Confabulation Radio: Reflexive Speculation in Counterfactual Soundscape

Figure 1: The Confabulation Radio in domestic settings.

Figure 2: A counterfactual artefact in everyday practice, triggering the suspension of disbelief of an alternative world.

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ABSTRACT

Material speculation through counterfactual artifacts has been an alternative approach to envisioning possible worlds in HCI. This paper further explores how false memory, or confabulation, can be a resource for enriching this constructive design approach. We conducted an explorative study to understand how personal experience of confabulation can contribute to the constitution of the body of possible worlds and to explore the potential of using mixed everyday soundscapes as a medium to trigger possible-world-experience. The result shows that these "counterfactual soundscapes" can create self-convinced experiences of counterpart self, which indicates a reflexive but fictional self across possible worlds. Based on these findings, we proposed the model of counterpart self that accounts for reflexive speculation in possible worlds and made a research artifact, the Confabulation Radio, as our attempt to inquire into this phenomenon.

CHI'19 Extended Abstracts, May 4-9, 2019, Glasgow, Scotland, UK.

ACM ISBN 978-1-4503-5971-9/19/05.
DOI: https://doi.org/10.1145/3290607.3312858

KEYWORDS

Confabulation; possible world; counterfactual soundscape; counterpart self; autobiographical memory; speculative design

Possible Worlds: "Possible worlds theory relies upon the ideal that reality is comprised of all that we can imagine and that it is composed of the 'actual world' and all 'possible worlds' " [16].

Counterfactual Artifacts: "The counterfactual artifacts as being if...then statements trigger possible world reasoning that extends beyond them" [16].

Table 1: Related Works of Personal Experience for Possible Worlds

Studies/ Cases	*Materials*	*Methods*
Poetics of Design Fiction	personal memory	The participants were instructed to write a deeply impressed experience in their life and place this memory in the context of a dystopian novel, by adding a few sentences that would frame the situation as if it was taking place related with the novel world [11].
Solution Printer	dreams	A fictional but convincing artifact, dreamcatcher, adds a Photoshop script that transforms the uses' familiar city landscapes into desolate images to construct a shared dream experience [5].

INTRODUCTION

There has been an increasing interest in promoting speculative design as an alternative way to provoke imagination about the future in HCI. Dunne and Raby [4] introduced Lubomír Doležel's notions of possible worlds to speculative design, which moves us from the present to the realm of possible worlds. Wakkary et al. [16] further framed material speculation as presenting counterfactual artifacts that indicate possible worlds.

Most speculative designs form themselves as tangible artifacts [4, 16], addressing 'what-if' questions, or counterfactual statements, with speculation and imagination. This paper addresses how our work might add to a reflexive perspective on speculative design. To enrich possible-world-experience, we examine the current design practice and raise two questions: (1) Beyond speculation and imagination, is there any other type of activity or material constituting the body of possible worlds, e.g., personal experience such as false memory or confabulation? (2) Besides materialized artifacts, what is the potential medium to communicate possible-world-experience, e.g., self-recordings or soundscape? Above all, how might we craft possible-world-experience not only looking at the external environment but also reflexively speculating toward self within the possible world, or a counterpart self across actual and possible worlds?

Possible World and Personal Experience

A number of discussions have focused on how actual artifacts mediate effectively between the present and the possible worlds. Wakkary et al.'s study highlighted lived-with experience such that design artifacts embodying research questions are embedded with the domestic routines [16, 5]. Dunne and Raby emphasized another aspect regarding the aesthetics of speculation, and suggested designing props for 'making-believe' through a skillful use of strangeness, ambiguity and unfamiliarity produced by the visual clues [4]. In addition, we see other approaches which integrate personal experience into alternative narratives to bridge the boundary between the actual world and fiction. Different kinds of reflexive materials that indicate the user herself could be applied to fictional narratives to evoke strong personal experience, such as the deeply impressed memory, daily photos, or names (Table 1). Establishing the correlation between the personal experience and the alternative reality would probably present strongly reflexive possible-world-experience. Thus, it seems that the viewers could not only play the roles as irrelevant others, but somehow actually appear in the fictional world with a first-person perspective. To answer the question "how might we create felt experience within a possible world," we wonder whether reusing data representing personal experience would better create the impression of counterpart selves in possible worlds.

