Blue Lacuna: Lessons Learned Writing the World's Longest Interactive Fiction

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Abstract—*Blue Lacuna* is a new long form interactive fiction comprising nearly 400,000 words of prose and natural language source code. The longest work yet produced in the Inform 7 language, it is also among the most substantial text-based story games in existence, an interactive novel with an average play time of fifteen to twenty hours. In development between 2006 and 2009, *Blue Lacuna* features several experiments of potential interest to creators of long-form interactive stories. This paper describes these experiments and performs an anecdotal post-mortem on what succeeded and failed in the project's realization. I focus on how successful I was at achieving my three principal goals: 1) creating a character able to form a complex relationship with the player across the span of a novel-length story, 2) telling a story which revolves around the player's ability to make choices with real dramatic repercussions, and 3) simplifying the IF interface so those unfamiliar with the medium can easily participate. Among the mechanics discussed are *Blue Lacuna*'s streamlined keyword-based system for entering commands, its attempts to match a much broader range of input styles than traditional IF, and various techniques to adapt the story to include the player's narrative goals, such as tracking which character the player likely thinks the story is about. I also discuss the design of the story's central character, a mentally unstable castaway named Progue, who evolves into one of twelve archetypes (such as friend, mentor, lover, or sycophant) based on the way the player treats him during 70 potential scenes across ten chapters of story. Readers have made *Lacuna* into many stories, providing an example of my belief that the author of an interactive story is like a parent passing building blocks to a child, hoping for a collaboration that will surprise and delight them both.

Index Terms—interactive fiction, electronic literature, Inform 7

I. Introduction

Blue Lacuna, an interactive novel containing nearly 400,000 words of prose and Inform 7 source code, is the longest work yet produced in that language and one of the more substantial works of textual interactive fiction (IF) in existence. While most contemporary IF works are short form (finishable in two hours or less), a complete traversal of *Lacuna* requires on average over three thousand moves and fifteen to twenty hours of time, making the experience much more akin to reading a novel than a short story. The narrative structure also suggests a novel's complexity, with multiple themes and characters developed across a series of geographically and sometimes temporally disparate scenes.[6]

While long form IF was commercially released during the 1980s, the modern hobbyist era has seen far fewer epic-scale works. IF story file sizes and word counts can now be significantly larger than they were twenty years ago (Marc

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Blank's 1982 mystery *Deadline* fit in 123K, whereas Jon Ingold's 2009 mystery *Make It Good* required 496K) but for the most part this growth has been in breadth, not depth: *Make It Good* is not a longer mystery, just a significantly more detailed one. *Blue Lacuna* attempts to be both broader and deeper, providing a richly implemented story world that players can explore across multiple sessions as they move through a ten chapter story.

I had three principal goals when I began working on *Lacuna* in 2006. First, I wanted create a non-player character (NPC) who the player could develop a unique and personal relationship with across a traversal of the story, and whose character arc is not predestined but rather determined by the nature of this relationship. Second, I wanted tell a story that revolved around and relied upon the player's ability to make serious choices with dramatic repercussions, without sacrificing the authorial need to tell a compelling and coherent story. Third, I hoped create a more intuitive interface for IF that required less instruction for those unfamiliar with the form. I'll discuss each of these goals in some detail, and explain how I met or failed to meet my objectives in each.

In a larger sense, my hope was to create an interactive story where the player was not just choosing which of several static texts to view, but could legitimately feel like a co-author, meaningfully participating in the telling of the story. I'll reflect on *Lacuna*'s effectiveness on this front throughout and in my conclusion.

II. Building Relationships with Non-player Characters

Non-player characters in IF have been companions through large portions of a narrative (as early as Floyd in Steve Meretzky's 1983 *Planetfall*) as well as sophisticated conversationalists (as in Emily Short's 2009 *Alabaster*). However, most conversationally sophisticated NPCs appear only in single scenes, while most NPCs who spend large portions of time with the player are not conversationally sophisticated. One of *Lacuna*'s major accomplishments is Progue, an NPC who attempts to be both: a dynamic conversationalist who grows and changes according to the player's interactions with him over the course of a long form story.

