CMPS 148/248: Interactive Storytelling

Course Overview
Expectations, Grading

Introduction
Stories, Telling, and Interaction
• CMPS 148/248
• Professor: Arnav Jhala (jhala@cs.ucsc.edu)
  – Office Hours: Monday 3 to 4:30 and by appointment
• Teaching Assistant: Ben Samuel (benjamin.m.samuel@gmail.com)
Class Information

• Website
  www.soe.ucsc.edu/classes/cmps148/Winter10

• Schedule (Lecture slides, notes, due dates)
• Homework and Project Information
  – Description and Evaluation Criteria
• Resources (Links to articles, tutorials, examples, etc.)
• Twitter: CMPSX48 (send in a follow request)
• OpenStudy (http://www.openstudy.com)

• Keep up with class readings
Introductions

• Professor
• Teaching Assistant
• Students
  – Name
  – Major
  – One Favorite Book, TV Series, Movie, and Game.
Interactive Storytelling

• What is Interactive Storytelling?
  – Story (sense-making)
  – Telling (form of communication)
  – Interaction

• Differences
  – Non-Interactive
  – Interactive

“I won't go so far as to say that interactivity and storytelling are mutually exclusive, but I do believe that they exist in an inverse relationship to one another...

Interactivity is almost the opposite of narrative; narrative flows under the direction of the author, while interactivity depends on the player for motive power...”

Ernest Adams in Gamasutra
Why are we talking about it?

• Interactive Systems
  – Focus not only on presentation but also on manipulation
  – Users demand adaptive experiences

• Challenges
  – Story Understanding
  – Immersion
  – Adaptation
  – Dramatic Impact
  – Balancing
  – ....
Holy Grail?
Point-of-View

• Are all holodeck experiences story?
• What about point-of-view?
Disparities of Knowledge

Diagram with numbered arrows and letters indicating movement or connections.
Interactivity

• Limitations of First-Person experiences
• Are there stories where interactivity is inappropriate or difficult to incorporate?
Interactive Fiction

• Examples
Interactive Fiction

• Examples
Interactive Fiction

• Examples
Interactive Fiction

• Examples

ZORK I: The Great Underground empire
Copyright (c) 1981, 1982, 1983 Infocom, Inc. All rights reserved.
ZORK is a registered trademark of Infocom, Inc.
Revision 88 / Serial number 840726
West of House
You are standing in an open field west of a white house, with a boarded front door.
There is a small mailbox here.
>open mailbox
Opening the mailbox reveals a leaflet.
>read leaflet
(taken)
"WELCOME TO ZORK!

ZORK is a game of adventure, danger, and low cunning. In it you will explore some of the most amazing territory ever seen by mortals. No computer should be without one!"
Interactive Fiction

- Examples

Grace, are you angry at Trip?
Interactive Fiction

• Examples
Interactive Fiction

• Examples
Course Structure

- Part the First: Story
  - What is story?
  - How are stories created by authors?
  - What makes stories interesting?

- Part the Second: Telling
  - What are the various media in which stories are/can be told?
  - How are stories manipulated while they are narrated/told?
  - What are the elements of various media that communicate story elements to get the best dramatic effect?

- Part the Third: Interaction
  - How do we proceduralize narrative?
  - How can we make interaction easy and allow users to freely manipulate stories?
  - How can we evaluate automatically generated narratives for dramatic impact and aesthetic properties?
Procedural Narrative

• Narrative that adapts with interaction
• Requires intelligent world-manipulation
  – Techniques from Artificial Intelligence
• Challenges
  – Procedural generation of story
  – Understanding user’s intent
  – Managing user interaction
  – Driving the world and other characters to adapt to changing story events
• Can stories be described with a small number of narrative functions and with specific ordering constraints?
  – Vladimir Propp investigated this for Russian Folktales
  – Identified Morphemes (parameterized story events that perform a specific narrative function)
  – Developed a grammar (rules for combining and ordering morphemes)
Story Generation from Propp’s Grammar

ABC↑DEFG HJK↓Pr−Rs0 L 
MJNK↓Pr−Rs Q Ex TUW*

Hartmann et al
Sample story and grammar

once upon a time there lived a dog. one day it happened that farmer evicted cat. when this happened, dog felt pity for the cat. in response, dog sneaked food to the cat. farmer punished dog.

story → setting + episodes
episodes → episode + episodes
episode → story_event + emotional_response + action_response

Joseph story generator – R. Raymond Lang
Intelligent Authoring System

• Model authorial knowledge beyond story structure

• Examples: Authorial goals, plans, knowledge about the world
Character Authoring Example (Universe)

