Future Directions in Interactive Fiction

CS 395 Computer Game Design
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Overview

• Where is interactive fiction now?
• Where is interactive fiction going?
  – Bates’ Oz Project
  – Crawford’s Erasmatazz
  – Hayes-Roth’s Virtual Theater
  – Perlin’s Improv project
Recall our model of game design

- **Story**: How you want the player to think of the game. Its plot and activities, expressed in terms of the imagined world.
- **Model**: The rules and laws of the imagined world as instantiated in the game. What kinds of things there are in it (*ontology*), its physics and sociology.
- **Implementation**: The software that implements the model and whose execution provides the player’s experience.
Sources of Immersion (aka “Time warp factor”)

• Engaging imagined world
  – Exciting/intriguing story line, events

• Engaging modeled world
  – Great descriptions (text or graphics)
  – Charming details (e.g., chain vomiting in Theme Park)

• Avoiding discrepancies between modeled and imagined world
  – Can’t do “obvious” action
  – Actions have unrealistic consequences

• Key design issue: Richness/Discrepancy tradeoff
Text-based interactive fiction

- Driving force: Implementation choice of text descriptions and commands as interface
- Minimal model: Discrete locations, actions, time, and events.
  - Inform provides rich modeling language, but doesn’t have floating point!
- Richer models are possible but rare
  - e.g., Infocom’s Border Zone synched game time to real time
  - Continuous change may be poor match for interface
Evolution in graphics helps drive evolution of interactive fiction

• More 2D graphics
  – Mouse-hunt games

• More video intense
  – More cut scenes
  – Player as steering video stream

• More 3D graphics/animation modeling
  – Exploiting stunning rise in 3D rendering hardware
  – Limitations:
    • Modeling requires substantially more resources
    • NPC actions/movements tightly scripted
New direction: Adding Intelligence

• Graphics will continue to evolve
  – Provides richer canvas for the imagined world
  – Richer canvas ⇒ rapid increase in complexity of authoring

• Revolutionary changes are coming from AI technology
  – Richer models of characters
  – Richer models of social interactions
  – Ability to embed author’s intent into structure of the world
  – Richer world infrastructures ⇒ higher immersion experiences
Oz Project (CMU)

• Goal: Creation of interactive drama
• Requires
  – Believable Agents
  – Drama Managers
Believable Agents

• Things (hardware or software) that act alive
• For stories, serve as other characters in plot
• Also finding uses in
  – Educational software (guides, e.g., Lester’s work at UNC)
  – Computer interfaces more generally
What is needed for storytelling?

• Personality
  – What makes someone unique

• Emotion
  – Exhibiting their own, and responding to others appropriately

• Self-motivation
  – Their own drives and goals help govern their behavior

• Social relationships
  – Consistent and evolving interactions with others over time

• Change
  – They learn and grow, consistent with their personality

• Broadly capable
  – Can carry out a rich variety of behaviors in pursuit of their goals in an interactive environment
Intelligence and believability

• Must be smarter than today’s NPCs
  – avoid brittleness
• Don’t have to be brilliant
• Don’t even have to be human-level intelligence
  – Space of interactions only has to support needs of the story
Example:
Edge of Intention

• Simple, 3D animated world
• The Woggles
  – move by bouncing from place to place.
  – have “body language”, expressing emotions by changing shape
  – have social relationships
  – engage in social behavior
Interaction

• The player’s avatar is also a woggle
• By interacting with woggles, you find out about their social structure.

No plot, but very engaging behaviors
  – Personalities of woggles become quickly clear
  – Threaten one, its friend intervenes to try and scare you off
  – Join or start games of follow the leader
Drama management

• Authoring involves creating a dramatic arc
  – Fixed in traditional fiction
  – Various branching structures possible in interactive fiction

• Problem: How to tell a great story while giving player freedom?
  – Complexity of possible branching in rich worlds quickly makes authoring unmanageable
  – Usual solutions of sharply limiting world or player restrictive
Storytelling as Search

• Consider a story as a sequence of scenes
  – Scene = significant event/turning in the plot
  – Lots of variability in how a scene plays out

• Scenes and relationships between them form a space of possible plots
  – Relationships that must hold between scenes structure the space
  – Some relationships inviolable
    • e.g., establishing prerequisite
  – Some can be varied
    • e.g., establishing motivation for an action before or after the action itself
Drama Manager

• Given:
  – Evaluation function that rates sequences of scenes
  – Methods for affecting the game

• Ensure:
  – The sequence of scenes a player experiences corresponds to a good story

Where player is now

Choice of next scene determined by dramatic potential of possible futures
Drama management as metagaming

• Drama Manager in effect is playing a game
  – Presumably non-adversarial
  – Ideally, the player doesn’t know that it is there

• “Moves” for the Drama Manager
  – Changing behavior of NPCs
  – Random events in the world
  – Acts of God
Crawford’s Erasmatazz

• Interactive storytelling = you interact with characters in an authored world
  – Menu-based interaction
• Player focus is on interacting with NPCs rather than physical actions
• Overall story scripted by author, but no drama manager
• Interesting part is modeling
  – Moods: Anger, arousal, joy, fear
  – 21 personality traits (e.g., integrity, timidity, …)
Hayes-Roth’s Virtual Theater Project

• Uses AI blackboard technology as implementation for characters
• Simple numerical personality models
• Examples
  – Kids tell stories by giving puppets high-level instructions
  – Agents as social facilitators in shared environments (Erin the bartender)
Perlin’s Improv project

- Uses layered architecture inspired by robotics, animal research to provide high-level animation capabilities
- Animator specifies high-level actions and moods, the model of the character does the rest
Ken Perlin’s Responsive Face demo