Progue is a shipwreck victim with a tragic past who believes the player is a hallucination when they first meet. Mentally unstable, and speaking in a rhythmic, lyrical patois, his relationship with the player can grow from this inauspicious beginning into a friendship, a rivalry, a romance, or one of nine other archetypes by the story's conclusion, which have a profound effect on the ultimate resolution

and meaning of his character arc and the overall narrative.

A. Conversation System

Lacuna features a custom system for conversing with NPCs based around the concept that real conversations are always moving forward. Each conversation **beat** (a paragraph-length NPC discussion of a topic) can suggest one or more further beats for discussion[1]. Suggested beats are displayed to the player in a window below the command prompt which appears only during conversation. The player may select any available beat to steer the conversation in a desired direction. However, each suggested beat will expire after a few turns, giving the impression that the conversation is always moving forward and newly introduced topics are only relevant for discussion for a short time.

This basic framework is enhanced by a number of additions that further the illusion of a dynamic conversation partner. Some beats can be marked as insistent, meaning the NPC will not allow the player to change the subject until they get an answer to a question. If the player remains silent, the NPC can take advantage of the opportunity to steer the conversation in a new direction. Some beats will enqueue other beats to appear later in the discussion. If the player walks away during a conversation, an interested NPC can follow and press the point. Players can also try physical actions during conversation, which are categorized into four basic types: hitting, pushing, touching, or kissing. NPCs will respond appropriately to these physical actions based on context and past behavior.

Over 1200 beats were written for *Blue Lacuna*, the majority for the seventy unique conversation scenes that Progue can appear in. Here's the sample code for one beat:

```
Understand "chasm/stairs" as dc_bridge when last beat is
    in DenialC. dc_bridge is a beat in DenialC with fuse
    5 and keyword name "chasm" and reaction "'Moisty
    sausages, [animal-nickname], I'd stay away from that
    part of the island, were I be you,' [the Progue]
    warns, [attitude-business]. 'Leave and believe,
    there's nothing interesting on the other side of that
    chasm anyway, and the [dc_creeper] lives to prowl for
    victims over therewards. Stay in the beach and on the
    [dc_marsh] like I do! Only way to be safe.'". the
    bridge references dc_bridge.
```

Depending on the player's traversal of the story so far, this might produce output like the following:

> "Moisty sausages, duckling, I'd stay away from that part of the island, were I be you," he warns, frowning disapprovingly at you. "Leave and believe, there's nothing interesting on the other side of that chasm anyway, and the **Creeper** lives to prowl for victims over therewards. Stay in the beach and on the **marsh** like I do! Only way to be safe."

[1] The term "beat" it not meant as a direct reference to other uses of this term in screenwriting or interactive storytelling circles. In *Lacuna* it simply means a moment of dialogue which the player can respond to by selecting the next beat for discussion.

This beat, dc_bridge, is a member of a group of beats called DenialC (Denial Conversation, keyed to casual conversations when Progue is still in the "denial" emotional stage). It's made available for conversation after the player has discovered the bridge object in the story world (via the "references" relation in the excerpt's final sentence). Two additional beats, dc_creeper and dc_marsh, are suggested here, giving the player two additional avenues of conversation to pursue from this moment (in addition to beats suggested in the previous few moves which have not yet expired).

As seen, Progue's dialogue is frequently customized to the player's unique circumstances at the level of words and sentences. The above fragment include two routines, animal-nickname and attitude-business, that display custom text based on past relationships. Progue develops a pet name for the player based on the particulars of their relationship, and is described as frowning disapprovingly because he feels paternal and protective towards the player in this traversal. Other texts that might have appeared here in different traversals include "tousling your hair playfully," "watching nervously for your reaction," and "studiously avoiding your glance." attitude-business can produce 56 different messages.

Several other similar substitutions exist to further personalize Progue's text. Progue has seventeen different behaviors he can engage in as he moves around the island: he might be fishing when this conversation happens, and beats invoking the animus-business routine might produce a text like "twitching the line absently with his finger." He remembers the previous conversation, and might greet an approaching player with a text like "Been thinking a lot about our walk on the beach." He might squint into the setting sun or curl his toes in the sand or cringe fearfully as you approach: in every case, the description is a result of the player-created context in which he is encountered.

