Lecture 27

Dialogue
Elements of Game Narrative

- **Characters**
  - Protagonist: player controlled character
  - Supporting characters: NPCs

- **Storyline**
  - How does the story progress?

- **Dialogue**
  - Story vehicle in games and fiction
  - Easy way to allow player choice
Primary interactive story vehicle
- Where the player most likely has choice
- If no choice, might as well be a cut scene

Non-gameplay interactions reduce to dialogue
- Dialogue: conversation of two or more entities
- Animated responses are non-textual dialog
- Interactive cut scenes are a response to player
Dialogue: Real Life

- Greet and make contact
- Fill in time/silence
- Gain information
- Reveal information
- Discuss ideas and opinions
- Express emotion
- Propose a course of action
- Acknowledge comment
- “Hi; my name is Bob.”
- “Nice party, isn’t it?”
- “What do you do, Bob?”
- “I design video games.”
- “Isn’t that a bit juvenile?”
- “You are such an idiot.”
- “Then prove me wrong.”
- “Sure, I can do that”
Dialogue: Fiction

- **Reveal information**
  - “Expository dialog”
  - Do not say the obvious

- **Reveal character**
  - Identify with protagonist
  - Empathy with companions
  - Hatred for enemies

- **Break up the narrative**
  - Description very passive
  - Goal: show, don’t tell
Dialogue: Games

- Reveal information
  - Story as investigation
  - Integrate with gameplay

- Reveal character
  - Reveal NPC personalities
  - Define player personality
  - Heightens sense of risk

- Break up the monotony
  - In-game humor
  - “NPC banter”
NPC Banter: *Dragon Age*
Standard Approach: Dialogue Trees

I'm ready to continue research on the last chapter. Have you thought about disarming the bomb? I've been thinking about your experiments. Can I ask you something personal?
Example: Avernum Series

Mother Twymon

Mother Twymon speaks with you, always positioning herself to show off her jewelry and robes to good effect. "So, warrior. What else can the Shrine of Divine Attainment offer you today?"

1. Tell me about your church.
2. I’d like to know more about Spire. And the death of the mayor.
3. Can you teach me any spells?

Dialogue
More than Just Talk

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<th>Actions</th>
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Preconditions: Not everyone is talkative, Test for dialogue option, Like rule-based AI.

Actions: Talking may alter state, State of player character, State of participating NPC.

Symbolic preconditions: Quest completed, Speaking for first time.

Symbolic actions: Complete quest, Open up new dialogue.

Numeric preconditions: Reputation points, Money on hand.

Numeric actions: Give player money, Increase reputation.
More than Just Talk

Preconditions

- Not everyone is talkative
- Test for dialogue option
- Like rule-based AI

Symbolic preconditions

- Quest completed
- Speaking for first time

Numeric preconditions

- Reputation points
- Money on hand

Actions

- Talking may alter state
- State of player character
- State of participating NPC

Symbolic actions

- Complete quest
- Open up new dialogue

Numeric actions

- Give player money
- Increase reputation

This Looks Like Gameplay Design
Dialog Trees: Symbolic Effects

![Diagram of a dialog tree with nodes labeled as questions and responses, starting from a 'start' node, branching out to multiple question nodes, with some responses marked as unlocked!]

- **Player**
- **NPC**
- **Player**
Symbolic Effects and Faction Based Storylines

Story A
Unlocked

Story B
Locked

Story C
Unlocked

Unlock B
Lock C

Dialogue
This Looks Familiar…
### Dialogue vs. Interactive Fiction

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<th>Similarities</th>
<th>Differences</th>
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<td>• Both have <strong>graph</strong> structure</td>
<td>• Graph <strong>temporal</strong>, not <strong>spatial</strong></td>
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<tr>
<td>• Shows flow between text</td>
<td>• Often visit node only once</td>
</tr>
<tr>
<td>• Only have discrete choices</td>
<td>• Limited “back-up” ability</td>
</tr>
<tr>
<td>• Basically a game flowchart</td>
<td>• “Lock-out” is a big worry</td>
</tr>
<tr>
<td>• <strong>Edges</strong> may need <strong>unlocking</strong></td>
<td>• Not designed as <strong>one graph</strong></td>
</tr>
<tr>
<td>• Requires resource to access</td>
<td>• A graph for each person</td>
</tr>
<tr>
<td>• <strong>Example</strong>: have enough gold</td>
<td>• Or per person/per act</td>
</tr>
<tr>
<td>• <strong>Example</strong>: talk to person $X$</td>
<td>• Tie together with resources</td>
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<tr>
<td>• “Lock-and-key” puzzles</td>
<td>• <strong>No text parsing</strong> of dialogue</td>
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Implementing Dialog Trees

