Scripting Languages for Interactive Fiction

Mike Gran
Los Angeles, California, USA

http://lonelycactus.com
gopher://spikycactus.dnsalias.com
https://github.com/spk121
spk121 at yahoo.com
Twitter @MikeSpike3
About me
Interactive fiction and its sub-genres
Hypertext Interactive Fiction as an entry point
Helping underrepresented voices
Introducing Twine and Harlowe
That time I wrote an interactive fiction in Guile
Opinion: Your introductory language is too complicated
Conclusion: Minimalism is empowering
Who am I?

I neglectfully maintain
- guile ncurses
- guile curl
- guile ispell
- libzmodem: a ZModem library for BBSs

I am actively working
- guile-gi: yet another GObject Introspection library

I can help you with
- USA Gov’t standards for software and hardware procurement
- real-time, embedded C/C++ for low size, weight and power systems
- GPS
Various Semi-Legal Notices

The following presentation was created without recourse to equipment, premises, and resources of my employer. It was created wholly during unpaid time. It does not derive from the intellectual property of my employer.

Nothing in this presentation is a “joint work” or “made for hire” under California law.

No opinions expressed or implied therein should be considered to be the opinions of my employer, the United States government, or any of its departments.

This presentation is presented under a CC BY 4.0 license.
What is Interactive Fiction?

Interactive fiction is a type of game

• Text-only or text-dominant
• Focuses on story and puzzles
• Not real time
• Describes a situation then expects the user to make a choice or decision
Three sub-genres of interactive fiction

**Classic Interactive Fiction**
- Uses text parser for input
- Usually focuses on object or logic puzzles

**Hypertext Interactive Fiction**
- Uses hyperlinks as input
- More narrative in style

**Visual novels**
- More graphical
- Typically presents pictures of characters with associated dialog
- Usually focuses on dialog and character relationships
- Uses hyperlinks or mouse interaction as input
WEST OF HOUSE
This is an open field west of a white house, with a boarded front door.
There is a small mailbox here.
A rubber mat saying ‘Welcome to Zork!’ lies by the door.
> open door
The door cannot be opened.
> look under mat
There is nothing interesting there.
You reach out and run your hand down her back a couple times. She carefully lowers her paw and sets it down on the couch. Cassie turns her head back to watch what you're doing. She doesn't look interested, exactly, but it's not like she's suddenly remembered pressing business elsewhere, either.

Behold her majesty.
Rub her back some more.
Skritch behind her ears.
Stroke those soft soft cheeks.
Yes. Go for the belly.
I heard Watanabe-san was going to make his own visual novel so that we would have some free images to use on Wikipedia! That's the kind of guy who keeps the Internet alive, don't you think?
Underrepresented Voices

The hypertext interactive fiction scene has a wide variety of authors and topics

Let’s look at four unusual games from underrepresented voices:

- Beneath Floes – addresses Nunavut culture
- Depression Quest – addresses depression
- Thread (Lucid Thread Games) – addresses veterans and PTSD
- As Cold as the Grave – queer romance
“Three times. As the heir to the throne, you have to visit the ruler of the Fae three times. Unfortunately for you, you have to meet with the Queen of the Unseelie Fae. No one has had to deal with her before.”

https://drazillion.itch.io/as-cold-as-the-grave
“Qikiqtaaluk, 1962. The sun falls below the horizon and won't return for months. You wander the broken shoreline, wary of your mother's stories about the qalupalik. Fish woman, stealer of wayward children: she dwells beneath the ice.”
Depression Quest

“Depression Quest is an interactive fiction game where you play as someone living with depression. This game aims to show other sufferers of depression that they are not alone in their feelings, and to illustrate to people who may not understand the illness the depths of what it can do to people.”
Thread

“Thread is an interactive experience that puts you in the shoes of a person coping with PTSD.”

https://www.lucidthreadgames.com/
Importance of Hypertext Interactive Fiction for Underrepresented Voices

There are some easy to find academic studies on LGBTQ Twine games.

Of the 2000+ Twine games on itch.io, 100+ are tagged by their authors as LGBT+

Games commentators such as Feminist Frequency have highlighted the importance of Twine.
Digression: NaNoWriMo

National Novel Writing Month (NaNoWriMo) is an annual writing event. Thousands of amateur authors pledge to write 50,000 word novels during the month of November. NaNoWriMo hosts group gatherings. Authors meet and write together.

TOP NANOWRIMO NOVEL TOPICS

1. Magick
2. Romance
3. Lesbians
4. Vampires

Most of these novels awful.

Who cares! You do you!

My “best” novel was about a college student who finds out he’s a robot, and then goes on a road trip of discovery. It was garbage.

When anyone can participate, you see different topics!
Who Makes Tiny, Personal Games

So you want to make a game?
It will never make any money.
Likely, only a couple of friends will play it.
Do it anyway.

The Enthalpy of Games

I have the time and energy do hundreds of hours of free labor
I have the skill
I have the vision
I have the dedication

\[ H = \text{time} + \text{skill} + \text{vision} + \text{dedication} \]

Games that exist have \( H > H_{\text{min}} \)
Who Makes Tiny, Personal Games?

