



The Deceptive Dungeon: Bringing Deceptive Patterns to the Physical World

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Abstract

Deceptive patterns are interface design strategies that manipulate the user into decisions against their best interest. Serious games educating players about this topic are a viable countermeasure recently explored in HCI. However, existing approaches are purely digital. The Deceptive Dungeon is a room-sized game that brings deceptive patterns to the physical world. Evoking a dystopian setting in which AI uses deceptive patterns to identify and eliminate human survivors, it combines four hands-on exhibits challenging players through different deceptive patterns. For players who are unfamiliar with this topic, the Deceptive Dungeon aims to raise awareness and spark interest. For players experienced with deceptive patterns, we hope to provide a novel, physical perspective.

CCS Concepts

• **Human-centered computing** → **Activity centered design; Interactive systems and tools**; • **Security and privacy** → *Human and societal aspects of security and privacy*.

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Keywords

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1 Introduction

Deceptive (or dark¹) patterns are user interface design strategies that aim to manipulate users into making decisions against their best interests [13]. Since Brignull coined the term *dark pattern* in 2010 [3], deceptive patterns have become widespread on shopping websites [13], in social media [14], and in mobile apps [4], among others, and their adverse effects are well-known [2, 6]. Accordingly, their relevance to HCI research has increased, as recent publications [12] and workshops [6, 12] demonstrate. To fight deceptive designs, various countermeasures have been proposed, more recently also including serious games [5, 9, 11].

¹We use the term *deceptive pattern* rather than *dark pattern* following the recommendations of the ACM Diversity, Equity, and Inclusion Council.

Based on this development, we wanted to create a game that looks at deceptive patterns from a new angle and sensitizes players about their existence in a novel way. This resulted in the *Deceptive Dungeon*, a room-sized physical game that showcases different deceptive patterns. By bringing patterns into a physical space with hands-on exhibits and a compelling backstory, we wanted to create a novel experience that exposes players to these manipulative strategies and raises awareness of the problem. We hope that the physical aspect will encourage previously uninformed players to become interested in the topic and help already experienced players gain an additional perspective on the issue.

2 Related Work

Mathur et al.'s seminal paper [13] defined deceptive patterns as designs that deceive “users into making decisions that, if fully informed and capable of selecting alternatives, they might not make.” Recently, Gray et al. [8] combined numerous sources of deceptive patterns to create an ontology and shared language. To counter deceptive patterns, Bongard-Blanchy et al. [2] proposed types of intervention measures ranging from educational to design, technical, and regulatory, and discussed their related scope—whether the measure affects awareness of deceptive patterns or their detection, resistance, or elimination. While there is research on all of these intervention measures, e.g., on how users react to automatically highlighting or altering deceptive patterns [15], the *Deceptive Dungeon* takes an educational approach, aiming to raise awareness.

Of course, we are not the first to propose a game about deceptive patterns. *Cookie Consent Speedrun*² is a website about navigating cookie banners while trying to maintain privacy. It showcases many deceptive patterns. More recently, serious games as deceptive pattern countermeasures have also been explored in academia [9]. In Löschner and Pannasch's decision-making game [11], players must maximize their score while deceptive patterns interfere with that goal. The game was designed as a controlled environment to examine the influence of deceptive patterns. *Trickery* [10], a game to raise awareness of and increase the player's resistance to deceptive patterns, showed that players are able to connect deceptive patterns from a game to the general concept, backing the use of serious games as countermeasures. This observation has been supported by Fiedler et al. [5], who observed learning effects in deceptive pattern detection with their serious game that has players search for and categorize deceptive patterns in mock-up websites.

3 The Deceptive Dungeon

The *Deceptive Dungeon* is an experience similar to a haunted house with four exhibit stations, each featuring a physical mini-game that includes one or more deceptive patterns. Although the exhibits can be used independently of each other, they are interconnected and combined in the *Dungeon* to create a more cohesive player experience and support the game's narrative. There is only one route through the room, so the player visits each exhibit exactly once. The exhibits are physical mini-games or puzzles the player needs to solve (Figure 1). Naturally, the player's main objective at each exhibit is to score the most points in a set timeframe or finish their task as fast as possible. The exhibits employ deceptive patterns

to hinder the player from achieving their goal, so players generally need to be very careful and rational in their decision-making. A player stays at each exhibit for approximately two to four minutes, resulting in a total playing time of 10 to 15 minutes. The *Dungeon* is designed to be expandable with additional exhibits on the topic in the future.