Counterfactual Soundscape

Although audio is regarded as one of the most powerful media to suspend disbelief [2], speculative designs with audio are relatively fewer than tangible artifacts. Most cases craft counterfactual

Quantum Parallelo-graph	parallel lives	The device speculates on the existence of parallel universes and uses online sources to find the "parallel lives" of users and prints out a short statement about their "simultaneous" life in a parallel world [13].

Table 2: Related Works of Counterfactual Soundscapes

Studies/ Cases	*Forms*	*Methods*
Ekkomaten	situated sound-scape	A historic site intends to blur the boundary of facts and fictions as participants were engaged as protagonists listening to actual and historic (yet fictional) soundscape simultaneously [7].
Moon Graffiti	radio fiction	The dialogues of spacemen backgrounded with roaring sounds of engines, beeps of electronic devices, and the crashing sound effects, successfully create impressively historical recordings of a counterfactual failed space mission (Apollo 11) [9].
Once Upon a Future	story-telling board game	Imaginative and futuristic background sounds support radio-drama-style improvisation for future co-creation, recorded as prefactual soundscape [3].

soundscape to invite users to revisit a site or an event with fictional narratives (Table 2).

In this study, we first explore the experiential quality of personal audio-recordings and see its potential beyond evoking our memory. We summarize and speculate on our fieldwork and then present a sound remixing system coupling the everyday recordings with other sound tracks to slightly defamiliarize them such that we might allow users to develop an alternative reality. We regard this mixed audio medium as counterfactual soundscape that might refer to a possible world. In certain cases, a self-related fiction like false memory was experienced where participants seemed to actually appear in an alternative reality. Such kind of self-convinced phenomena of experiencing an unreal truth are regarded as confabulation. Based on the preliminary results of using our design artifact, Confabulation Radio (see Fig. 2), we will present reflection, future work, and conclusion.

FIELDWORK

The fieldwork included an explorative activity with 8 participants who were asked to record surrounding sounds and prepare several familiar music clips. After that, one music clip and one recording were mixed randomly. Two weeks later, all participants were invited individually to listen to their own mixes. There were three types of music clips prepared by the participants: nostalgic pop songs, movie soundtracks, and everyday functional melodies (e.g., subway station broadcasting, radio jingles). The recorded surrounding sounds were categorized into three types: self-talk, conversation, and ambient sound.

Reminiscence, Recall and Working Self

The phenomena such as reminiscence always occur when nostalgic pop songs are played (Table 3, roll 1). Rewound to her adolescence, P2 deliberately ignored the difference between the recorded sounds and the past. It was a kind of re-imagination of adolescence from an adult's perspective.

In other cases, these sound clips do not affect each other and different memories are just reviewed as they were. The listeners would like to interpret the association and meanings of these memories, which we regard as recall.

Meaning-making for self-identity appears to be the main process in reminiscence and recall. It has been understood as working self in autobiographical memory (Fig. 3), which indicates a set of active personal goals or self-images working together to modify cognition and the resulting behavior so an individual can operate effectively in the world [15].

Confabulation and Counterpart Self

Besides reminiscence and recall, there was another unusual phenomenon we call confabulation [1, 6]. Although in psychiatry confabulation usually refers to a memory error, we see the shared similarities of the production of fabricated and misinterpreted memories about oneself. In this study, 'confabulation' is regarded as a neural activity that intends to make sense of distorted audio composition rather than seeing it as a memory drawback. Since different sound clips might be

Table 3: Phenomena and Participants' Accounts

Phenomena	*Accounts*
Reminiscence	"I felt like going back to the adolescence when I was innocent and natural, without business of living. I think of the person who recommended this song, no appearance, but the feeling. It was the ambient sound on the bus last week, just like the past when I went to school...I don't want to figure out the actual place where I made the recording, I just want to be stay in in the past." (P2)
Confabulation	"When this news program is on, I am always having dinner with family, my parents are there. The other clip reminds me of the environment where I watched an erotic movie privately. The remix seems that, one day before, I was watching the erotic movie under the table beside my parents with the serious news program. It was really unbelievable." (P2)
Confabulation	"It seems that I was at the concert, but we were too noisy chatting. It's a gentle song and should be appreciated quietly. The singer seems to be on the stage, right before me." During the whole process, she was rapt in the fictional concert. In fact, the singer has been dead for years before the participant knew his music. "I know it was the conversation two weeks ago, but I can't help mapping it to the concert. I couldn't have any chance to be present there." (P3)