People with a story to tell

People with coding skills

Lost voices

Indie games

People with time and energy
Interactive Fiction’s Domain Specific Languages

There are many domain-specific languages created to write interactive fiction.
The three sub-genres of interactive fiction have evolved separate creation tools:

**Classic Interactive Fiction**
- Inform, ADRIFT, TADS

**Hypertext Interactive Fiction**
- Twine ft Harlowe, Twine ft Ice Cube

**Visual Novels**
- RenPy
I believe Twine + Harlowe is the simplest free tool to write hypertext interactive fiction.

Harlowe is a templating language that converts Harlowe Script to HTML+JavaScript Bundles.

Like HTML+PHP:
- content is interrupted by delimited code
- each top-level page is an “experience”
- each top-level page is a closure and a scope

Simple Harlowe is simple for any skill level, but, complicated Harlowe is still complicated.
Demos!

Demo’s never work live.

But, hey, let’s try!
A man is here. He is buried in the sand. Only his head is visible.

[[Continue on]]

[[Kick the head]]

Most Twine games use just this simple syntax
Styles

*emphasis*

**strong**

//italic//

Still simple.

<img src="http://example.org/image.png">

(text-colour:fuchsia)[Fuchsia text]

Uh oh.
(set: $size to "giant")

Your stomach makes {
(if: $size is 'giant')[
  an intimidating rumble!
](else:)[
  a faint gurgle
]}.  

Our beautiful readability is already breaking down.

The sigils ‘$’ and ‘_’ on variables indicate local and global scope respectively
Control structures

(for: each _item, ...$arr) [You have the _item.]

prints "You have the " and the item, for each item in $arr.

(for: _ingredient where it contains "petal", ...$reagents) [Cook the _ingredient?]

prints "Cook the " and the string, for each string in $reagents which contains "petal".

Now we are in lambda territory.
Aside: The advantages and risks of Templating Languages

Rewards
- Focus on the task
- Avoid boilerplate
- Simplify
- Split up MVC or MVVM concerns

Risks
- Because it is readable, you think you understand it
- Leaky abstractions
- Debugging experience may suffer
- Often, makes simple simpler, but, make complex things even more complicated
That time I wrote an interactive fiction in Guile

Wanted to participate in Lisp Game Jam

Inspired by Twine & RenPy

Tried to make simple script

Eventually, newb-friendly readability of scheme is limited

(((Scheme (is) (scheme))))

Other readers remix Scheme

WISP is a Python-like syntax for Scheme

Guile-Reader adds some flexibility to the reader
(define (Seventeen)
    (You-speak-text
        "Perhaps you " '(i "should") " say something about the hotel. It is..."
    "\n⇒ "
    `(a (@ (action ,EighteenA)) "elaborately furnished")
    "\n⇒ "
    `(a (@ (action ,EighteenB)) "exceedingly expensive")))

So reasonable readable for a Scheme hacker, but, quasiquote and SXML notation is not so friendly.
Publishing and Sharing my Guile Game

Getting my Guile/GTK3-based game as downloadable binaries for GNU/Linux and Windows was a brutal process

- Statically linked everything
- Installed Guile with relative, not absolute, paths
- GTK3 on Windows is poorly supported
- Guile on Windows (via MinGW) is 32-bit, single-threaded only
# Minimalism for Newbs != Minimalism for Geeks

<table>
<thead>
<tr>
<th>Minimalism for Newbs</th>
<th>Minimalism for Geeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to learn</td>
<td>Easy to define</td>
</tr>
<tr>
<td>Easy to understand</td>
<td>Easy to explain</td>
</tr>
<tr>
<td>Easy to fix</td>
<td>Easy to parse</td>
</tr>
<tr>
<td>Easy to share</td>
<td>Easy to run</td>
</tr>
</tbody>
</table>

I’m stereotyping and making overly broad statements. Don’t @ me, bro.
I started on BASIC on the TRS-80

10 PRINT “POOPY ”
20 GOTO 10

... and hijinks ensue

You may recoil at old BASIC, but, it was the start of my journey

How should kids in 2019 start on their journey?
Hey, wanna see my program?
Kids these days expect all games to be browser, app or Steam.

So (for free software) you have to target the browser.

There are several websites that will let you publish your Twine game.

Sharing your game with friends is fairly simple.

itch.io

philome.la

newgrouds.com
A Generic Publishing and Sharing Strategy

I wish other small languages had a simple way to share.

Possible paths for a sharing site for other console languages...

Path 1
Compile to web assembly

Path 2
Use JS term emulator
Communicate websockets to language instance port
Use CloudABI or containers to make safe interpreter instance
Conclusion: Minimalism is Empowering

Tools like Twine+Harlowe (and to a lesser extent, RenPy) have low barrier to entry

- The syntax is expressive for the problem set
- The development environment supports the syntax
- Sharing or rehosting a completed work is simple
- Online services exist to host and run completed works

When that barrier to entry is low enough, the created works can represent a broader range of voices

- In Twine’s simplest forms, any storyteller can approach it.
Luke 24:10-12

It was Mary Magdalene and Joanna, and Mary the mother of James, and other women that were with them, which told these things unto the apostles. And their words seemed to them as idle tales, and they believed them not.