# Natural Language Generation and Narrative Variation in Interactive Fiction

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**Abstract**

Interactive fiction can be understood and improved using concepts from narratology. Particularly useful is the idea that the discourse, or expression plane, can be considered separately from the underlying story, or content plane. While this sort of correspondence suggests many ways to improve IF and to achieve narrative variation, IF systems have yet to incorporate this distinction. An architecture that is based on this distinction, and that abstracts the simulated from the narrated, is presented. A preliminary system, implemented based on this architecture, is then described. Examples of some sorts of narrative variation this system can accomplish are provided.

## The Interactive Fiction Situation

Interactive fiction (IF) was most prominent in the late 1970s and 1980s, when *Zork I-III, Planetfall, The Hitchhiker's Guide to the Galaxy, The Hobbit,* and other best-selling programs were published by Infocom, Level 9, Melbourne House, Magnetic Scrolls, and other companies. But the development of IF works (also called "text adventures" or "text games") continued after the commercial market for IF subsided. Recent IF works have been innovative in theme, in the texture of their output, and conceptually. This project's ultimate goal is to further advance the state of the art of interactive fiction, allowing authors to create more aesthetically engaging work, to present striking new perspectives to interactors via simulation and narration. To understand this project's focus on interactive fiction, it is useful to consider some of the particular qualities of IF.

### Characterizing Interactive Fiction

The term "interactive fiction" is not meant to cover all sorts of digital literary art; it has a specific meaning. In the more than 30 years since Will Crowther and Don Woods created the canonical version of *Adventure,* interactive fiction has developed as a genre. It now has well-established conventions, its own flexible, powerful development platforms, and its own community of practice. IF also has important formal qualities. A text-based work of interactive fiction, also called a game, is a computer program that accepts textual input and generates textual output. Accepting textual input distinguishes IF from "Choose Your Own Adventure" books and most sorts of digital literary works, although there are other programs, such as chatterbots, that read what the user has written. A work of IF is additionally a potential narrative — a system that can generate several different narratives depending upon what user input is provided. A work of IF simulates a world, which is the basis for what it narrates. The world model is one feature that distinguishes IF from the typical chatterbot. Within this simulated world, the interactor influences what happens by commanding a character, called the *player character.* Finally, almost all IF can be better understood if it is considered as either a game that can be played (with some outcomes being better than others) or, perhaps more usefully, as a riddle that can be solved, something which the user will have to expend effort to figure out (Montfort 2003b). Interaction in IF is not strictly task-based, but it is also not simply exploratory: the user is seeking to understand the nature of the simulated world, the place of the player character in that world, and what must be done to reach a satisfactory conclusion.

### IF as Language Generator and Dialogue System

An IF program can be conceptualized as a natural language generation system and as a dialogue system.

Modern-day IF systems such as Inform and TADS generate language simply by printing orthographic strings when certain events are simulated in the world or when objects need to be described. Although this type of narration accomplishes the basic communicative purpose, it makes many sorts of narrative variation difficult. For instance, there is no capability for re-ordering events so that they are narrated in a sequence that is different from the one in which they occurred, and it is difficult to even select the order in which objects will be listed and described.

Considering IF as a dialogue system highlights some of the important ways in which IF narration differs from that of a story-generator. An IF system will narrate particular events and describe certain objects in a reply to the user, a reply which exists in some discourse context. In producing each reply, the system must take into account its own past

replies and the user's commands, and it must update the discourse state so the interaction can continue. None of this was required in story-generation systems such as Tale-Spin (Meehan 1976) or the many systems of this sort that followed. Additionally, story-generation systems have typically made decisions exclusively about the story world itself — what existents are in the story and what events happen — rather than making decisions about how to tell these. The one intriguing exception is a system, in development, that focuses on narrative levels (Lönnecker 2005). An IF narrator, distinguished from the simulation or world model, would not be able to choose anything about what happens, only how it is related.

## Insights from Narratology

The underlying architecture and the preliminary system that has been developed are based on several ideas from narratology, a field of study that developed in the late 1960s and early 1970s and which has resulted in a substantial body of formal and general theory about stories and how they are told (Prince 2003; Bal 1997; Prince 1982; Genette 1980; Chatman 1978), some of which has even been modeled computationally (Meister 2003). While a piece of interactive fiction is a computer program, not a narrative, some of what an IF program does is usefully considered as narration, and analogies can be drawn between what is computationally modeled in a work of IF and what narratology has identified as the story level, underlying the discourse or expression.

