Lecture 24

Level Design
What is Level Design?

- Layout of **game geography**
  - Location and relationship of challenges
  - Movement of dynamic features (e.g. NPCs)

- Understanding of **player capabilities**
  - Abilities, mechanics available to the player
  - Assumptions of current player skill level

- Layout of **player progression**
  - How the player should move through the game
  - How the player visualizes this progression
Aspects of Game Design

- Games as **Exploration**
  - Focuses on game *geography* and *capabilities*
  - Typically involves heavy storyboarding

- Games as **Education**
  - Train player skill and understanding
  - Focuses primarily on *player capabilities*

- Games as **Storytelling**
  - Focuses on *player progression*
  - Most challenging element of game design
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For a later lecture
Aspects of Game Design

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Players Want to Explore the World

- Exploring the **physical space**
  - What happens when I go here?
  - **Example**: Any western RPG
  - But does not require complex game world

- Exploring the **ludic space**
  - What happens when do this action?
  - Requires deep, complex interactions
  - **Example**: Buckets in Skyrim
Storyboarding

- Diagrams player action throughout level
  - Different from film storyboarding
  - Currently a bunch of *informal practices*

- **Embodied Action**
  - Action that is tied to a character/avatar
  - Typically maps player movement in level

- **Disembodied Action**
  - Action corresponding to UI elements
  - **Example**: Buttons, menus
Embodied Action: Single Scene
Embodied Action: Multiple Scenes

![Diagram showing multiple scenes of a character's embodied action, including points of interest and actions such as moving, plugging in, grabbing lights, walking, and winning.]
Disembodied Action: Cause and Effect

- **Draw the initial scene**
  - Could be the entire level
  - Zoomed in portion of screen
  - Must capture area that will be affected by the action

- **Indicate the action**
  - Draw mouse pointer
  - Indicate gamepad button
  - Annotate with a “tool tip”

- **Draw the action effect**
  - Change in initial scene
Game Geography

- Relations of game challenges
  - Multiple challenges in a level
  - Flow of level progression
- Easiest to design *discretely*
  - Well defined player paths
  - Some deviation allowed
  - Storyboard indicates paths
- Ensure *meaningful choice*
  - More than one path works
  - Balance the risk vs. reward
Design Patterns

- Design uses building blocks
  - Mechanic/challenge pairs
  - Start and end location
  - String together to make level

- Key building block features
  - Requires verb/interaction
  - Must be possible to *fail*
  - Difficulty is *tunable*

- **Patterns** are common blocks
  - Appear many times in game
  - Even across multiple games
Design Pattern Examples

**Platformer**

- Start
- Tricky Jump
- End

**Stealth Game**

- Start
- Avoid Detection
- End
Design Pattern Examples

Shooter/Action Game

- Cover
- Cover
- Cover
- Kill Enemies
- Cover

Racing Game

- Brake
- Gain Speed
Dash: Basic Design Patterns
Dash: Putting it All Together
Composite Patterns

• Piecewise design creates a very linear feel
  • Pattern A followed by Pattern B followed by...
  • Player is explicitly aware of building blocks

• Composite patterns allow for variations
  • Two patterns combined in the same space
  • Makes original pattern much more difficult
  • Player now has to react to them both

• Reading: Extended/Evolutionary Challenge
Composite Patterns

Platformer

Interceptor

Force Jump

Stealth Game

Chaser
Composite Patterns

Shooter/Action Game

Cover

Cover

Cover

Cover Busters

GRENADEx!

Racing Game

Cover

Cover

Cover

Restrict Positions
Is Linearity a Problem?

FPS map design

1993

2010

[Image attribution unknown]
But Actually…

[refugeinaudacity.wordpress.com]
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Learning How to Play

• Mechanics are (often) new and unfamiliar
  • Players have to learn how to interact with them
  • Aside: why innovation is not always popular

• Players could learn by reading the manual
  • This is boring! Let me play already

• Tutorial levels allow the player to…
  • Get started playing immediately
  • Learn the mechanics while playing
Classic Approach: Restrict the Player

- Start with your **gameplay specification**
  - Remove all but the barest mechanics
  - Remove verbs by disabling controls
  - Remove interactions by omitting "board elements"

- Levels add new mechanics back one at a time
  - **Example**: Platformer with a "no-jump" level

- Do not need to add a new mechanic each level
  - "Deep" mechanics allow many levels per mechanic
  - This can influence game geography (e.g. worlds)
Example: Starcraft Campaign
Explicit Restrictions

- Mechanics are unavailable for current level
  - Controls for actions are explicitly disabled
  - Interactions disabled, even if elements present

- Motivation: Prevents player confusion
  - Do not waste time on useless mechanics
  - Key in the casual and young audience

- Examples: Many AAA commercial games
  - *Starcraft* single-player campaign
  - *Portal* (integrated into story)
Implicit Restrictions

- Mechanics are always available, but not needed
  - Challenges designed for an explicit mechanic
  - Other mechanics may succeed, but they are harder
  - Level has hints to guide player to right mechanic

- **Motivation**: Allow replay in tutorial levels
  - Players go back and try optional approaches
  - Achievements are structured to encourage this

- **Example**: Many amateur Flash games
  - *My First Quantum Translocator*
The Tyranny of Choice

- Too much choice can make us unhappy
  - We are often paralyzed by what to do
  - Studied by Myers & Lane; popularized by Barry Schwartz

- But games are about *meaningful choice*
  - Problem is when choices are too similar
  - Good choices must be *significantly* different
  - **Example**: Dagger adds +1 bonus to a stat of 102

- Players use rough heuristics for making choices
  - Pattern match current situation to determine action
Portal 2 Mechanics

Level Design
New Mechanics

Recombination
Reinforcement

How long to “dwell” on mechanic before a new one?

**Actions:**
- A = jump
- B = dash

A  B  
vs.  
A A A A B
Recombination

How often to combine with other mechanics

**Actions:**

- \( A = \text{jump} \)
- \( B = \text{dash} \)
- \( C = \text{shoot fireball} \)

\[ \text{A B C vs. A AB ABC} \]
Reinforcement vs. Recombination

Reinforcement

Recombination

A A A B B B B
A A B B B AB AB
A A B C D E
A AB ABC
ABCD ABCDE
Robot Unicorn Attack
Robot Unicorn Attack Progression

Mechanics:

\[ A = \text{jump} \quad B = \text{dash} \]

A A A B A A B A A A B

High reinforcement, low recombination
Hello Worlds

Mechanics:
A = move  B = two worlds  C = close world

A  AB  AB  ABC  ABC

Moderate reinforcement, high recombination
Starcraft
Starcraft

Low reinforcement, high recombination
Next Time...

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