

Improvising the Future: An Improvised Theatre Approach to Design Fiction

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ABSTRACT

Human-computer interaction (HCI) research often deals with the question of how to design technology for the future. Design fiction is an ideation and envisioning method which uses narrative fiction to explore and critique possible futures. However, HCI designers are not necessarily fiction writers, limiting design fiction to HCI researchers with training in narrative craft. In this paper, we use improvised theatre to make narrative-based ideation techniques more easily available to designers. Improvised theatre is a form of unscripted live theatre in which actors must create scenes on the spot based on audience input. We created four improvised theatre games designed as ideation methods for new technologies that bring together improvisers and a participating audience of HCI designers. Through these games, performers can explore narratives for new technologies, identifying and inspiring new directions for research.

Author Keywords

Design Fiction; Visions of the Future; Improvised Theatre

INTRODUCTION

Human-computer interaction (HCI) often deals with the question of how to design interactive technology for the future, and the impact it will have on people and society. *Design fiction* is a forward-thinking and visionary approach to ideating and exploring possible technology futures. Grand & Wiedmer [1] define *design fiction* as a strategy for design research which uses design artifacts and performances, among other things, to realize “how the world could be” rather than how the world currently exists. The term was first coined by Bruce Sterling [3] and further developed by Julian Bleeker [10]. Lindley & Coulton [3] argue that design fiction, while powerful, is inherently ambiguous, but its ambiguities are misattributions of its flexibility as a technique. Design fiction has been used over the past decade to study a variety of topics including: data science [4], sensing and tracking technologies [5], industrial-academic collaborations [6], and the practice of design fiction itself [7]. Additionally, Microsoft and Apple have used envisioning videos in *Productivity Future Vision*¹ and *Knowledge Navigator*² to visualize their ambitions and directions for future technologies.

As the term ‘fiction’ implies, a large component of design fiction is writing about what is not currently possible, but what may be worth pursuing as a strategic long-term research

agenda for HCI. However, HCI designers and researchers are not necessarily good fiction writers, limiting design fiction to those with specific expertise in narrative craft. As such, our research aims to develop a method for researchers to create natural narratives so that design fiction is accessible to all regardless of writing skill.

Improvised theatre (improv) is a form of unscripted live theatre in which scenes are created on the spot based on prompts or audience input. At its core, improv exercises an actor’s ability to interpret new ideas and think in the moment [2]. In fast-paced exchanges, the narrative often does not go as any one improviser expects. Improv games are used to warm up actors before performances, acclimate novices to the ‘rules’ of improv, and are sometimes incorporated into the performances themselves [2]. Many games involve word association, the use of props, or creating a scene around given roles or settings. Actors are given a great deal of freedom within a topic, which allows for fun and creative scenes. Our goal was to adapt improv games into a collaborative ideation method in which an audience of HCI designers create improv games or provide prompts for performers to explore narratively, identifying and inspiring new directions for technology.

A similar design technique which has been used in the past is *bodystorming*³. It differs from traditional methods in that it involves prototyping in context [8]. Design sessions are physically carried out “in the wild” rather than in the office [9]. It aims to provide better understanding of new concepts which may be hard to verbally articulate, as well as to tangibly explore possible future human interactions with them [8]. Bodystorming is typically used in the actual setting where the final product is to be used, or in a simulation of it. Designers might act out scenarios in the setting, physically go to the setting to do their work, or build a replica of the setting to better consider the details [8]. Sessions have been found to provide immediate feedback on ideas and to give a more accurate understanding of contextual factors, as well as to be memorable and inspiring [9].

Prior to this project, Mikalauskas et al. [2] conducted a pilot study that explored an adaptation of the improv game *Hitch*

¹<https://www.microsoft.com/en-us/enterprise/productivityvision/default.aspx>

²<https://www.youtube.com/watch?v=hb4AzF6wEoc>

³<http://designresearchtechniques.com/casestudies/bodystorming/>

⁴http://improvenyclopedia.org/games/Hitch_Hiker.html

*Hiker*⁴ as an ideation technique for the design of self-driving cars. In *Self-Driving Car Hitch Hiker*, one performer must portray the role of a self-driving car which picks up another performer, a hitchhiker displaying a strong personality tick or emotion. As new hitchhikers are picked up, all passengers in the car must adopt their trait. The first performer may choose to not adopt the traits and simply react to the scene, so long as it fits the embodiment of the car. When the car is full, it “arrives” at the destination, the first performer leaves, and the remaining performers rotate seats and continue picking up hitchhikers. In the pilot test, HCI designers with little to no improv experience played *Self-Driving Car Hitch Hiker*. Trying to figure out the rules, they found themselves immersed in the game and did not realize how interesting the ideas they had come up with were until afterwards. Overall, the study found that the fun atmosphere created by the game allowed designers to come up with a good range of ideas.