### Story and Discourse

The basic distinction between *story* and *discourse* has long been noted in discussion of narrative. The "content plane" of story has been discussed, since Aristotle, as *mythos, fabula, histoire,* and *narrated;* it is, essentially, what is told about. The "expression plane" of discourse has been framed as *logos, sjuzet, discours,* and *narrating*; that is, the telling itself. There are certainly some differences between the classical, Russian Formalist, and contemporary narratological ideas about the story/discourse distinction, and some see more than two levels as being essential, but the idea that what is told about can be considered distinct from the telling itself is not at all a controversial one. Rather, it is a fundamental idea in narratology.

Two simple narratives suffice to show how the same underlying story can be expressed in different ways:

(1) John ate a sandwich, and then he died.
(2) John died after eating a sandwich.

While these sentences may not be of compelling literary value, the basic technique — changing the order in which events in a given temporal sequence are related — is important to the aesthetic and rhetorical effect of more complex narratives.

The story/discourse distinction, and anything like it, is surprisingly absent in the architecture and knowledge representations of computer systems that generate narrative. Neither popular interactive fiction development systems nor non-interactive research systems for generating folk tales and other narratives — except for the one proposed system of this sort — abstract the story from the discourse to allow the manipulation of one independent of the other.

### Events and Existents

Story has two fundamental elements: *events,* which are things that happen, and *existents,* which are the entities in the story (Chatman 1978). Actors, physical objects, and places are all existents, for instance, while any change in the state of these is an event. An event may be caused by some actor within the story, or it may be a *happening* with no agent, such as "there was an earthquake." This concept of story allows the content plane to be understood as the state of all that exists in the story world along with the changes in that state.

### Narrative Variation

Many types of narrative variation have been noted by those considering print narratives. A few of these will suffice to show what a narratological perspective on IF can offer:

- Variation of the order in which events are narrated.
- Variation in the speed with which events are narrated, so that the same event might be narrated with a greater or smaller amount of text. In the extreme, this includes the case of ellipsis, where no time is devoted to the narration of an event.
- Variation in frequency, the number of times events are narrated as compared to the number of times the events occur at the level of story. Regarding these three, see particularly (Genette 1980).
- Variation in explicit signs of the narrator, which corresponds more generally to the phenomenon of the attribution of utterances.
- Variation in explicit signs of the narratee, from no mention to strong implicit mentions to explicit references, such as an address to the "reader." Regarding these two, see particularly (Prince 1982).

## A Narratological Perspective on IF

A systematic way to add narrative variation is provided by the following view of IF:

- The story level, or the content plane, is seen as analogous to the world model or simulation in IF.
- The discourse level, or the expression plane, is seen as analogous to the interface in IF, which accepts commands from the interactor and provides replies.
- Existents and events at the story level correspond to actors, things, rooms, and events that are represented in software and are simulated in the world model.

This is not the only correspondence that can be drawn between narratological elements and IF elements, or even the obvious one. In narratology, "story" is properly

considered to underlie any representation, whether it is a text, a diagram, or a set of data structures in a computer program. So a mapping could reasonably consider the world model itself to be a form of expression — an intermediate sort of discourse, hidden from interactors — rather than seeing it as corresponding to the story level. Indeed, it can be useful to consider that there is a lower level beneath the world model — the world that a person infers from this model — which different world models might express differently.

This project is not concerned with the variety of possible world models that represent the same underlying content, however. The question is, rather, how a given world model can be narrated differently within interactive sessions. Given that theories of narrative have considered the question for decades with regard to story and discourse, the useful correspondences to draw for this purpose are between world model and story, interface and discourse.

Interactive fiction produces texts that describe characters and objects, even when these characters and objects are not simulated, that is, when they do not have a representation in the world model. An analysis that considers the cognitive effects of IF on the interactor, the way an interactor imagines certain existents and events during the experience of a session, could uncover a set of events and existents that were imagined. This cognitive content would not necessarily correspond to what is represented in software. The disjunction between these two sets is very interesting to consider and can probably tell us a great deal about the relationship between simulation and narration. But when attempting to automatically produce narrative variation, it makes sense to consider only those existents and entities that are explicitly represented in software, since they are the ones that can be directly worked upon by the narrating module of the program. So, *existents* and *events* does not refer, in this paper, to anything that might be conjured up by text but which lacks an internal representation.

