# IF notes
### based on *The Craft of Adventure, 2nd ed.*, Graham Nelson and *Twisty Little Passages*, Nick Montfort

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# Prehistory

- Stephen Bishop
- Explorer, Mammoth Cave, 1820-1857

# History, 1972-1981

- Will Crowther
- Explorer, Mammoth Cave
- *Dungeons and Dragons* player
- About 1972, wrote ADVENT for his children

**At End of Road**
You are standing at the end of a road before a small brick building.
Around you is a forest. A small stream flows out of the building
and down a gulley.

# Crowther was a caver

You are in a splendid chamber thirty feet high. The walls are frozen rivers of orange stone. An awkward canyon and a good passage exit from east and west sides of the chamber.

# Parser Prehistory

- Hunt the Wumpus
- SHRDLU

# History, 1972-1981

- About 1975, Don Woods gets ahold of Crowther's ADVENT
- Adds puzzles, pirates, vending machines *etc.*
- ADVENT circulates on the ARPANET
- *The Soul of a New Machine*, Tracy Kidder: ADVENT epitomizes the geek culture
- Scott Adams, many titles, simple games
- John Laird's 'Haunt'
- MUDs

# Scott Adams



Adventureland
1978

I'm in a dismal swamp.

Obvious exits: North, South, East, West, Up.

I can also see: cypress tree — evil smelling mud — swamp gas — floating patch of oily slime — chiggers

Game assemblers

```
JUMPHOLE:
 SKIP UNLESS R(CHAIR)R EQ HOLEROOM
 SKIP UNLESS H CHAIR PLAYER
 PRINTRET HOLEHIGH
 MOVE PLAYER WITH TO UPROOM
 PRINTRET CHAIRJUMP
```

# 1982-1986

- MIT students built Zork
- 1979, Started Infocom
- Huge commercial success by 1985
- Ran on over 20 different personal computer types
- Business software never successful
- Dozens of successful titles

# Infocom



- ▶ Enchanter, Sorcerer, Spellbreaker
- ▶ Deadline
- ▶ Suspended
- ▶ Infidel
- ▶ Planetfall
- ▶ Wishbringer
- ▶ Leather Goddesses of Phobos
- ▶ Trinity

# Sierra Online

# 1982-1986

The Golden Age

- *Amazon*, Michael Crichton
- *The Hitchhiker's Guide to the Galaxy*, Douglas Adams
- *Mindwheel*, Robert Pinsky (US Poet Laureate)
- *I Have No Mouth and I Must Scream*, Harlan Ellison
- *Gateway*, Frederik Pohl

# 1985-1991

- ▶ Computer graphics improve
- ▶ Market dries up
- ▶ Infocom collapses, bought by Activision
- ▶ Community grows `ftp.gmd.de`

# 1992-1999

- TADS and Inform
- Activision releases **Lost Treasures of Infocom**
- Newsgroups and the web
- Annual contests:
  - GAGS (AGT) contest
  - XYZZY awards
  - SpeedIF (write a game in two hours)

# Size

Large Games:

- 50-60 rooms
- 200-300 objects, 50-100 portable
- 20,000-50,000 words

# Reality

- Make the game world as real as possible
- IF should not be like a book of puzzles
- IF should be fiction
- ADVENT is better than Zork because its world is more authentic (Crowther *vs.* Woods)

# Main Characters

- Triangle of Identities
  - Player
  - Protagonist
  - Narrator
- The parser a fourth?

## Zork

```
> open the mailbox
Opening the mailbox reveals:
  A leaflet.

>ear the leaflet
I don't know the word "ear".

>eat the leaflet
Taken.
I don't think that the leaflet
   would agree with you.
```

# Diegesis

- Diegetic:
  - Drink the potion.
  - Go north.
- Extradiegetic:
  - Save the game.
  - Restart.
- Hypodiegetic:
  - Story within a story.
- Metalepsis: Confusing levels.
- Example: Music in movies.

