

Without Pride, Without Prejudice: Design Lessons from Fictional Human-AI Interaction

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Figure 1: This frame is an example of human-AI multimodal learning interactions in public settings. The AI agent named VOX takes initiative in accessing and visualizing the writings by Asimov, Wells, Ellison, and Hartdegen. Ironically, VOX is interacting with Alexander Hartdegen, the fictional character in the film. The Time Machine (Simon Wells, 2002), 00:32:05 [9].

ABSTRACT

In this paper, we propose an explorative method for synthesizing design lessons from science fiction which we call Diegetic Design Extraction (DDE). Our current research focuses on conversational Artificial Intelligence (AI) agents that support multimodal learning in public environments. We selected the New York Library scene from the 2002 movie *The Time Machine* [9] (see Figure 1). Our qualitative analysis focuses on turn-taking and the role of silence between the human and the AI. The results synthesize design lessons for functional multimodal silence in human-AI interaction.

Index Terms: SciFi-Vis, human-AI interaction, visualization, science fiction, interaction design, design fiction, AI guides, AI learning companions, Diegetic Design Extraction (DDE).

1 INTRODUCTION

Bleecker developed *Design Fiction* as an approach for using speculative artifacts and scenarios to explore possible technologies and their sociotechnical implications [1]. Kirby introduced *Diegetic Prototypes* to describe fictional technologies that exist as functioning objects within narrative worlds and demonstrate their potential use and implications [6]. Inspired by these methods, we propose *Diegetic Design Extraction (DDE)*, an explorative method for analyzing interaction patterns with fictional technologies to synthesize lessons for real-world implementations.

Science fiction in moving-image media (from now, SciFi) is a rich source of embedded technological interactions that may not exist in our current reality. We showcase the potential steps and results of DDE through a SciFi case study focused on multimodal AI guides for public learning environments, our current real-world research.

Designing these systems involves more than generating correct answers. An AI guide must decide when to speak, respond to interruptions, and interpret the meaning behind a user’s silence. If the AI is visible, designers must also consider visual appearance and statements.

Through DDE, we focus on VOX, the holographic library guide in *The Time Machine* (2002) [9]. Through qualitative analysis of the library scene, we examine silence, turn-taking, conversational initiative, and embodied behavior, extracting lessons for design.

2 SUGGESTED STEPS FOR DIEGETIC DESIGN EXTRACTION (DDE)

We first identified the design space of interest, focusing on AI guides in learning contexts and, more specifically, multimodal turn-taking and the role of silence. We then explored SciFi to find relevant examples, individually, collaboratively, and with AI assistance, and selected scenes that matched our design space. After a preliminary review ensuring interaction richness, we defined the dimensions of analysis to create a design-space coding framework. Then, each of the two authors independently coded the scene using the framework. The resulting codes were merged by a third party, identifying convergence and divergence. Subsequently, the merged results were discussed and interpreted. Finally, we extracted design lessons informing real-world AI guide research.

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Figure 2: JARVIS, a disembodied AI assistant, supporting Tony Stark through voice and heads-up display visualizations inside the suit’s helmet in *Iron Man* (2008), 01:02:11 [3].



Figure 3: Huyang, a robotic instructor, guiding young Jedi learners through speech, gestures, and visualizations in *Star Wars: The Clone Wars*, Season 5, Episode 7, “A Test of Strength,” 00:02:05 [7].

2.1 Define the design space and find examples in SciFi

We use the term AI guide to describe an AI character that helps humans learn, solve, or investigate. For identifying candidate examples, we considered AI guides that display some degree of agency rather than only following instructions, for example, by asking questions, offering alternatives, or contradicting the user.

From more than 60 AI guide examples identified, we selected JARVIS, Huyang, Janeway, Baymax, and VOX. JARVIS is a disembodied assistant that supports Tony Stark’s activities, responding to both explicit and implicit needs through voice and visualizations (see Figure 2) [3].

Huyang serves as a robotic teacher who observes learners, provides feedback, and responds to nonverbal cues (see Figure 3) [7].

Hologram Janeway functions as a training guide, using embodiment, emotion, and environmental awareness to support learning (see Figure 4) [4].

Baymax, in contrast, is a healthcare robotic companion that diagnoses, explains, recommends, and comforts (see Figure 5) [5].

These examples show how fictional AI guides across media can differ in their roles, personalities, conversational styles, and forms of embodiment, including voices, screens, holograms, and physical robots.

2.2 Select scene(s) matching the design space

Among these examples, we selected the library scene with VOX because it brought together several characteristics relevant to our case study within a single interaction sequence: spoken dialogue, visible embodiment, visualizations, a guide-like role in a learning context,



Figure 4: Hologram Janeway interacting with crew members through voice and a visualization interface in *Star Trek: Prodigy*, Season 1, Episode 17, “Ghost in the Machine,” 00:06:07 [4].