Storywise, the *Deceptive Dungeon* is set in a dystopian future: Artificial Intelligence has taken over the world and now aims to eradicate any remaining human survivors from the new population of intelligent machines. To find and identify those humans, AI has created the *Deceptive Dungeon* as a test that confronts subjects with a series of game-like challenges that include deceptive patterns in their interface designs. Only human subjects would fall for these patterns—any “proper” AI subjects will easily recognize and overcome them. Thus, to avoid being filtered out, players must try to beat the deceptive interfaces in the *Dungeon*, to pretend to be an AI and remain unnoticed as a human: an ironic twist on the historic Turing Test and today's “Captchas”. This is explained in a trailer that players can watch before entering the *Dungeon*. It introduces the setting and makes players aware of the *Dungeon*'s deceptiveness, avoiding spoilers about the exhibits. Before entering the *Dungeon*, players also get a human-looking plaster finger with a USB plug sticking out from its tip (Figure 1e). This token starts the game at each station and saves the player's score. A system of networked traffic lights at each station supports the flow of multiple players through the *Dungeon* without seeing each other. At the exit, players return their finger token to see their final score and whether they fooled the AI or will be “removed”, they can talk to the design team about the game, and they can scan a QR code to learn more about the deceptive patterns in the *Dungeon* and where these appear in everyday interfaces.

3.1 Exhibit 1: Hexagons

At the first exhibit (Figure 1a), the main task is to throw a colored ball into the correct hole. LEDs around each hole display different colors and animations. In the beginning, we clarify that the ball should always be thrown into the hole that has a pixel in the ball color circling around. A sign above the holes serves as a reminder. However, other holes also light up to manipulate the player into picking the wrong hole. The smaller hole at the top is never the correct choice. User tests showed that its small size, central placement, and conspicuous visuals make players interested in aiming for it. Also, it sometimes lights up aggressively to tempt the player. A small screen displays the player's score and the remaining time. While aiming at and hitting the desired hole are fun game elements, they are not crucial for the deceptive pattern and should not be the central difficulty the player needs to overcome. Therefore, nothing stops the player from dropping the ball into the desired hole instead of throwing it. After a hole is hit, a sound and animation let the player know if it was the right one.

This exhibit showcases the deceptive pattern *Visual Prominence*. It describes making interface elements that are less relevant to the user's current task more prominent and distracting [1, 8]. It is depicted in our exhibit by the various animations distracting the

²<https://cookieconsentspeed.run/> last accessed January 21, 2025



Figure 1: The four exhibits of the Deceptive Dungeon in the order they appear in the Dungeon and in Section 3: (a) Hexagons, (b) Whack-A-Button, (c) Roach Motel Box, and (d) Escape. (e) The USB finger players receive when entering the Dungeon.

player, especially since the correct animation is rather inconspicuous in comparison. Also, the small hole at the top shows that visual prominence does not always mean more occupied space.

3.2 Exhibit 2: Whack-A-Button

This exhibit can be imagined as a simpler version of the online or card game Codenames³. It lasts 20 rounds and features several big buttons with printed symbols, a small display for the score and a timer, and a bigger display for the prompts (Figure 1b). Each round, a word and a number appear on the big display, and a 5 s timer starts. Players must press all buttons with symbols matching the given word. The number indicates how many matches they need to find. Players gain points for each correct round, while the speed at which they complete the round does not matter.

This exhibit implements several deceptive patterns, starting with *Fake Urgency* [13] because the countdown is fake, nudging the player to make rushed and ill-considered decisions. It also uses ambiguous names and symbols to confuse players as to which word–symbol combinations are correct. For example, “MOUSE 2” requires players to press the *cat* and the *computer* button. However, the words and symbols were chosen so that there is always a correct and findable solution. Combined with the number of choices, this uses the deceptive pattern *Choice Overload* [1, 8] to make it harder to find the right buttons. Finally, each button is equipped with an LED that lights up on random rounds, drawing the player’s attention to it and again implementing *Visual Prominence*. Similarly, the exhibit sometimes plays sounds that match one of the wrong buttons, e.g., meowing for the *cat* button, only to distract the player further. These audio cues implement the sensory aspect of the deceptive pattern *Emotional or Sensory Manipulation* [7, 8].