# Structure

- The three act play (Hollywood movies)
  - Act One: introductions and problems
  - Act Two: struggle and almost win
  - Act Three: final struggle
- IF:
  - Prologue
  - Middle Game
  - End Game

# Prologue

- Establish atmosphere
- Foreshadow what is to come
- A little background information
- Keep the player entertained

For example: easy puzzles

# Prologue to Middle Game

- ► Transition from mundane to fantastic
- ► Rewards player for playing this far
- ► Promises a much richer world ahead
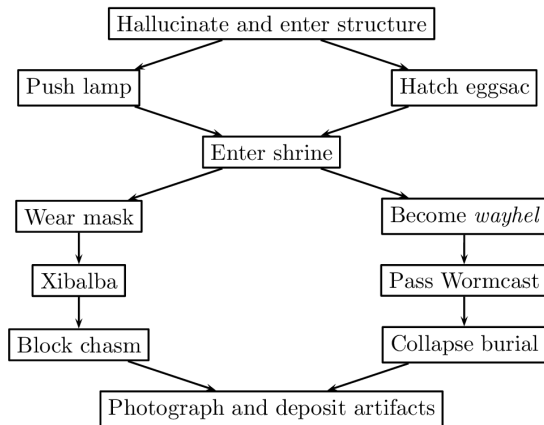
Example: ADVENT goes underground

# Middle Game

- Most structure
- Biggest map
- Regions or phases
  - Parts of the map locked up until later
  - Skills the player must acquire in order to succeed
  - Items the user must attain in order to succeed

# End Game

- Give player a sense of being near success
- Culminate the plot
- Reveal the game's secrets
- Make the end match the beginning

# Graphs

# Graphs

- Is the game soluble at all?
- How many ways?
- How much of the game happens in different areas?
- Is the game wide or narrow?
- Are there bottlenecks? They should not be too hard.

# The Soul Of Drama

- A character **wants** something
- An **obstacle** gets in the way
- The character takes **action**

If your story is lacking drama, one of these is weak.

# Bad Puzzles

- Too easy (single command solution)
- Pointlessly hard (traverse the entire map to bring something back)
- The "Get-X-use-X" syndrome. Solutions:
  - use red herrings
  - collection puzzles
  - multiple solutions
  - multiple usages
- "Guess the verb"

# Fairness

*Is the writer pulling a rabbit out of a hat or do you see the fuzzy ears first?*

*—Dave Lebling*

# Fairness

*Is the writer pulling a rabbit out of a hat or do you see the fuzzy ears first?*

*—Dave Lebling*

*One must not put a loaded rifle on the stage if no one is thinking of firing it.*

*—Anton Chekhov*

# Puzzles

Good approaches:

- ▶ Write the transcript first. Include the false tries.
- ▶ Chain backward from a goal. Ask yourself, "How can I obstruct that?" Repeat.

# Puzzle Chains

You need to pay a debt to a Senator, so you need to steal a bust from a temple, but that means impersonating a priest, by sacrificing a chicken with a gladius, which means catching a chicken (you scare it with a cat, but the cat must be attracted by a mouse, which you need to catch with a mousetrap): and the gladius isn't just lying around, either. You'll need a torch, which ...

# Mazes

- Players do *not* like mazes.
- But you can be creative:
  - A new kind of map
  - A new way of seeing
  - A new kind of guide
  - New kinds of signposts

# Light source puzzles

- Also disliked by players.
- Finding oil, batteries, *etc.* gets tedious
- Dark areas that are *not* meant to be lit can be creative.

# Capacity puzzles

- Again, unpopular.
- Limited carryall: Guess which three of these fifteen items you'll need next?
- The player gets hungry, or thirsty, over and over, and must return to the *same frickin' room* over and over.

# Timed puzzles

- Once more, unpopular
- Lead to *save-try-restore* loops
- Destroy the illusion of reality
- Events keyed to "time of day" can be effective. (Everybody knows vampires only come out at night.)

# Utility objects

- Items that can be used again and again are popular
- Crowbars, gloves, *etc.*

# Locked doors

Guarded, stuck, rusted, bolted, too heavy, ...

- ▶ Good for pacing the game, blocking off sections of the map for a while
- ▶ Usually signals a new puzzle (find the key)
- ▶ Are there people inside? Can you knock?
- ▶ Lockable on both sides?
- ▶ Does *locking* a door solve a puzzle?
- ▶ Watch out for the Get-X-Use-X syndrome

# Machinery and vehicles

- Easiest puzzles to design
- They can have switches, handles, levers, knobs, wheels, ...
- They don't have to say anything, but they could (signs and labels)
- They may require specialized tools or manuals
- They can function as doors (chutes, dumbwaiters, conveyer belts)
- Allow the user to learn by experimentation what the machine does (don't call it a "freezing machine" or a "wind machine")

# Some very useful puzzle items

Because they have so many uses.