### Command and Reply in an IF Session

As has been described in greater detail elsewhere (Montfort 2003a), there are formally distinct elements of interactive fiction. A *session* is a particular encounter with an IF work, beginning when an IF program is started and concluding when it is terminated. There are different sorts of things that an interactor can type, and different things a program can output to the interactor, not all of which pertain to the simulated world that is analogous to the content plane. For instance, "pick up the phone booth" is a *command* intended to cause the player character to perform some action in the simulated world. The program might provide a *reply,* "You see nothing but dust under there." This, too, would pertain to the simulated world. But the interactor might also type "quit" and receive the output "Are you sure you want to quit?," which pertains to the execution of the program itself, above this level. This type of exchange, which has been termed a *directive* followed by a *report*, is part of ordinary interaction, but a reasonable starting point for work on narrative variation would focus not on such exchanges but on commands and replies, which relate directly to the simulated world and which make up the bulk of most IF interactions. The third type of exchange, an *unrecognized input* followed by a *clarification*, is also important to the interaction, but it does not involve narration of story-world events or existents. After understanding how narrative variation can be achieved in replies, it will be appropriate to look further into how replies fit into the overall texture of interaction.

### Hard and Easy Narrative Variation in IF

In addition to the five types of variation mentioned previously, there are many other ways a generator might vary the narrative it creates. Some of these would be considerably more difficult to implement and would require much more extensive underlying machinery. For instance, the system might change from narrating the story externally (while focalizing on the player character) to narrating the story from a point of view that is bound to the character, incorporating that character's thoughts, mannerisms, biases, and so on as it narrates. This sort of variation has been used to accomplish many powerful literary effects, but it would require a much more extensive model of the player character's consciousness, of common sense reasoning abilities, and of the construction of narrative language — unless it is to be programmed in very *ad hoc* ways. Variation in speed, order, frequency, signs of the narrator, and signs of the narratee above are more likely to be realized within a system of approximately the complexity of existing IF systems. Such "easy" variation is more quickly attainable, and can be quickly adopted by existing IF authors and others creating text-generation systems. Easy variations still provide important insights into the benefits of bringing this story/discourse distinction into an IF system's architecture, and can be the basis for more elaborate work on narrative variation.

## A New IF Architecture

An interactive fiction development system should provide separate models for simulation and narration if authors are to be able to achieve narrative variation. The architecture presented here abstracts the representation of the world from the representation of the discourse and the function of simulation from the function of narration.

### Minor Components

**Joker.** Carries out program-level functions — save, restore, restart, undo, etc. Handles directives (non-diegetic inputs) and produces replies (non-diegetic outputs).

**Preparer.** A simple tokenizer.

**Clarifier.** Currently just produces an "I don't understand..." reply for anything not parsed; could be extended to help clarify ambiguous or unclear inputs.