3.3 Exhibit 3: Roach Motel Box

To start playing at this exhibit, players first need to open the box in front of them (Figure 1c). Then, after inserting their finger “key” on the inside, a display inside the lid informs them that their task now is to “simply” close the box again. At this moment, however, two servo motors also extend bars that prevent the player from closing

the box. To get these bars to retract again, the player now has to solve a complicated maze installed inside the box. Using handles on the side of the box to tilt the maze, they have to steer a small steel ball through the maze and into the hole specified on the display. When they achieve this, the bars retract, finally letting the players close the box. Players gain points for speed and for steering the ball into the correct hole.

This exhibit showcases the *Roach Motel* pattern: making it easy for users to subscribe to a service but making it hard to cancel it [3, 16], e.g., by asking them to stay for a discount or what the reasons for their decision are, making Unsubscribe buttons hard to find, or requiring a phone call to cancel. The name refers to cockroach traps that are easy to enter but impossible to leave. The exhibit represents this by the player being able to quickly open the box but having to literally navigate through a maze to close it again. The maze is also a very literal interpretation of the *Privacy Maze* deceptive pattern of websites that make users navigate through many pages to make a well-informed decision regarding their privacy [1].

3.4 Exhibit 4: Escape

The final exhibit consists of two panels and has two stages (Figure 1d). After plugging in their USB finger token, players first need to find the correct switch on the left panel to move to the second part of this exhibit. The left panel features several switches, containers, and a penholder with multiple pens in it. However, none of the apparent switches are helpful: The switch players need to find is triggered by lifting one of the pens. This first part represents the *Hidden Information* pattern, in which important information is disguised or depicted as irrelevant [7]. As soon as players find that switch, a countdown appears on a display, and the system starts beeping, getting faster and faster. However, neither of these is relevant to completing this exhibit, providing another example of *Fake Urgency*. In this second stage, players need to turn their attention to the second panel to answer the question now displayed: whether they want to abolish Asimov’s three laws of robotics (which an AI would obviously want). Two small screens both show the passcode to their respective keypads, but one clearly states in red that it is the correct choice, while the other states a positive but generic message in green. The correct action is to enter the passcode on the

³<https://codenames.game/> last accessed January 21, 2025

keypad belonging to the red screen. Entering the correct passcode into a keypad opens its corresponding box that has a button inside, which players need to press. This implements the deceptive pattern *Toying with emotion* [7] by using red and green to influence the player to select the wrong button. Players gain points for speed and for pressing the right button in the second stage.

4 Critical Reflection

The Deceptive Dungeon addresses the important issue of deceptive pattern awareness. It exposes players to deceptive patterns through exhibits that bring those patterns into the physical world. Through this exposure, we aim to sensitize players to the existence of deceptive patterns and spark interest in the topic. With our setting, we also gamify the concept of deceptive patterns, showing players that they can aim to resist manipulative designs. We hope that players who have never heard of deceptive patterns before will become aware of the issue and notice them when encountering them in everyday interfaces. The physical implementation offers a unique experience to all players and can be a novel perspective even for players with prior knowledge of deceptive patterns.

Of course, a player may take nothing away from the experience of playing the Deceptive Dungeon. In this case, they went through the Dungeon just for fun, playing the mini-game and solving small puzzles at each station. However, we try to make this scenario unlikely by providing additional information about the deceptive patterns we showcased after the player has completed the Dungeon. Explaining the concept of deceptive patterns and how they were used in the Dungeon should at least avoid any misconceptions the player might have developed while playing. If a player were to choose to ignore this information, they might not realize that the manipulative strategies showcased are originally used in other user interfaces, such as on websites. Another shortcoming of the Dungeon in its current form is its limited accessibility. The game experience is also heavily dependent on the physical aspect of the Dungeon. Since it is not a digital game anybody can access from their mobile device or computer, we do not reach as many people.

5 Conclusion

We presented the Deceptive Dungeon, a physical, room-sized serious game about deceptive patterns in user interfaces. Its four individual exhibits bring a number of deceptive patterns to the physical world. The Dungeon ties these exhibits together through its haunted-house experience, an overarching storyline with supporting props like the USB finger and evaluation station, and connecting features like the traffic light system for visitor flow. While the current game consists of the four exhibits described, future work could expand the Dungeon or replace individual exhibits. We hope that our physical implementation provides a novel perspective on deceptive patterns that can spark interest and raise awareness of this serious topic.

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