- ▶ Fire
- ▶ Water
- ▶ Shovel
- ▶ Plants
- ▶ Animals
- ▶ Monsters

# People Puzzles

Very difficult to program effectively

Example from 'Suspect':

```
>show corpse to michael
Michael doesn't appear interested.
```

The body is that of Michael's wife.

May need to model human attitudes. See *Facade* at
http://www.interactivestory.net/

# People: Mood maze



Suspicious → *reassure* → Hungry → *feed* → Grateful
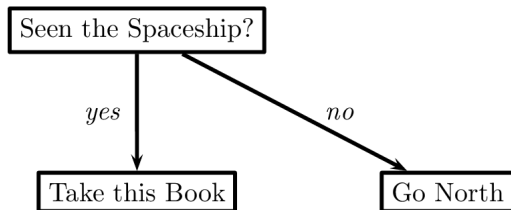
- Starting out in the *feed* direction leads nowhere

# People are not automatons

- Should also add some spontaneous and random behavior to distract the player and add realism
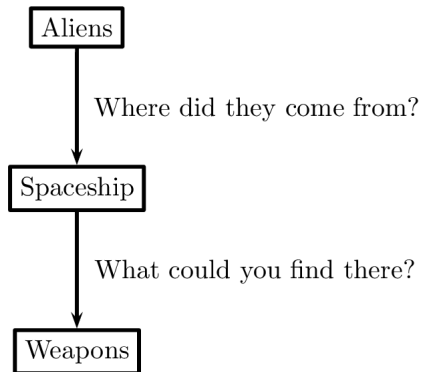- See 'Galatea' for an entire game made of conversation, or 'Glass' for a short one

# Dialogue Trees



- Routine

# Dialogue Mazes

- NPC can have a *goal* to get you to a *subject*.

# Ropes and chains

- Ropes and chains are so versatile they are almost impossible to program correctly.
- 'Otranto,' is a good example in the Inform 7 documentation, so that a rope can be used to tie one thing to another, climb with, and drag stuff.

# Riddles

- Always fun
- Symphosius:
  `http://penelope.uchicago.edu/Thayer/E/`
  `Roman/Texts/Symphosius/home.html`
- The Book of Exeter:
  `http://www.technozen.com/exeter/index.htm`

# Symphosius

*Upon the finger my small weight is set*
*You scarce would feel my presence there, and yet*
*With my one shape, I many forms beget.*

# Symphosius

*Great deeds with little strength I do,*
*I close the open, ope the closed for you.*
*I keep the master's house, the master keeps me, too.*

# Symphosius

*The earth my body, strong through fire am I,*
*Though born of earth, my place is still on high,*
*And early drenched with dew, I soon am dry.*

# Book of Exeter

*I saw a creature wandering the way:*
*She was devastating—beautifully adorned.*
*On the wave a miracle: water turned to bone.*

# Book of Exeter

*I'm a strange creature, for I satisfy women,*
*a service to the neighbors! No one suffers*
*at my hands except for my slayer.*
*I grow tall, erect in a bed,*
*I'm hairy underneath. From time to time*
*a good-looking girl, the doughty daughter*
*of some churl dares to hold me,*
*grips my russet skin, robs me of my head*
*and puts me in the pantry. At once that girl*
*with plaited hair who has confined me*
*remembers our meeting. Her eye moistens.*

# Book of Exeter

*In the town I saw a creature*
*which feeds the cattle. It has many teeth;*
*its beak is useful as it points down,*
*gently plunders and turns for home;*
*it searches for plants along the slopes,*
*and always finds those not rooted firmly;*
*it leaves the living ones held by their roots,*
*quietly standing where they spring from the soil,*
*brightly gleaming, blowing and growing.*