**Presenter.** Does the final processing of text for display,

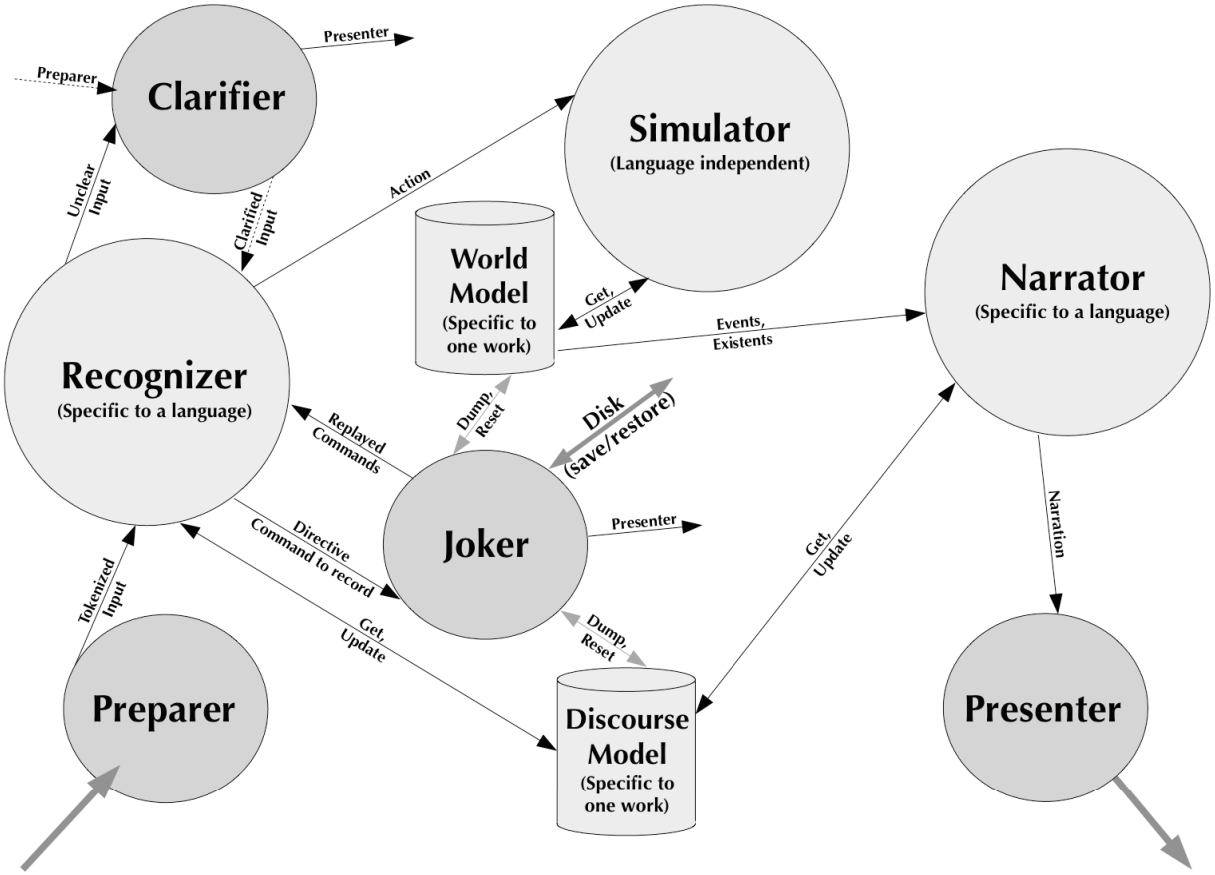


**Figure 1.** An architecture for an IF development system that models the world (that is, the simulation, corresponding to the story level) separately from the discourse, the way that events and existents are narrated.

which for now simply involves formatting it for a terminal window of a particular width.

### Recognizer

A simple parser that uses an easily extended semantic grammar. Work on narrative variation will probably not require substantial improvements in the recognizer, although pronoun resolution should be added.

### Simulator

Manages the entire simulation, including the states of existents (a door is open or closed), the configuration of existents in the world (the player character is in the kitchen), and events that may change these.

The simulator described here is intended mainly to model the physical world. There are various techniques that can be used in the existing system to model the interior mental states of characters in lightweight ways, but this representation is not the purpose of the current simulator. This project's focus is on the way that narrators can act based on representations of events and existents within a simulated world, not on the similar question about how characters might act. Characters simply act in whatever ways game authors have programmed them to act; no matter what they do, the narrator module must be able to narrate their actions, and everything else that transpires in the simulated world, appropriately.

The simulator models existents with a tree of objects and uses a small, closed set of primitive events. Inasmuch as the simulator's events are language-independent and primitive, they relate to the primitive actions of conceptual dependency (Schank 1975). While the concept of primitive event is useful, the simulator does not borrow much else from conceptual dependency theory. The set of events is fixed, and the simulator emphasizes on the physical world to the exclusion of mental states. Events are not related by conceptual dependencies, but by causal entailments; preconditions are checked before events can occur. The idea of this representation is not to encode natural-language knowledge but to run an underlying simulation of a story world at an appropriate level of detail.

**Existents.** These are of three types: things, actors, and

rooms. The world is modeled as a tree with COSMOS, an actor, at the root. The children of COSMOS are the rooms, representing distinct physical spaces. The children of the rooms may be things or actors, and these may have their own children, and so on. The basic idea of an "object tree" of this sort is fairly standard in IF, and is seen in the widely-used system Inform (Nelson 2001), which employs one of the capabilities of the 1979 Z-Machine to represent objects in this way.