While the pilot study seemed to be effective, the use of *Self-Driving Car Hitch Hiker* is strictly limited to self-driving car research. As such, the primary aim of our research is create additional games for a larger range of topics. These games would be played by experienced improvisers with an HCI designer audience providing suggestions.

METHODOLOGY

We had initially wanted to develop general games that could be applied to any HCI topic, rather than just to one specific technology like *Self-Driving Car Hitch Hiker*. However, we decided to narrow our aim to create additional games for other specific, but varying, topics.

Category	Description
Audience Participation ⁶	The audience is involved during the game to some extent beyond simply providing suggestions.
Characters ⁷	Games which focus on building characters.
Endowment ⁸	Players are attributed with physical, emotional, or other characteristics, or are made to do something or behave in a particular way.
Environment ⁹	Games which teach players to build an environment (i.e. defining where they are and interacting with mimed props in that location).
Narration ¹⁰	Games which focus on storytelling.
Performance ¹¹	Games which are used for performance.

Table 1. Improv game categories chosen to have potential for HCI design. Descriptions from *Improv Encyclopedia*.

⁵<http://improvenyclopedia.org/>

⁶http://improvenyclopedia.org/categories//Audience_Participation.html

⁷<http://improvenyclopedia.org/categories//Characters.html>

⁸<http://improvenyclopedia.org/categories//Endowment.html>

⁹<http://improvenyclopedia.org/categories//Environment.html>

¹⁰<http://improvenyclopedia.org/categories//Narration.html>

¹¹<http://improvenyclopedia.org/categories//Performance.html>

To develop games, we first browsed through improv game categories to identify which had potential and which did not. The *Improv Encyclopedia*⁵ lists 33 non-exclusive categories. We established early on that *games involving an environment or narrative* would likely have the best aptitude for research since having a strong setting and story would be key to building scenarios which could be linked to the real world. Considering other elements which would compose a good technology-based narrative, we narrowed the list down to the six categories seen in Table 1.

Next, we brainstormed a list of 17 up-and-coming HCI topics which might be compatible with our game categories (see Table 2). Our aim was to create games for a wide range of technologies without limitation, so we focused on coming up with as many topics as possible without any particular criteria.

Research area
Autonomous driving/vehicles
Massively multiplayer online role-playing games (MMORPGs)
Online video streaming
Gesture interfaces
Haptic interfaces
Voice interfaces
Virtual reality (VR), augmented reality (AR), extended reality (XR)
Feedback and notifications
Telepresence
Blockchain
Crowdsourcing
Fabrication
3D printing
Technology accessibility
Performer-controlled technology
Cyber security
Artificial intelligence

Table 2. List of HCI research areas to add as possible improv game themes.

We then looked at games within the *Narration* and *Environment* categories, eliminating those we believed would not work and recording the reason why (see Table 3). From these two categories alone, we accepted 19 games, had 14 which might work situationally, and rejected 15. The reasoning for some games showed trends; for example, games which involved creating narratives with no restrictions or gimmicks affecting the storytelling were generally accepted. Seeing that these two categories

Game	Description	Useable?	Reason
Automatic Storytelling ¹²	One group has to guess a story through yes/no questions, and a second group answers. The catch: there actually is no story, and the questions are answered based on some random criteria (e.g. if the sentence starts with a vowel). The story is created through the guesses.	No	Only works one time; once players know how it works it cannot be used again.
Boris ¹³	An interrogator mentions random elements which the suspect needs to incorporate to get himself into more trouble. The imaginary Boris may be used to torture the suspect for bad answers (and prod him to confess further).	No	Involves introducing lots of different elements which might take the focus away from the main technology.
Guest Game ¹⁴	One performer is a guest somewhere. We do not know his identity, purpose, or relationship to others. Everyone in the scene acts suspiciously, like they have a secret. By the end of the scene, the audience should understand the secret.	Maybe	Audience must figure out a secret. Game may work situationally; nothing explicitly qualifies or disqualifies it.
Let's Not ¹⁵	One performer gives suggestions. The second performer either accepts and plays along or refuses the offer. When an offer is refused, it needs to be followed-up with a better offer.	Yes	Ideas can be explored afterwards regardless of if they are used in the scene or not.
Three Sentence Story ¹⁶	Two performers; one gives three unconnected sentences. The other builds the shortest story possible that incorporates the sentences.	Yes	Possible adaptation: build a story from keywords relating to the technology instead of sentences.
Yes, Let's - or Rather Not ¹⁷	Performers are given a location. One performer suggests an action, and all other players either do it, or if they do not like it, step down and sit out. Repeats until one player is left.	No	Game advances by rejecting ideas; not effective for good ideation.