# Book of Exeter

*I'm by nature solitary, scarred by iron*
*and wounded by sword, weary of battle.*
*I often see the face of war, and fight*
*hateful enemies; yet I hold no hope*
*of help being brought to me in battle*
*before I'm cut to pieces and perish.*
*At the city wall sharp-edged sword,*
*skillfully forged in the flames by smiths,*
*bite deeply into me. I must await*
*a more fearsome encounter; it is not for me*
*to find a physician on the battlefield,*
*one of those men who heals wounds with herbs.*
*My sword wounds gape wide and wider;*
*death blows are dealt me by day and by night.*

# Emily Dickinson Riddles

*I like to see it lap the miles,*
*And lick the valleys up,*
*And stop to feed itself at tanks;*
*And then, prodigious, step*

*Around a pile of mountains,*
*And, supercilious, peer*
*In shanties by the sides of roads;*
*And then a quarry pare*

*To fit its sides, and crawl*
*between,*
*Complaining all the while*
*In horrid, hooting stanza;*
*Then chase itself down hill*

*And neigh like Boanerges;*
*Then, punctual as a star,*
*Stop—docile and omnipotent—*
*At its own stable door.*

# Emily Dickinson Riddles

*It sifts from Leaden Sieves —*
*It powders all the Wood.*
*It fills with Alabaster Wool*
*The Wrinkles of the Road —*

*It makes an Even Face*
*Of Mountain, and of Plain —*
*Unbroken Forehead from the East*
*Unto the East again —*

*It reaches to the Fence —*
*It wraps it Rail by Rail*
*Till it is lost in Fleeces —*
*It deals Celestial Vail*

*To Stump, and Stack—and Stem—*
*A Summer's empty Room—*
*Acres of Joints, where Harvests were,*
*Recordless, but for them—*

*It Ruffles Wrists of Posts*
*As Ankles of a Queen—*
*Then stills its Artisans—like Ghosts—*
*Denying they have been—*

# Emily Dickinson Riddles

A narrow fellow in the grass
Occasionally rides;
You may have met him,–did you not,
His notice sudden is.

The grass divides as with a comb,
A spotted shaft is seen;
And then it closes at your feet
And opens further on.

He likes a boggy acre,
A floor too cool for corn.
Yet when a child, and barefoot,
I more than once, at morn,

Have passed, I thought, a whip-lash
Unbraiding in the sun,–
When, stooping to secure it,
It wrinkled, and was gone.

Several of nature's people
I know, and they know me;
I feel for them a transport
Of cordiality;

But never met this fellow,
Attended or alone,
Without a tighter breathing,
And zero at the bone.

# Decipherment

- Secret codes, if they are more than simple ciphers, are usually enjoyed.
- Rebus, picture language, *etc.* should fit with the character of the game (hieroglyphics for pyramids)

# Puzzles: Clues

- Hints should be provided in-game for the difficult puzzles.
- In modern IF, clues are essential and you should, with *very* careful reading, be able to solve puzzles on the first go.
- Can be literal (muddy footprints) or literary (puns, genre, *etc.*)
- Generally, eschew in-jokes. Although in this context, references to WWU or the Comp Sci Department faculty are probably OK.

# Luck

- Small chance variations add fun
- The pirate in ADVENT, the thief in Zork
- Can be overdone
- Can lead to the Save-Try-Restore cycle

# Multiple solutions

- Good puzzles have many solutions, adding to the realism
- There are seven ways to open the child-proof medicine bottle in 'Curses'.
- 'Wishbringer' has a magic stone to solve puzzles, but can only be used seven times.
  - The user of the magic stone can choose which puzzles are too hard, this time around.

# Puzzle Rewards

- The player gets to continue the game.
- But there should also be an immediate reward, more items, more rooms, more information, ...

# Room Descriptions

- Write them properly as you go.
- Important for the story.
- Nothing more depressing than having nothing left but 50 rooms to describe. Prose suffers.
- Describe the room sparingly, and let the object descriptions carry some of the work.
- Don't be flippant.
- Use subtle humor: *On the wall by the bed is a slightly curved, full-length mirror. You reflect upon this for a while.*

# Exits

- Describe exits better than: "You can go up, down, or north."
- Sometimes you don't have to describe exits:
  ```
  >south
  The only exit is back out north to the sea-shore.
  ```

# Eschew "you"

- ▶ You are in ...
- ▶ You find yourself in ...
- ▶ This is ...
- ▶ You have come to ...