Actors are the only existents that can initiate events. Hence the status of COSMOS as an actor: happenings, such as "it started to rain," are represented as being initiated by COSMOS. The player character is also an actor.

All existents except COSMOS have a single existent as a parent. An existent has some unique relation to its parent, such as ON, IN, OF, or PART. A fixture in a room will be in the PART relation with the room; an object possessed by the player character will be in the OF relation; the player character standing in a room will be IN that room. A child can change its relation to a parent while still remaining a child of that parent: For instance, the player character taking off a coat moves the coat from the ON relation to the OF relation, but the coat remains a child of the player character. There are standard relations provided, but the set of relations is open, so an author might add one such as ORBITING or IMPLANTED for use in a specific game.

Existents can have state, so a lamp might have a Boolean-valued LIT state with true corresponding to on and false to off. Some standard states are provided, as with relations, but the set of these is also open.

Non-hierarchical and multiple-parent relationships are not directly represented. For instance, if one wanted the moon to be the child of every outdoor room and to be visible in all of them, this would not be possible. Siblings can be easily found by ascending to the parent and requesting the list of the parent's children. All objects in physical proximity can be determined by ascending to the room and requesting all the descendants of the room. Non-hierarchical relationships between objects ("the twins are holding hands," "the two pieces of metal are welded together") have no clear representation in this system in terms of relations, and it may prove useful to account for such relationships in the model. However, there are workarounds for this sort of problem in the current system. A game could consider the twins and the pieces of metal each as a single object, if there is no simulative or narrative reason to represent them separately; alternatively, if they should be separate, both individual objects could have states to indicate they are holding hands or welded.

**Events.** There are five basic events, one special event, and two special non-events that are represented in the system. Only two of the five basic events change the state of the world.

A command from the interactor causes the player character to undertake only a single event, but this, like all events, may entail other events.

The event types are as follows:

- MODIFY changes the state of an existent. A light is switched on or off by this type of event.
- CONFIGURE changes the world tree in some way, either by modifying a relation or by moving an existent to have a different parent and to be in some relation with that parent. All sorts of physical movement of existents are represented by these types of events.
- ACT represents some action that (as far as the simulation is concerned) has no effect on the world, by itself. Speaking a word when alone in a forest or waving something around without effect are examples of this type of event.
- IMPEL represents application of some amount of force to an existent, in a particular direction. Pushing a desk is one example. Touching an object is a degenerate case of IMPEL where the amount of force is 0. By itself, this event does not change the world state, but it may do so by entailing another event.
- SENSE represents sensory attention; reports to the player character about what can be perceived are provided because a SENSE event occurred.

A special case is the event type BUNGLE, which represents a failed attempt to do something. The failure to do something is important both because the attempt may have implications in the simulation (it may entail some other events) and because it needs to be mentioned by the narrator.

There are also non-events which nevertheless are useful to represent and register alongside the events above. One of these, somewhat similar to BUNGLE, is REFUSE. This non-event represents the player character's refusal to do something. For instance, if there is a solid wall to the east that can clearly be seen, a command from the player character to "walk east" would usually be met by refusal by the player character. The refusal needs to be mentioned, but it differs from a BUNGLE because it cannot cause anything to happen in the world — it is the same as if the player character had simply done nothing.

The final non-event is CONCLUDE, which indicates that some conclusion has been reached and that neither the simulation nor the narration should proceed beyond this point in time.

When a player gives the command "go west" and there is a visible, open door to the west, an IMPEL event is initially generated. Since there is no obstacle to proceeding though the door, the player character is the agent and object of a CONFIGURE event entailed by this IMPEL, which moves the player character to the next room. Upon entering the room, the player character automatically looks around, represented as this CONFIGURE event entailing a SENSE event. Each of these events is passed to the narrator with information about its duration, the particular time at which it occurred, and what caused it — either the command (in the case of IMPEL) or some other event (in the other two cases).

## Narrator

Without making any changes in the simulated world, the

narrator produces discourse-level output for the interactor to read. The narrator uses a standard three-level pipelined architecture for text generation (Reiter & Dale 2000).

**Reply Planner.** Content selection and ordering is done here, according to the current narrative specification and based on events and existents.