Table 3. Example acceptances or rejections of some games in the *Narration* category. Descriptions from *Improv Encyclopedia*.

provided a sufficiently large pool to sample from, we moved on to considering game adaptations involving our HCI topics, and finally picked four to fully modify and develop. We then analyzed them through a pilot study in which four HCI designers critiqued the games.

RESULTS: OUR IMPROV GAMES

There were two factors we took into account while adapting the games. The first was the roles of the performers and audience in relation to the technology. A performer might act as a user, as the technology, or as a bystander providing social context. The audience, if there was one, might be a co-participant in the scene or may not be involved at all. The second factor we considered was the definition of the technology. There are two cases: either the technology's primary behaviour is known and defined, or it is not (i.e. it is improvised). What we would be trying to accomplish through the games changed drastically based on the level of definition.

Secret Queries (Voice Interfaces)

The original game, *Double Endowment*¹⁸, uses a pre-selected setting and two performers. Each performer is given a task that they need the other to do, but they are not allowed to explicitly tell them. The tasks should fit with the theme of the setting. *Secret Queries* explores artificial intelligence (AI) voice interfaces such as an advanced version of Google or Siri. In it, one performer acts as the voice interface, and the other as the user. We use this game to play with the idea

of how we might teach AI to fulfill indirect orders. For instance, everyday users may have search terms they do not want to explicitly look up, such as diagnosing an embarrassing medical condition or looking into what an ex-lover is up to. Thus, an example task the user might need to make the interface do is Google remedies for a butt rash. Conversely, the voice interface's task might be to subtly advertise a product so that the user decides to go out and buy it. In this version, a setting may be picked, but it is not necessary.

Virtual Reality (VR) Narrative, Colour, Emotion

*Narrative, Colour, Emotion*¹⁹ originally has one performer telling a story. Three other performers can tag the person if they want to hear more narrative (action), emotion, or colour (environmental detail such as temperature, sounds, or colour). *Virtual Reality Narrative Colour, Emotion* takes place in virtual reality. The first performer tells a story all the same, but there may be up to five, and each is interested in a different sense. One might be constantly wondering how things smell, another how things feel, a third how it looks,

¹²http://improvenyclopedia.org/games/Automatic_Storytelling.html

¹³<http://improvenyclopedia.org/games/Boris.html>

¹⁴http://improvenyclopedia.org/games/Guest_Game.html

¹⁵http://improvenyclopedia.org/games/Lets_Not.html

¹⁶http://improvenyclopedia.org/games/Three_Sentence_Story.html

¹⁷http://improvenyclopedia.org/games/Yes_Lets_-_or_Rather_Not.html

¹⁸http://improvenyclopedia.org/games/Double_Endowment.html

¹⁹http://improvenyclopedia.org/games/Narrative_Color_Emotion.html

and so on. A designer's goal in this game would be to develop virtual environments in detail.

Telepresence Points of View

In the original *Point of View*²⁰, a simple scene is acted out. Then, the scene is replayed from the point of view of one of the characters. The scene may be replayed several times from several points of view. We developed *Telepresence Points of View* to explore telepresence. A scene might involve two parties in a video call. Then, the scene can be replayed from either side of the call to see what was happening in the background. This version of the game can be used to see what the call picks up and what it does not, as well as how video calls are used in the real world.

Silent Gesture Interface

*Touch to Talk*²¹ requires performers to act out a scene with the restriction that they can only speak when they touch each other. *Silent Gesture Interface* is used to explore technology accessibility in voice or gesture interfaces. We kept the idea of the restriction in communication but added a goal the performers must achieve together. One improviser plays a user unable to issue voice commands – for example, due to excessive noise, or a need to stay silent to not disturb others. Another performer acts as a gesture interface. Their task might be to bake a cake together: the “interface” performer would supply the recipe, but the user can only navigate using certain gestures that the interface would then have to interpret. The task given might be predetermined or can be given by the audience. The audience may also choose to specify a setting.