integrated together as occurring in one scenario while the time and space were disordered, some participants began to actively confabulate without the intention to deceive. The sound collage presents a non-existent scene that would invite participants to experience and make meanings. P2 prepared an audio clip of a news program and a self-talk describing an erotic movie. When she heard the remix, she was surprised and jumped up from the chair and shouted that it was impossible (Table 3, roll 2). Sometimes participants were strongly engaged to the fictional scenes. P3 prepared a live song and a conversation with friends and then went into confabulation (Table 3, roll 3). In addition, P1 listened to the sound of subway mixed with recordings in her kitchen, as if she was cooking on the train. Participant 8 said that the music remained him of a boyhood friend so that he seemed to experience meeting the friend at the university restaurant, where the sound was recorded.

The interplay of two types of sounds seems to present a wicked scenario which is both fictional and felt right, like false memory. Participants are likely to believe and experience the fiction emotionally from their own perspectives [6], rather than playing as a role. We think imagination or speculation are not appropriate to describe such fictional but on-site experience. It is neither to participate in a story psychologically nor to think about an alternative realism critically.

Providing motivational factors such as temporality cues as Fotopoulou et al. suggested [6], our counterfactual soundscape that integrates different memories into one scenario would very likely contribute to confabulation. From the field study, confabulation does not only happen without the consciousness, it could also be triggered by artifacts deliberately. Especially in autobiographical memory, it often occurs.

Another issue we are curious about is the self-identity that acts as an experiencing self in the confabulation. It differs from role-playing psychologically. In confabulation, one cannot stop believing that the person in the ridiculous scenario is herself experiencing while listening. In reminiscence and recall, we refer to the working self system (Fig. 3), which indicates a process of modifying self-image through the autobiographical knowledge base. However, in confabulation, the self-image doesn't represent who the individual actually is, but the person might be. In this study, we propose the counterpart self system (red parts in Fig. 3)[10], which indicates a fictional but reflexive self across possible worlds.

Making Confabulation Radio

In the fieldwork we composed the remix on a laptop. Afterwards, we made the artifact Confabulation Radio to further explore the counterfactual soundscape (Fig. 4). A series of sounds were prepared in the SD card beforehand. There are two tracks, one for music clips and the other for recordings, being played at the same time through two MP3 modules. The rotary encoder selects the recordings and the button changes the music clips. When the user changes one track, the other track keeps playing the same tune. In the future work, we will conduct qualitative study by deploying the artifact and inviting participants to use in everyday settings.

Working Self: a process of modifying self-image through the autobiographical knowledge base.

Counterpart Self: a fictional but reflexive self across possible worlds.

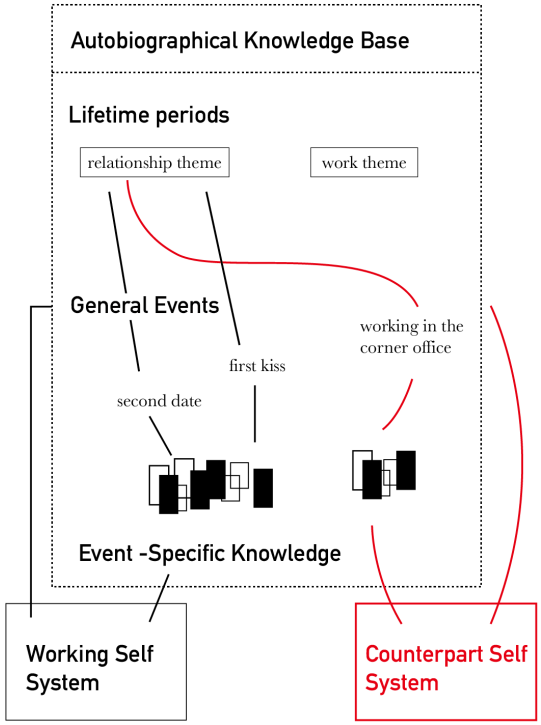

Figure 3: A model of self-defining memories with working self system and counterpart self system (modified from [15]). The red line which combines irrelevant events together indicates the counterpart self system.

REFLECTION AND FUTURE WORK

(1) Possible world with false memory: Judging the authenticity of autobiographical memories can be difficult, since our consciousness could hardly tell the differences between real memories and those we imagine. This might be resulted from the fact that several regions of human brain including the hippocampus are both responsible for recollection of memories and imagination towards future [14]. This overlap between remembering and imagining could explain some kinds of false memories, such as confabulation [12, 14]. Therefore, what if we see false memory as a resource for design? We think it might be an alternative way to construct self-related possible worlds through confabulating with memory and imagination.