**Microplanner.** This level will incorporate referring expression generation and along with aggregation, determining when phrases will be combined into a single sentence.

**Surface Realizer.** Detailed sentence plans are realized as language at this stage, converted into orthographic strings for output. Potentially, generation could be done in languages other than English at this stage.

## Preliminary Examples of Narrative Variation

A prototype system has been implemented to demonstrate several simple types of narrative variation on two IF works: *Cloak of Darkness,* a small, simple game that was developed to serve as a point of comparison between IF development systems; and *Adventure,* the first interactive fiction. Both have been used as "benchmarks" in IF (Douglass et al. 2005) and are understood apart from their implementations on specific platforms.

### Changing Person, Tense, and Aspect

Changing the person, tense and aspect of the narrator's statements has an interesting effect on the reception of the text, but these variations also enable other sorts of narrative variations, such as re-orderings of events. If a narrator can speak only in the present tense, it is not possible to "flash back" and narrate an earlier event in the past tense in the course of a present-tense narration.

*PERSONAL ADVENTURE*
*based on the classic by Will Crowther and Don Woods*
*I have been standing at the end of a road before a small brick building. Around me has been a forest. A small stream has been flowing out of the building and down a gully.*
*>go east*
*I have been looking at the building's interior.*
*I have been inside a building, a well house for a large spring.*
*I have been seeing food, a closed bottle, some keys, an unlit shiny brass lamp.*
*>progressive off*
*... Aspect set. ...*
*>look*
*I have looked at the building's interior.*
*I have been inside a building, a well house for a large spring.*
*I have seen food, the closed bottle, some keys, the unlit shiny brass lamp.*
*>perfect off*
*... Aspect set. ...*
*>look*
*I look at the building's interior.*
*I am inside a building, a well house for a large spring.*
*I see food, the closed bottle, some keys, the unlit shiny brass lamp.*
*>future*
*... Tense set. ...*
*>look*
*I will look at the building's interior.*
*I will be inside a building, a well house for a large spring.*
*I will see food, the closed bottle, some keys, the unlit shiny brass lamp.*
*>person*
*... Person set. ...*
*>look*
*The adventurer will look at the building's interior.*
*She will be inside a building, a well house for a large spring.*
*The adventurer will see food, the closed bottle, some keys, the unlit shiny brass lamp.*
*>get the keys*
*The adventurer will take some keys.*

### Narrating Events in Reverse Order

Specifically, a narrator can use this grammatical flexibility to perform retrograde narration — to represent events in reverse order. Here, an "explicit" narrator, one who mentions every event that transpires, is used, and the order of narration, initially the same as the order in which events transpire, is reversed before the last command is given.

*EXPLICIT CLOAK OF DARKNESS*
*A basic IF demonstration*
*A spacious hall, splendidly decorated in red and gold, with glittering chandeliers overhead. The entrance from the street is to the north, and there are doorways south and west.*
*You see a tasty muffin.*
*>get muffin*
*You take the tasty muffin.*
*>eat muffin*
*You alter the tasty muffin.*
*You cause the tasty muffin to leave this world.*
*>go west*
*You start off.*
*You move yourself to the cloakroom.*
*You look at the cloakroom.*
*The walls of this small room were clearly once lined with hooks, though now*
*only one remains. The exit is a door to the east.*
*You see a small brass hook.*
*>order reverse*
*... Order set. ...*
*>go east*
*You look at the foyer of the opera house.*

*A spacious hall, splendidly decorated in red and gold, with glittering chandeliers overhead. The entrance from the street is to the north, and there are doorways south and west.*
*You moved yourself to the foyer of the opera house.*
*You started off.*

### Inserting Explicit Signs of the Narratee

The current text generation system allows explicit signs of the narratee to be added as surface realization is done. While the effect can be amusing, it is probably more appropriate to determine how to add such signs at an earlier stage, with attention to the discourse structure and the content of utterances that will be framed by reference to the narratee.