Consequently, each player develops a unique and personal relationship with Progue. Even though any two players will see a certain amount of overlapping dialogue, the context and meaning of that dialogue will vary based on that player's unique circumstances. This is one of many factors designed to help a player "own" her version of the story.

B. Progue's Psyche

While the methods described above produce local variation in Progue's text, the player also can influence the large-scale development of his character. As the narrative progresses, Progue moves through six psychological stages triggered as a result of the player's appearance on his island: denial, fear, suppression, uncertainty, emotional, and fugue. Each stage changes his behavior and offers its own set of possible conversation scenes. Most of these scenes give players opportunities to end the conversation in one of several ways, each adjusting Progue's opinion of the player along one of three distinct axes:

- The affinity axis denotes whether Progue likes or dislikes the player, and how much.

- The <u>submission axis</u> denotes whether Progue feels more dominant or submissive in his interactions with the player– whether he is the alpha male or a follower.
- The <u>romance/paternalism axis</u> denotes whether Progue feels more attracted to or protective of the player. At one extreme the player becomes a surrogate child; at the other, a love interest.

These axes evolved during the writing of the piece and settled on an arrangement that most simply provided an interesting range of potential characterizations I was interested in narrating. For instance, in an earlier incarnation, romance and paternalism were different axes; but I felt the possible characterizations arising from (for instance) positive values for both were not ones I was interested in exploring.

As mentioned above, each conversation with Progue can adjust his position along these axes up or down. For example, in one scene triggered if the player completed the first chapter wearing a bracelet with personal significance, Progue catches sight of the bracelet and asks if he can take a look at it. The player can choose to deny this request (dropping Progue's affinity), allow it (neutral), or allow it and let Progue keep the bracelet (raising Progue's romance).

As play continues, the various possible combinations of positive, neutral, or negative opinion move Progue into one of twelve archetypes that define his behavior towards the end of the story. For example, positive paternalism, positive submission, and negative affinity results in the "bitter father" archetype, where Progue views the player like a disobedient and domineering child.

Here are two versions of the opening beat in a climactic confrontation scene, depending on which archetype Progue is in:

> **Toady** (+ affinity, + submission, neutral r/p): He looks gaunt and hunched, watching you with eager, expectant eyes. 'You've done it,' he says, breathing raggedly, 'been to both their worlds, just like me, just like me. Oh, I remember now, finally remember. And now the choice is yours, that choice I never could make, the one that almost, almost destroyed me.' He suddenly steps forward earnestly, searching your face with a hungered eagerness. 'But you're not like me, friend, no, you're so much stronger, so much... You've decided, haven't you, haven't you already?'

> **Disciplinarian** (– affinity, – submission, + paternalism): He looks thin, a sickly gauntness accentuated by his rigidly straight posture as he stands in your way, looking towards you distastefully. 'Back already,' he says in a disappointed undertone. 'The fate of three worlds on her shoulders, and she's back already. You know, I've always thought of you like a daughter; even though we've never gotten along, you've at least been respectful and shown the proper

deference to my position. I've had expected you'd have spent more sums of time liberating and deliberating, but.' He coughs, never taking his eyes from you. 'But, but, but. We've learned to disappoint each other. Well. So tell. Have you already decided which it will be?'

Progue's functional role by the end of the story (hero, villain, love interest, goofy sidekick) is entirely determined by the player's interactions with him throughout. The resolution of his character arc is also dependent on player actions: depending on his archetype and the way the final scene plays out, Progue can be be murdered or exonerated, commit suicide or fight for his ideals, or one of eight other endgame scenarios.

While I felt Progue was largely a success, the extreme complexity of the character's code made difficulties with him both intensely difficult to diagnose and repair, and failures all the more mimesis-breaking for an engaged audience. In addition, the subtle text substitutions and altered behaviors provided in many cases too opaque a window into Progue's interior workings. From informal interviews and published reviews I gathered that players could often not tell which conversation responses might cause Progue to become more submissive, paternal, and so on. In many cases, the change was not noticeable at all, and did not successfully indicate to players that their actions had had an effect on the character. More mechanisms to let the player shape their relationship with Progue more directly might have created a stronger feeling of agency for players, and an increased ability to shape the story more to their liking.

