signals and wild cards, to stimulate the critical thinking of projects' users (Kerridge, 2016). Design Fiction

can be defined as a design practice that creates provocations about possible futures, narrated through designed and diegetic artefacts (Kirby, 2010). The aim of Design Fiction is to facilitate and foster conversations regarding issues of interest, related to alternative presents and near possible futures (Coulton et al., 2017). Finally, Experiential Futures refers to a set of approaches to make alternative futures present, cognitively and culturally understandable (Candy & Dunagan, 2017) and to produce multisensory, transmedia, and diegetic representations of images of the future (Candy & Kornet, 2019).

Compared to what has been previously stated, the last approach presented turns out to be the most interesting for the research, which aims at integrating the knowledge derived from the study on imagination and immersive experiences, together with those related to alternative pasts (explained in the next part), to further discourses related to alternative and sustainable futures.

## Immersive and experiential counterfactuals

Counterfactual thinking, a concept already explored in relation to imagination, is a psychological concept that indicates the human tendency to create and explore alternative situations to events that already occurred, and it is usually based on "what if" questions. One of the most interesting and important characteristics of counterfactual thinking is the analysis of past errors in order to avoid them in the future, revolving around the idea that similar situations may take place again (Epstude & Roese, 2008). Another important aspect is its capacity to facilitate behavioural change (Scholl & Sassenberg, 2014), and to drive collective actions, since they can increase the level of group identification and efficacy (Van Zomeren et al., 2010).

Yet strongly dealing with past experiences and the potential of "what if" questions in exploring alternative situations, it is clear the connection between counterfactual thinking and future thinking, and, consequently, the link that exists between pasts, alternative pasts and possible futures, which is a still poorly researched subject by future scholars and practitioners (Bendor et al., 2021).

Like the future, also the past may be seen as a plurality and a sort of repository for opportunities and possibilities (Bendor et al., 2021) that can deepen and strengthen the engagement with alternative futures and their potentiality in shaping, in return, new worldviews and mindsets in the present. Therefore, past-facing approaches are a tool to extend the imagination and, with it, the realm of possibilities, to reflect on past decisions, events and situations (Bendor et al., 2021). Furthermore, past-facing approaches are extremely useful to learn from the past in order to understand all the paths undertaken throughout the histories of humankind (Voros, 2019), and the influence that every timeline (pasts, presents, futures) have on the others (Poli, 2018). They can also be seen as a temporal device that creates an interesting context for considering anticipation, due to their capability in providing forks in the past from which futures may flow forward (Light, 2021).

The Immersive and Experiential Counterfactuals framework is to be intended as a set of tools and guidelines which, in the first steps, facilitate the process of scenario and alternative situation building, exploiting counterfactual thinking and what if questions, filtered by the above-mentioned strategies, and simulating the typical approach of Experiential Futures; while in the second stage, drawing on the designed scenarios and alternative situations, it proposes guidelines to design immer-

sive experiences, mediated by augmented reality and useful to make more tangible what has been hypothesized (Fig. 3).

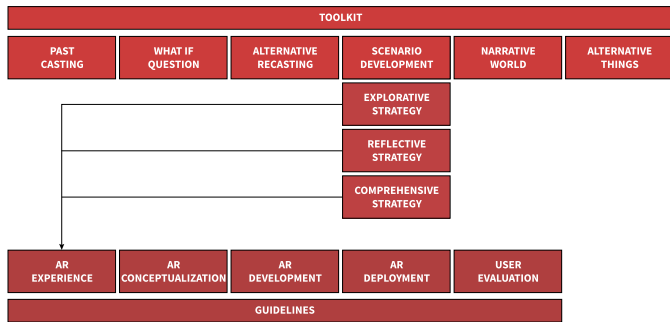


Figure 3. The general view of Immersive and Experiential Counterfactuals framework.

### Conclusion

The contribution suggests the definition of a framework entitled Immersive and Experiential Counterfactuals, which is based on counterfactual thinking, an integral part of the imagi-

native process, and on Augmented Reality technology as a medium to make temporal alternatives and new possible points of view more livable and tangible, capable of building new relationships with the natural world and non-human actors.

The framework, consisting of a series of tools and guidelines, is positioned within the field of Design Futures - and in particular stands as an integration to the framework of Experiential Futures - a design domain that aims at building alternative and future visions concerning issues of interest, often related to the concepts of sustainability and regeneration of more balanced relationships with nature.

The design of this framework attempts to address two gaps inherent in the discipline of interest: a historical gap, which can be further defined as a lack of comprehensive research and literature, within the field of Design Futures, regarding the correspondence between counterfactual thinking and future thinking and, consequently, between the past, alternative pasts and futures scenarios construction; and an experiential gap, conceivable as the challenge in making experiential events and situations that happened far back in time or have not yet happened.

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