DISCUSSION

Traditionally, the success or failure of an improv game is entirely subjective. Since there is no clear goal from the outset, improvisers are encouraged to explore strange territory and be unafraid of failure. However, for our purposes, we defined the failure of a game as the inability to inspire meaningful discussion about the research topic.

²⁰http://improvcyclopedia.org/games/Point_of_View.html

²¹http://improvcyclopedia.org/games/Touch_to_Talk.html

Conversely, success meant that the game was able to raise new ideas or highlight emerging issues toward the development or use of the technology.

Before finalizing our modifications, we ran a pilot study where four HCI designers critiqued the games. We found that even without playing, simply discussing how the games could be used enabled designers to come up with a wide range of ideas and topics. For instance, when discussing the adaptation of *Point of View*, the idea from the start was already to base it around some sort of telepresence scenario, initially assumed to be video calling. However, during the critique we were able to flesh out further details such as the purpose of the video call (i.e. casual conversation or remote collaboration), other forms of telepresence such as online streaming, and possible mediums such as laptops or telepresence robots. We were also able to make a general realization that any game must impose limits on the improvisers—we want ideas that are realistic and achievable in the foreseeable future. The ideas from the critique were used to refine the games and create the final versions described in this paper. Though it was not through actually playing them, the games were successfully able to generate meaningful discussion about the proposed HCI topics.

Overall, our critique session yielded good results. Our approach of modifying improv games is certainly viable and promising; however, there are limitations to what we did. Some of the games we designed feature very specific scenarios, and due to time constraints and scheduling conflicts we were unable to actually play test them. We looked at both improv games and research topics in search of suitable pairings, but an approach which might have better potential use in the real world could be to know what topics to research from the beginning and search only for games. Categories and games which we had disqualified might useable for these topics, so search criteria would have to be reconsidered as well. Another constraint is the inability to quantitatively measure our results. Just as creativity cannot be measured on a scale, ideation is also unmeasurable. Any results we get must be assessed subjectively, though it can be

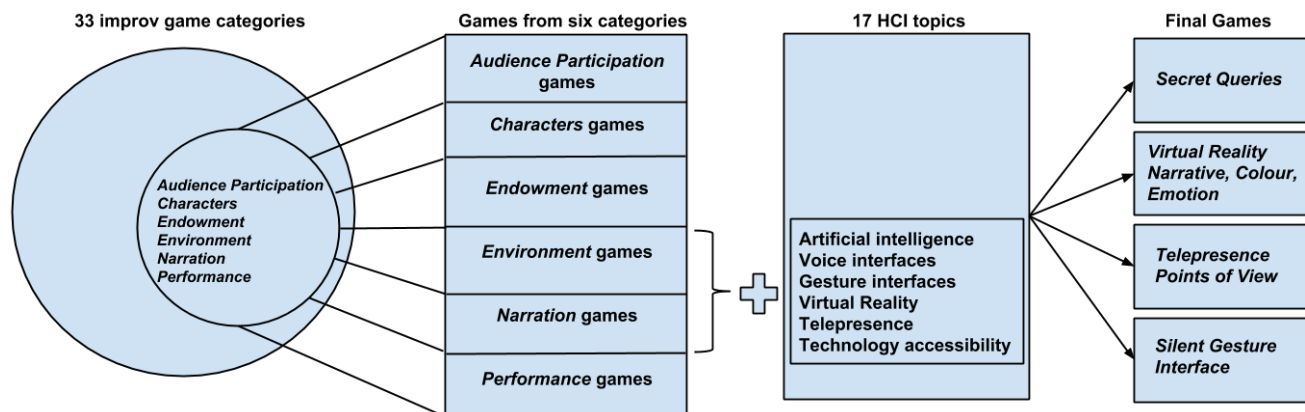


Figure 1. The components of our process for adapting improv games to explore HCI topics.

argued that qualitative assessment is enough for mere ideation.

CONCLUSION

Future follow-up work may involve designing games for an even wider range of topics, or developing a general design method to create the games and testing their use for actual research and design. In this project we studied design fictions, visions for future technology, improvised theatre games, and looked into a broad range of HCI topics. Before taking this course, the term “research” only implied exploring and analyzing the topics themselves. However, working on this project has shed light on the importance of creating effective design methods in research.

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