III. A Meaningfully Interactive Story

I began this project with a belief that allowing players to define what a story means for them, and take actions in the story world that assert and confirm these beliefs, can potentially create powerful, moving, and personal experiences. While many interactive stories, from 1993's *Myst* to 2007's *BioShock*, offer choices to the player that promise to affect the plot, too often these choices affect only which final cutscene is played. The choice has no repercussions within the playable experience itself, only the inaccessible world narrated by the cinematics. Even worse, in many such experiences there is one clear "good" ending and several "bad" or compromised endings, and while a game's advertising may claim otherwise, most players do not feel they have reached a satisfactory conclusion to their play experience until they replay and receive the authorially blessed ending.

A second prime design goal for *Lacuna* was to create a story space where meaningful choices are given to the player early enough to have repercussions within the plot, not just at its conclusion, and where each possible ending is a dramatically satisfying and interesting end to the story arc defined by that player's choices. The player's relationship with Progue is one example, but the story also aims to give players agency on other fronts.

A. Defining the Protagonist

A player's first three commands in a traversal of *Lacuna* are character defining moments, and several other opportunities exist throughout the story for the player to paint her character more specifically. The player character (PC) has a specific history and background, but is not named, given quoted dialogue, or taken over in non-interactive cut scenes. A player progressing through the story acquires a personal history which is remembered and integrated into the narrative. In one resolution of the story's first chapter, the player character can marry and have a child before the rest of the story takes place. Later on, certain dangerous actions can result in a broken leg, which affects options available in later chapters.

One player singled this out as a reason she found the story compelling:

> "Normally, I find choose-your-own-gender scenarios to be gimmicky and unsatisfying, but I came to identify strongly with the particular character that I created in the first act of the game—female, middle aged by the time she gets around to wayfaring. . . , recently widowed. Her particular character strongly influenced the way I viewed the rest of the game. For instance, as she discovers more about Phoebe and Lethe and their father, I found myself wondering what my PC thinks in light of the fact that she herself has a child she will never see again. Furthermore, I don't feel that this sense of engagement was a fluke of my particular choices. Next time around I might choose to be a young gay man instead, though I imagine that it will be difficult to shake the image I have of the PC now."

As the player progresses through the narrative, the story keeps records of past behavior, and during the final chapters makes a guess as to which of three central figures the player feels is most important to the narrative: Progue, the player character, or a love interest named Rume. The final chapter and epilogue are completely different depending on which character is selected, attempting to retroactively assign meaning and provide dramatic closure through its staging of the story's concluding scenes. For instance, the epilogue focusing on Rume (who otherwise only appears in the story's first chapter) heavily invokes the language and imagery of that first chapter, to make the story feel as if it has come full circle; other endings, however, frame the opening chapter as a starting point at the beginning of a journey to a very different endpoint. In fact, the protagonist of *Blue Lacuna* (in Egri's sense of the character who undergoes the most significant change[1]) can be different between different traversals.

Many reactions to the game have cited the feeling of agency and meaningful choice as a factor in their enjoyment, perhaps none more succinctly than in a review by Carl Muckenhoupt: "Choices can actually be significant in this game."[4]. IF author Emily Short described her experience as follows:

> "Despite the tremendous flexibility of content in

its midgame, *Blue Lacuna* does not sacrifice its narrative arc. No matter your relationship to the other characters or the philosophical positions you may have expressed by the end of the game, certain significant choice points will occur. The resources you have to meet those choices, and the way you feel about them, will inevitably depend on how you played up to that point. The result is a structure that feels narratively cohesive and yet not excessively binding."[7]

B. Personalized Text

On a smaller scale, *Lacuna*'s text is highly parameterized based on the player's specific situation. A full day/night cycle is simulated, which affects descriptions of areas, as well as a system of tides that alter the geography of the island where much of the story takes place. While most IF players only treat descriptions of surroundings as prose when the room is first entered, and skimmed or auto-read thereafter, *Lacuna* constantly varies the description of the surroundings, to encourage the player to continue engaging with the text as prose. While this level of environmental customization has been commonly seen in graphical interactive stories with explorable environments (such as Bethesda's 2005 *Oblivion*) it's rarely been used in a textual simulation of such environments.