- Node for each player choice
- Including the initial “hello”
- Contains NPC response, but can depend on game state
- Also code that specifies what this does as an action
- Pointers to follow-up dialog
- Data-driven design is simple
- Index nodes by numbers
- Numbers give tree structure
- Simple scripting for actions

```c
beginTalkNode 85;
    state = 76;
    nextstate = -1;
    condition = 1;
    question = "Grass is offering a bounty?";
    text1 = "They claim justice isn't being done. But look around! There's famine and war! We don't have time for justice! I'd be happy to keep things calm."
endTalkNode;

beginTalkNode 86;
    state = 78;
    nextstate = -1;
    condition = gf(128,15) == 1 && gf(103,1) == 1;
    question = "I had to kill Koeppe."
    text1 = "What? You do know he has friends here, don't you. Hope they don't find out you did it. I won't tell them, but ... He shakes his head.;
    text2 = "Those fools in Grass. They don't know how hard it is to keep a mob from crossing their bridges. And now I have just that much more work to do. He shakes his head."
    code =
        set_flag(128,15,2);
        toggle_quest(77,3);
        break;
endTalkNode;

beginTalkNode 87;
    state = 78;
    nextstate = -1;
    condition = gf(128,15) == 1 && gf(103,1) == 2;
    question = "I sent Koeps to you."
    text1 = "Estreon nods. He got here. I put him in chains and sent him east. He'll be in a cell somewhere for a while, until things calm down. The people didn't like that, but nothing I can't handle."
    text2 = "Thanks for your help. Now everyone will be angry, but not angry enough to start killing. Here's a little something for your troubles. He gives you a beautiful, polished cavewood bow and a pouch of coins."
    code =
        set_flag(128,15,2);
        toggle_quest(77,3);
        reward_give(93);
        change_coins(300);
        break;
endTalkNode;

beginTalkNode 88;
    state = 78;
    nextstate = -1;
    condition = gf(128,16) == 0;
    question = "It is very important."
    text1 = "Oh, I am sure it is. And, as I said, I'll let him know you were by. I'd let you through the gate, but, you know, regulations. I'm not allowed to let just anyone in without orders. Sorry."
endTalkNode;
```
Dialogue and Gameplay

- Often easy to combine them
  - Resources affect gameplay
  - Dialogue **needs** resources
  - Dialogue **alters** resources

- When is dialogue a game?
  - Dialogue has own resources
  - No usage outside dialogue

- **Reputation systems**
  - Points measuring good/evil
  - Gain points from dialogue
  - Unlocks more dialogue
Reputation: Advantages

Story A
Add Resource

Story B
Add Resource

Story C
Add Resource

Story D
Needs Resource > x
Dialogue
Dialogue and Gameplay

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Reputation: Feedback Loops

- Reputation ever increasing
  - Good points for Good acts
  - Good acts give Good points

- Need to use them somehow
  - Otherwise, why get them?
  - Raise requirements over time
  - Escalating “lock-and-key”

- Creates black/white morality
  - Stop good acts; no good points
  - Too few Bad points to change
  - Stay good/bad all the way
Other Forms of Reputation

• Nonexclusive morality
  • Can anywhere in spectrum
  • **Example**: Mass Effect 3
  • But meaningful choice?

• Character by character
  • Each character has an approval/friendship rating
  • Affected by actions, as well as **tone** of your dialogue
  • Inter-NPC rivalries affect your relationships with each
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2+ questions, 1 response
  • More compact than tree
  • No redundant information

Why so many questions?
  • Actions, not speech
  • “I don’t know”

Example: Reputation
  • Evil option (–repute)
  • Good option (+repute)
  • Tone of voice
NLP and Game Dialogue

- **Natural Language Processing**
  - Understand *any* sentence
  - Major area of CS research

- NLP in games?
  - Type in arbitrary sentence
  - NPCs react appropriately
  - Several experiments in 90s

- Generally avoided today
  - Nontrivial chance of failure
  - Any dialogue failure is bad!
  - Hard to write NPC reactions
**NLG and Game Dialogue**

- **Natural Language Generation**
  - **Given**: complex set of data
  - **Outcome**: comment on data
  - Also an area of CS research

- **Comment requirements**
  - Must be *simpler* than data
  - Should also be *natural*

- **Sample applications**
  - Sports commentary
  - Party combat chatter
  - Intelligent townsfolk
**NLG and Game Dialogue**

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**Much More Successful Than NLP**
Often a set of “canned” text
- React to specific events
- NPC picks text as appropriate

Text is parameterized
- “What do we do, <name>?”
- “Someone killed <monster>!”
- “That was <numb> days ago.”

Choosing text to say
- Favor important events?
- Favor recent events?
- Random (pull-toy)?
Drama Managers

- Freeform component design
  - Player can do any action
  - AI matches to component
  - Choice may be contextual
- Built for dramatic tension
  - Tracks the current tension
  - Picks storyline options most consistent with tension
- Guide player through hints
  - Help understand context
  - “You need a drink.”
**Façade Story Structure**

- Story broken into **beats** and **joint dialogue behaviors**
  - JDBs are 1-5 lines between Trip & Grace (banter)
  - Beat is 10-100 JDBs resolving single plotline

- Storyline designed with goals and mix-ins
  - Goals specify how story proceeds if no interaction
  - Mix-ins give the player opportunities to join in

- AI planning algorithms used for **dramatic tension**
  - Each JDB is an operator that affects on dramatic tension
  - Pick JDBs consistent with story, that best build tension
Drama Manager in *Façade*

![Diagram of Drama Manager and Story Memory](image)

- **Drama Manager** (sequences beats)
  - Bag of beats
  - Desired value arc(s)
  - Selected beat

- **Story Memory**
  - Current story values
  - Previous action time
  - Activity not part of a beat

- **Story World**
  - Player
  - Trip
  - Grace

- **Natural Language Processing**
  - Surface text → discourse acts
  - Discourse acts → reactions

---

Dialogue

[Source: the game design initiative at Cornell University]
Drama Manager in *Façade*

Drama Manager (sequences beats)

- Bag of beats
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Story Memory

- Current story values
- Previous action time

Natural Language Processing

- Surface text \(\rightarrow\) discourse acts
- Discourse acts \(\rightarrow\) reactions

Articles Online (Advanced)
Summary

- Interactive storytelling reduces to **dialogue**
  - Primary area where character has choice in story
  - Other options abstract to “dialogue with the game”

- Dialogue is often constructed as **graphs**
  - Edges represent dialogue flow
  - Some edges may need to be unlocked

- This is an area of very **active research**
  - Personalization requires natural language generation
  - Drama managers lead to more open-ended play