*VICTORIAN ADVENTURE*
*based on the classic by Will Crowther and Don Woods*
*The adventurer stood at the end of a road before a small brick building. Around her was a forest. A small stream flowed out of the building and down a gully.*
*>e*
*The adventurer looked at the building's interior.*
*She was inside a building, a well house for a large spring.*
*The reader will no doubt be pleased to learn that the adventurer saw food, a closed bottle, some keys, an unlit shiny brass lamp.*
*>get lamp*
*The reader may well imagine that the adventurer took the shiny brass lamp.*
*>get keys*
*The adventurer took some keys.*
*>go west*
*The adventurer looked at the end of the road.*
*Reader, the adventurer stood at the end of a road before a small brick building. Around her was a forest. A small stream flowed out of the building and down a gully, reader.*

### Achrony

It is possible to narrate events with no regard for their chronology, a style of narration that seems evident in Alain Robbe-Grille's novel *Jealousy,* for instance. In IF, there are only the events that have already been simulated to draw from, but there is no reason the narrator needs to be restricted to mentioning ones that have occurred since the last command was issued. This also suggests a relaxation of the usual restriction on frequency: that events in interactive fiction can be narrated no more than once in a session. This is conventional, but narrative variations are possible that do not obey this convention.

The (confusing) result here demonstrates that a narrator who uses achrony is possible in IF. The ability to narrate without regard for chronology and to narrate the same event multiple times may be used in other, perhaps less perplexing ways, and may suggest new directions.

*JEALOUSY CLOAK OF DARKNESS*
*A basic IF demonstration*
*A spacious hall, splendidly decorated in red and gold, with glittering chandeliers overhead. The entrance from the street is to the north, and there are doorways south and west.*
*Franck sees a tasty muffin.*
*>eat muffin*
*Franck causes the tasty muffin to leave this world.*
*>go south*
*Franck alters the tasty muffin.*
*He is unable to see.*
*>look*
*Franck alters the tasty muffin.*
*He is unable to see.*
*Franck starts off.*
*>north*
*Franck looks at the foyer of the opera house.*
*A spacious hall, splendidly decorated in red and gold, with glittering chandeliers overhead. The entrance from the street is to the north, and there are doorways south and west.*
*>west*
*He is unable to see.*
*He is unable to see.*
*Franck looks at the cloakroom.*
*The walls of this small room were clearly once lined with hooks, though now only one remains. The exit is a door to the east.*
*Franck sees a small brass hook.*
*Franck looks at the cloakroom.*
*The walls of this small room were clearly once lined with hooks, though now only one remains. The exit is a door to the east.*
*Franck sees the small brass hook.*

## Conclusion and Plans for Future Work

The types of narrative variation that have been implemented so far demonstrate that text-generation can be used in interactive fiction to novel and interesting effect, and that the perspective of narratology has something to offer to interactive fiction and, more generally, to any narrating dialogue system that bases what it tells on an underlying world model.

From an aesthetic standpoint, it will be necessary to show how original IF works can be developed to take advantage of these capabilities. Whether increased clarity or new and powerful sorts of strangeness are desired, the effects of narrative variation will be more clear when work is developed that is native to the new system outlined here. The point of this system, after all, is to enable a wide variety of innovations, not simply to provide variations of *Adventure* and *Cloak of Darkness*.

Further development of the system should be undertaken so that all possibilities for variation in order, speed, frequency, explicit signs of the narrator, and explicit signs of the narratee are systematically explored. Other forms of

easy narrative variation, which can be accomplished with the basic representation of the story world that has already been implemented, should also be mapped out and implemented. The most interesting compositions of primitive variations in order, speed, frequency, and explicit signs of the narrator and narratee should also be identified. These sorts of specifications for narrating should then be used, along with the representation of events and existents, to improve on standard natural language generation by better guiding the generation process.

The aesthetic quality of text generation within a session is difficult to evaluate using standard computational linguistic techniques, but many of this system's intermediate goals can be evaluated in conventional ways. Generated text should be fluent; the quality of generated text can be compared to that in existing IF, which prints predetermined orthographic strings. The ability of IF authors to use the system, to actually program their own works in it, can also be evaluated. Finally, the types of narrative variation that are achieved can be compared to the whole range of narrative variation identified by narratologists in novels and other written narratives.

While there is much left to do, this preliminary implementation of an IF development system with a story/discourse distinction is an important step, one which at least illustrates some of the benefits of text generation in providing potentially changing, flexible ways of narrating the same events and describing the same existents. Hopefully, it will be the beginning of an important revolution in a form that has had a rich and varied history, and will contribute to interactive fiction's abundant future.

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