Here are two descriptions of the same location, "Center Beach," with different time of day, time level, beach cleanliness, former location, and navigation method.

> The sand burns hot under your feet in the afternoon light, forcing you closer to the cool damp sand near the waves, and the black cliff of the lava **flow** silently absorbs the heat. Gleaming white sand almost blinds you as it stretches in a great arc around the **lagoon**. The beach stretches away back towards the cluster of *boulders* or the rocky *rise*, or you could wade *down* into the lagoon. The cabin lies *up* the beach.

> The long shadow of the lava **flow** stretches all the way to the water, leaving the ripples of the beach and the cabin in shadowless morning. Sand strewn with jagged broken shells and decomposing seaweed curves around the **lagoon**. The beach stretches away to the *north* and *south*, or you could also head *west* down to where the waves are breaking. The cabin lies back to the *east*.

The descriptions also contain subtle details designed to help orientation and navigation. Most descriptions of exits preface the player's prior location with the word "back," as seen above, or describe details of scenery using words like left, right, forward, and behind, based on which direction the player is traveling in. Descriptions also vary based on information they've learned (such as Progue's names for various plants or animals), what details are important at the current phase of the story, and whether the player is

in story or puzzle mode (described below).

The system also remembers details about the environment during the traversal: Progue might reminisce later in the game about "that time we met on the beach at sunset." This message is unique for each player, both in the location where the scene took place and the time of day at which it occurred. While these are not effects meant to be overtly noticed by a player, the hope was that they would subtly affect the experience of engagement and agency with the story: the player chose to explore that part of the world at that particular time, and the game remembered that choice and worked it into the weft of the narrative.

Writing this amount of conditional descriptive text proved to be a huge burden on the author. The source code to describe the island of Lacuna contains an order of magnitude more text per room than seen in the source code of *Adventure* or other classic works of IF. While some players reported appreciating the attention to detail, the changing text had a negative affect on their ability to orient themselves in the environment: each time they returned to a location, they had to re-read its description, rather than being able to quickly glance at it to refresh their memory of important aspects of their surroundings. Most of the more subtle customization effects seemed to go unnoticed by players.

In retrospect, I dont feel the exponentially increased burden of hand-authored responses is worth the slight sense of increased immersion engendered in players. For future work, I am exploring ways to automate or perhaps partially procedurally generate the details of some of these messages, as I believe the goal of increased personalization of the story for the player is still worthwhile.

C. Inviting the Player In

During the design of *Lacuna*, an experimental pair of games were posted to the rec.arts.int-fiction newsgroup in a topic titled "Suprematism in IF" (Andrey Grankin, 2007). One game rejected every command the player typed, while the other pretended to understand everything (displaying messages like "You do precisely that. Interesting, what happens now?"). While the mechanics of each game were identical, I felt that the second game seemed more compelling, even though the ruse was obvious. This led to a new sub-goal in *Lacuna*'s design: to allow the player to feel like a meaningful participant even in situations where their commands were not resulting in any significant action in the model world.

For example, many works of IF with bodies of water respond to attempts to swim with refusal messages (such as "It's far too cold" or "You never were much of a swimmer"). If the player swims in Lacuna's tropical waters, however, the story narrates a relaxing swim in the lagoon. The text is essentially an elaborate rejection message: nothing happens as a result of swimming, and the model world does not simulate the concept of swimming nor is it changed in any way by the player's command. But the player has been allowed to play, and her personal memory of the story now includes a pleasant swim. Whenever

possible, unless the requested actions would be obviously suicidal or catastrophic, I let players climb, swim, dig, cry, nap, and take other unimportant but satisfying actions in *Lacuna*'s world.

The goal is for the player to feel the story is being told with them, not at them. It may make no difference to the narrative if the player goes for a swim or takes a nap, but it makes a difference to the player, who feels as if he's been allowed inside the story and not just permitted to watch it pass by from behind a safety bar.