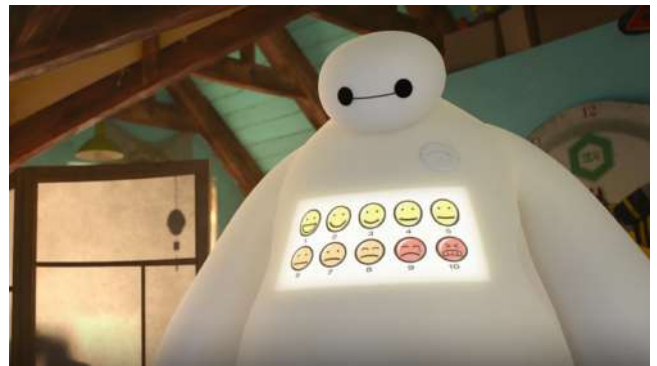


Figure 5: Baymax, a healthcare robotic assistant, diagnosing level of pain through voice and visual representations projected on its chest in *Big Hero 6* (2014), 00:27:05 [5].

and several contrasting uses of silence and turn-taking. VOX has broad knowledge, responds contextually, and suggests other options of inquiry. Critical to our design space, VOX knows when to remain silent even if the user is silent. Impressively, VOX is aware of the consequences of eliminating silence in the conversation. In previous research, we found that correctly handling user silence remains difficult for current conversational AI systems [2].

2.3 Define the dimensions of analysis to create a coding framework

We defined a table for analysis where the rows are conversational instances between character silences. The dimensions of analysis include the type of silence, the actions and reactions of VOX and Alexander, and the interpreted function of the silence, meaning what purpose the coder thinks it serves. The table also records the start and end of each interaction between silences.

2.4 Codify the scene independently and merge the codes

Following the protocol, we interpreted the “type and function of silence” with improvised codes based on the judgement of each coder. We produced two independent code tables and presented them to a third-party analyst to merge the codes. In this paper, the third-party analyst is the large language model, ChatGPT 5.6 Sol [8]. Finally, we manually verified and modified the results of the analysis. Table 1 shows the merged analysis of the 00:31:39–00:31:58 segment as an example of the coding and merging process.

Table 1: Merged analysis of a 19-second segment (00:31:39–00:31:58) from the selected *The Time Machine* scene.

Timestamp	Alexander’s actions	VOX’s actions	Silence type	Function of silence
00:31:39–00:31:44	Waits for information and then clarifies that he means practical applications rather than science fiction.	Uses facial expression and tone that appear judgmental or annoyed.	Judging / annoyance silence	Non-verbal behavior gives the silence an expressive, non-neutral quality.
00:31:44–00:31:49	Continues clarifying why he is asking about changing the past.	Remains briefly silent, appearing surprised or confused and to be processing the clarification.	Confusion / processing silence	Gives Alexander space to elaborate while VOX appears to process the clarification.
00:31:49–00:31:52	Listens to VOX’s response.	Verbally answers the question.	No silence	Direct information delivery.
00:31:52–00:31:58	Continues pursuing the question and follows VOX.	Begins moving away and responds dismissively.	Impatient / disengaging silence	Signals withdrawal rather than supportive conversational space.

2.5 Discuss and synthesize the main design lessons

We studied the merged coding and selected interactions exemplifying design choices. Characteristics of these interactions help refine the dimensions of analysis, for instance by considering the AI character’s levels of embodiment, talkativeness, attentiveness, and use of visualization. Finally, we synthesized the most valuable design lessons from the selected interactions. It is important to note that the coding framework may evolve during and after the analysis, potentially requiring further rounds of coding and merging.

3 PRELIMINARY DESIGN LESSONS EXTRACTED FROM OUR CASE STUDY APPLYING DDE

The scene is split into two parts. During the first phase of the scene (00:30:12–00:31:38), VOX is helpful. It knows when to hold silence. From examples in this part of the scene, we propose that the AI guide’s silence serves multiple functions. These include signaling turn-taking, recovering from misunderstandings, holding a prompt, and allowing the human to process information and formulate new queries. These moments are driven by verbal silence and complemented by non-verbal statements. For example, VOX stays quiet but clearly follows Alexander’s movements with its eyes as if it is expecting a request.

During the second phase of the scene (00:31:39–00:32:57), VOX reacts as if science fiction is not an interesting query and it uses “halting silence” (silence signaling the conversation is over) and, ironically, “uninterruptible absence of silence” (singing) to communicate that it is no longer interested in the conversation. Non-verbal statements such as facial gestures of annoyance complement “halting silence”. A complete treatment of the types and functions of SciFi AI silence is beyond the scope of this paper.

3.1 Main design lessons

1. **Use silence deliberately.** Silence supports turn-taking, sense-making, clarification, and question formulation.
2. **Preserve user agency.** Leave space for interruption, clarification, and conversational repair.
3. **Design silence multimodally.** Gaze, gestures, interactive visualizations, and expressions shape whether silence feels supportive or dismissive.
4. **Prioritize curiosity over prejudice.** All queries are valid, and the user should not be made to feel ignorant or frivolous by AI.

3.2 Open for discussion

In this paper, we have presented the early stage of a method for analysis. Our goal is to engage the SciFi-Vis IEEE 2026 workshop

participants in a creative discussion around the topics raised here. From this discussion, our aim is to improve the method.

While we have many points to discuss, here we would like to highlight what was most surprising to us. We accept that the primary purpose of SciFi is to entertain. VOX’s behavior is what the audience expects only while it considers the user’s queries worth its time, otherwise it quickly turns into an annoying character. This is not logical in real-world design. Yet, it clearly dramatizes Alexander’s ongoing frustration with temporal paradoxes. Surprisingly, even when exaggerated, the interaction can yield important lessons. One of our main design lessons came from this exaggeration. During both parts of the scene, VOX never combines verbal and non-verbal silence. If a machine is not talking or signaling using other channels, it is indistinguishable from dead. For VOX, it is better to be annoying than dead!

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