Name: Liz Chandler

Marriages:
  - Don Craig [1980]
  - Tony Dimera

Stereotypes: Actor, Knockout, Socialite, Party-goer

Trait modifiers: (Sex F) (Age young-adult) (Wealth 3) (Promiscuity -3) (Intelligence 3)

Description:

- Wealth 8
- Promiscuity 3
- Competence NIL
- Niceness 0
- Self-Conf 6
- Guile 7
- Naiveté 7
- Moodiness 6
- Phys-Att 7
- Intelligence 7
- Age young-adult
- Sex F

Goals: (Find-Happiness Become-Famous Meet-Famous-People)
Example plot fragment

Plot fragment: forced-marriage


Constraints: (has-husband ?her) (has-parent ?husband)
( < (trait-value ?parent ‘niceness) –5)
(female-adult ?her) (male-adult ?him)

Goals: (churn ?him ?her) {prevent them from being happy}

Subgoals: (do-threaten ?parent ?her “forget it”)
(dump-lover ?her ?him)
(worry-about ?him)
(together * ?him)
(eliminate ?parent)
(do-divorce ?husband ?her)
(or (churn ?him ?her)
   (together ?her ?him))
Minstrel’s Architecture

- Episodic Memory
- Imaginative Memory
- Adapt Past Solutions
- Assess Solutions
- Solution

Active TRAM: Standard-Problem-Solving & Other TRAMs

Transform Original Problem

Domain Assessments Boredom Assessment

Problem Specification
There is a woman named Jasmine. There is a king named Jafar. This is a story about how King Jafar becomes married to Jasmine. There is a magic genie. This is also a story about how the genie dies. There is a magic lamp. There is a dragon. The dragon has the magic lamp. The genie is confined within the magic lamp. King Jafar is not married. Jasmine is very beautiful. King Jafar sees Jasmine and instantly falls in love with her. King Jafar wants to marry Jasmine. There is a brave knight named Aladdin. Aladdin is loyal to the death to King Jafar. King Jafar orders Aladdin to get the magic lamp for him. Aladdin wants King Jafar to have the magic lamp. Aladdin travels from the castle to the mountains. Aladdin slays the dragon. The dragon is dead. Aladdin takes the magic lamp from the dead body of the dragon. Aladdin travels from the mountains to the castle. Aladdin hands the magic lamp to King Jafar. The genie is in the magic lamp. King Jafar rubs the magic lamp and summons the genie out of it. The genie is not confined within the magic lamp. King Jafar controls the genie with the magic lamp. King Jafar uses the magic lamp to command the genie to make Jasmine love him. The genie wants Jasmine to be in love with King Jafar. The genie casts a spell on Jasmine making her fall in love with King Jafar. Jasmine is madly in love with King Jafar. Jasmine wants to marry King Jafar. The genie has a frightening appearance. The genie appears threatening to Aladdin. Aladdin wants the genie to die. Aladdin slays the genie. King Jafar and Jasmine wed in an extravagant ceremony. The genie is dead. King Jafar and Jasmine are married. The end.
Fabulist

Order (King, Aladdin, (has King lamp))

Travel (Aladdin, Castle, Mountain)
(at Aladdin Mountain)
(at Aladdin Mountain)

Slay (Aladdin, Dragon, Mountain)
(not alive Dragon)

Pillage (Aladdin, Lamp, Dragon, Mountain)
(has Aladdin Lamp)

Travel (Aladdin, Mountain, Castle)
(at Aladdin Castle)

Give (Aladdin, Lamp, King, Castle)
(has King Lamp)

Summon (King, Genie, Lamp, Castle)
(at Genie Castle)
(controlls King Genie)

Love-Spell (Genie, Jasmine, Castle)
(loves Jasmine King)

Marry (King, Jasmine, Castle)

Appear-Threatening (Genie, Aladdin, Castle)
(at Genie Castle)

Slay (Aladdin, Genie, Castle)
(at Genie Castle)
Interactive Drama

Plot structure

- Time
  - Exposition
  - Inciting incident
  - Rising action
  - Crisis
  - Climax
  - Falling action
  - Denouement

Characters

- Personality
- Emotion
- Self motivation
- Change
- Social relationships
- Consistency
- Illusion of life
Author has control but

- All interaction paths must be pre-coded by author
- Can only make very small stories
- Bits of story can’t be incrementally added
Drama management

- Policy for “story piece” selection
- An alternative to explicitly coded links
General interactive drama architecture