IV. NOVICE-FRIENDLY INTERFACE

Fiction writers often are advised to make the first paragraph of their work as compelling as possible, to grab readers in their first minute with a piece and compel them to continue with the story. In IF, this first minute includes dealing with a frustrating and unintuitive parser that converts typed commands into action within a simulated story world. After watching novice players struggle with a public exhibition of an earlier IF project, *Whom the Telling Changed*, I wanted to experiment to see if I could preserve the fundamental experience of playing IF in an interface that was easier to explain and understand. I set the goal of devising a system that could be explained with a single sentence of instruction.

A. Keyword Navigation

The central concept of the emphasized keyword system devised for *Lacuna* is "type words that interest you to advance the story." While standard IF commands use both a verb and a noun, *Lacuna*'s system assumes the verb in three common cases when omitted, and highlights words in the story that will be fruitful for interaction. While similar to a hypertext interface, the system uses different styles of emphasis to indicate different modes of interaction, and is also built on top of a coherent, simulated model world, giving players more agency and direct control over the player character.

Lacuna uses three types of visually distinct emphasized keywords: nouns, locations, and conversation topics[2]. Nouns which can fruitfully be interacted with are emphasized, and typing an emphasized noun alone is the same as using the standard IF examining action on it (to get more details about that object). Nearby locations which can be explored are highlighted in a second style, and typing these moves the player character in the appropriate direction. Finally, during conversation, available beats are emphasized in a third style; typing these maps to the IF command to ask that character about that topic.

The primary advantage of this interface paradigm is that it simplifies the number of syntaxes that novice players must learn in order to begin navigating the story. In traditional IF, new players must either read instructions or discover by trial and error that EXAMINE (or X) is used to find out more about the story world, compass directions like NORTH are necessary to move, and a specific

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[2] The appearance of the emphasis changes based on player preference and choice of interpreter.

syntax like ASK PROGUE ABOUT THE SCULPTURES is required to engage in conversation. In Lacuna, all three interaction methods are collapsed into a single and consistent input method.

The emphasized keyword system is an overlay on, not a replacement for, traditional IF syntax. Standard IF input will be understood and correctly parsed. This makes the story both accessible to novices (as with hypertext) but also allows for more elaborate interactions with the story world (an in traditional IF).

Lacuna's keyword interface has been cited as one of the successful aspects of its player experience[2] and has been emulated in at least one subsequent work of IF by another author, C.E.J. Pacian's 2009 *Walker & Silhouette*. Anecdotally, I've talked to many players unfamiliar with IF who were able to engage with the story more effectively through the keyword interface system. I've released a freely available Inform 7 extension, "Keyword Interface," for other authors who wish to make use of it in future IF projects.

A.1 Compassless Navigation

One component of the system which has not been as successful is the compassless navigation. While earlier IF such as Mike Roberts' 2003 *Rat In Control* had experimented with exploring spaces without compass directions, Lacuna marks the full time a fully realized game with an explorable environment has used such a system. Opening or closing a compass object in the story switches between two navigation paradigms: typing either nearby landmarks to move (words like PATH, BEACH, or UPHILL) or traditional IF directions (NORTH, SOUTHEAST, IN). The latter approach, while an entrenched standard from the very first IF, *Adventure*, has been criticized for its non-diegetic quality[3] (often appearing in contexts where the player character has no way to differentiate between directions, or even where compass directions are meaningless, such as outer space).

While I found that many players preferred the aesthetics of compassless navigation, they had a much harder time with this system's playability. Moving via compass directions allows for the construction of a mental or physical map of spaces and the relationship between them; without this mapping ability, players could not remember how to get from one place to another in the story world, or form a coherent mental image of the landscape and the major landmarks within it.

As a failed experiment, *Lacuna*'s compassless navigation is useful in demonstrating that compass directions are not merely a vestigial remnant of the genre's cave-exploring roots, but a useful tool, in the absence of 3D graphics or visual cues, to help players position themselves in a simulated world.

B. *Smarter Parsing*

Another component of *Lacuna*'s friendliness to novices is a more concerted effort to make sense of player commands. IF's command line interface descends from early computer operating systems, where users were expected to read the manual and the system was not obligated to understand even trivial variations from the expected syntax. In an era of Facebook games and gestural interfaces, such pedanticism can seem gratuitously unfriendly. Until very recently, for instance, games produced with Inform 7 would by default understand LOOK AT {SOMETHING} but not LOOK {SOMETHING}—the latter would be rejected with "I only understood you as far as wanting to look," a message which does not indicate to players the form of the expected syntax. While UNIX offers man pages, most interactive fictions include no built-in way to learn how to correctly interact with the system.