Just describe the room:

**Fort James**
The enclosure of Fort James is a large, roughly hexagonal court walled with heavy stone. The walls face the entrance to Port Royal Harbour, and the battery of guns is prepared to destroy any enemy ship arriving.

# Vocabulary Counts

Be specific:

- A tree ...

# Vocabulary Counts

Be specific:

- A tree ...
  An aged elm ...

# Vocabulary Counts

Be specific:

- A tree ...
  An aged elm ...
- A car ...

# Vocabulary Counts

Be specific:

- A tree ...
  An aged elm ...

- A car ...
  A silver Ferrari F430 Spider ...

# Vocabulary Counts

Be specific:

- A tree ...
  An aged elm ...

- A car ...
  A silver Ferrari F430 Spider ...

- A man ...

# Vocabulary Counts

Be specific:

- A tree ...
  An aged elm ...

- A car ...
  A silver Ferrari F430 Spider ...

- A man ...
  A wretched soul, pulling scraps of food from the dumpster, gray wisps of hair floating from beneath a greasy stocking cap, ...

# Eschew adjectives

*Whirlpool Room*
You are in a magnificent cavern with a rushing stream, which
cascades over a sparkling waterfall into a roaring whirlpool which
disappears through a hole in the floor.

# Write using all senses

*Whirlpool Ledge*

The path runs a quarter-circle from south to west around a broken ledge of this funnel cavern. A waterfall drops out of the darkness, catching the lamplight as it cascades into the basin. Rapid currents whip into a roaring whirlpool below.

Blue-green algae hangs in clusters from the old guard-railing, which has almost rusted clean through in the frigid, soaking air.

# Good writing is suggestive

- Is there a use for iron oxide from the rust?
- Are there insect-eggs in the algae, usable for bait?
- Can you break off the railing itself and use pieces of it?
- Can you dive into the pool below?
- Is there something dry which would become wet if I brought it here?
- Does the water have a hypnotic effect when you stare at it?

# Multiple descriptions

- Different times of day can affect the description
- Different lights can reveal things (ultraviolet lamps)
- Different characters can see the room differently (dogs sniffing)
- 'Suspended' sees things through several different robots.

# Scoring

- Award ranks as player accumulates score
- Probably no "perfect" score, since there are many paths through these games.
- Some games have no score at all, but "right" and "wrong" endings.

# Testing

- Gareth Rees kept a log of all 475 modifications to 'Christminster'
  - 224 reports requested additional interactivity
  - 86 incorrect responses of inconsistencies
  - 32 typographical errors
  - 79 mistakes in computer programming

# Handling All Input

Most of the player's time at the keyboard is spent trying incorrect things, and so the game is judged by how well it deals with those.

```
In the aquarium is a baby sea-serpent who eyes you
suspiciously.  His scaly body writhes about in the
huge tank.

>
```

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>Take serpent
```

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Most of the player's time at the keyboard is spent trying incorrect things, and so the game is judged by how well it deals with those.

```
In the aquarium is a baby sea-serpent who eyes you
suspiciously.  His scaly body writhes about in the
huge tank.

>Take serpent

He takes you instead.  *Uurrp!*
```

# Bugs

From 'Suspect':

```
>bartender, give me a drink
```

# Bugs

From 'Suspect':

```
>bartender, give me a drink
"Sorry, I've been hired to mix drinks and that's
all."
```

# Bugs

From 'Suspect':

```
>bartender, give me a drink
"Sorry, I've been hired to mix drinks and that's
all."

>dance with alicia
```

# Bugs

From 'Suspect':

```
>bartender, give me a drink
"Sorry, I've been hired to mix drinks and that's
all."

>dance with alicia
Which Alicia do you mean, Alicia or the overcoat?
```

# Bugs

From 'Suspect':

```
>bartender, give me a drink
"Sorry, I've been hired to mix drinks and that's
all."

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Which Alicia do you mean, Alicia or the overcoat?

>talk to veronica
```

# Bugs

From 'Suspect':

```
>bartender, give me a drink
"Sorry, I've been hired to mix drinks and that's
all."

>dance with alicia
Which Alicia do you mean, Alicia or the overcoat?

>talk to veronica
Veronica's body is listening.
```