(2) Working self and counterpart self: Drawing on autobiographical knowledge system, working self indicates the self-image to help an individual operate effectively in the world. However, the model of working self does not work well in explaining the non-actual self-identity if we deliberately stimulate users with an arbitrary composition of event-specific knowledge, general events, and lifetime periods in a counterfactual way. Our empirical findings show that upon these stimuli participants will not only make meanings as usual but also further create imagination, confabulation, and speculation, in which self-identity seems to be multiple from many other worlds [10]. To explain the phenomenon, we propose the model of counterpart self which accounts for reflexive speculation in possible worlds, and it certainly needs further study in the future.

(3) The horizon of the possible world by confabulation: In addition to creatively making sense of the past, we wonder if confabulation can trigger the future, or an alternative present world. Considering that the sounds we used so far are only actual recordings or familiar music, could we also use fictional sounds to build the sense of rightness? For example, what if we mix people's daily conversation with a sci-fi radio drama? What would we feel if we heard our voices pronouncing a dialogue we never spoke, enabled by gradually maturing text-to-speech systems (e.g., Lyrebird vocal avatar [7])? Through various types of confabulation, to what extent can the horizon of the possible world be expanded?

(4) Possible world machine: We presented a demo version of Confabulation Radio to participants for preliminary feedbacks. We found that with confabulation experience, the tangible artifact had been given some metaphoric meanings, such as time machine where the rotational operation is similar to shifting the time and space, or Pandora's box, which is full of emotion and couldn't control its upcoming contents. These participants' accounts aroused our interest in the relationship between the radio and users. If the radio could update its contents like an IoT object and live with us in domestic settings, how will people treat it? Will it be a counterpart self machine, or a nostalgic time machine? This is another issue we want to explore in the future.

CONCLUSIONS

In sum, we conducted an explorative study to understand if personal experiences of confabulation can contribute to the constitution of possible worlds, and to explore the potential of using mixed soundscapes as a medium to trigger possible-world-experience. The result shows that these mixed

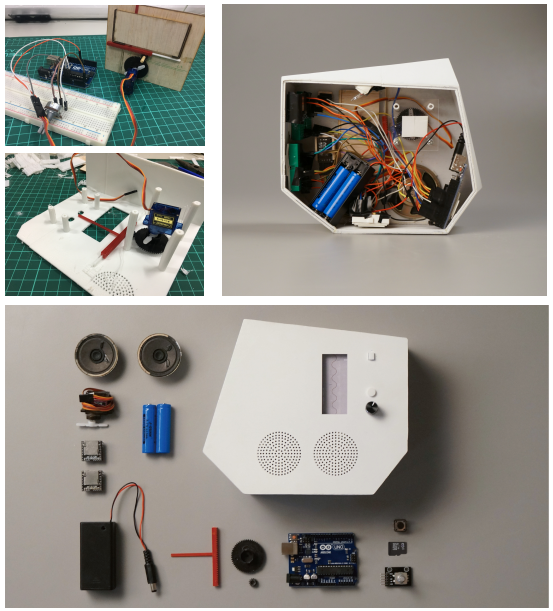

Figure 4: The Confabulation Radio was built with an Arduino Uno micro processing platform linked to two MP3-TF-16Ps, which are small MP3 modules with a simplified output directly to a speaker and an input from the SD card. The Arduino incorporates two MP3-TF-16Ps, a servo motor, a rotary encoder and a button. The rotary encoder is connected with one MP3-TF-16P and the servo motor to control a visual interface for changing the recordings. The button controls the other MP3-TF-16P to randomize music clips. (concept video: https://youtu.be/2sSjUWqU1oI)

ACKNOWLEDGMENTS

This research was supported in part by the Ministry of Science and Technology of Taiwan (MOST 108-2633-E-002-001, 107-2218-E-002-057, & 107-2410-H-011-018-MY2), National Taiwan University, Intel Corporation, and Delta Electronics.

counterfactual soundscapes can create self-convinced experiences of counterpart self. A research artifact, the Confabulation Radio, was crafted based on our model of counterpart self, and further research is required in exploring reflexive speculation and other phenomena as well.

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