For *Lacuna* I wrote an Inform 7 extension called "Smarter Parser," which uses regular expression matching on unparsed commands to search for alternative forms of command input. When possible, it tries to restructure these commands into valid syntax, informing the player what it did and resubmitting the command. For command forms that do not fall into categories the simulated world is concerned with, a more helpful rejection message is printed that directs the player toward more useful types of input.

Smarter Parser can successfully understand commands like I DON'T KNOW WHAT TO DO (displaying some basic help), I WANT TO GRAB THE APPLE; ANYWAY TAKE THE APPLE; or TAKE THE APPLE INSTEAD (reparsed as TAKE APPLE), GO NORTH CAREFULLY (reparsed as GO NORTH), GO TO TABLE (explaining that position within locations is not important), PUNCH HIM WITH MY FIST (reparsed as PUNCH HIM), LOOK AT CEILING (explaining that random scenery objects are rarely significant), WAIT FOR A WHILE (reparsed as WAIT), or even THIS SUCKS (suggesting saving your game and coming back later).

A series of prioritized rules is used to produce the response most likely to be useful. For example, here is the code for the rule that correctly parses a command like NOW GO NORTH:

```
A smarter parser rule (this is the stripping pointless
    words rule):
  if stripping "(anyway|instead|very|almost|this|so)" is
      fruitful or stripping "(just|now|next|around|more)"
      is fruitful:
    print explanation for stripping pointless words rule;
    if the number of words in the rejected command > 0,
        rule succeeds;
    else rule fails.
```

This attempts to remove any words in the quoted lists from the player's unsuccessful command. If any were found, a message will be displayed explaining that these words are rarely useful: if at least one word still remains in the command, the story will try to parse it again, and if not, the player may try entering a new command.

"Smarter Parser" also successfully handles other forms of interaction commonly attempted by new IF players, including parsing a question mark as a request for help, and an empty line (pressing enter with no command) as a request to re-describe the environment. Attempts to manipulate objects no longer visible will remind the player

where they were last seen, rather than displaying the standard and sometimes frustrating message "You can't see any such thing." This latter functionality is provided by a companion extension, "Remembering."; two other extensions correct basic typo errors ("Poor Man's Mistype") and improve clarification of ambiguous commands ("Numbered Disambiguation Choices"). Comparing a story compiled with all four extensions with an existing data set of misunderstood commands used by IF novices[5] indicates that they more than double the parser's success rate at understanding a new player's intention.

V. Reactions

A few disappointments aside, for the most part players and myself have judged Blue Lacuna a success. The interface improvements brought this story to a larger audience than traditionally reads IF, and many of those who traversed the entire story have told me they found it personally meaningful. One respondent from Switzerland wrote:

> "I would like to thank you for the wonderful experience you give me by 'blue lacuna'. I think it's far more than a game or a story, it is a combination of both at the best way possible. There is so much poetry and thought in it! ...Your textadventure is in exactly the way I wished more games were. It touches me, it reacts on my actions, it lets me immerse in its deep, very fine and well imagined world. That's something I haven't experienced since a long time...Hey, I am not ashamed to confess that it let me even drop some tears..."

Readers have made *Lacuna* into a story of a young gay man who must battle with a crazed lunatic to do what he knows is right; a story about an aging and bitter widower who rediscovers what it means to love and sacrifice; a story about rejecting complacency in the face of temptation; a story about love conquering all. Each of these stories have the same sets, props, characters, and dramatic beats, but they mean very different things to different people, depending on the choices each one has made as they pass through it.

I believe the author of an interactive story is like a parent passing building blocks to a child. The parent carefully selects building blocks designed to fit together and produce a solid, interesting structure, but the hope is that the child can build something with those blocks that will surprise and delight them both. For future projects, I hope to build on the tools developed for *Lacuna* to explore more ways in which authors and interactors can play together.

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