Lecture 25

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 the *game geography*
  - 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
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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
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 successful
  - 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**

- **Tricky Jump**
  - Start
  - End

**Stealth Game**

- **Start**
  - End
  - Avoid Detection
Design Pattern Examples

Shooter/Action Game

- Kill Enemies
- Cover
- Cover
- Cover

Racing Game

- Gain Speed
- Brake
Dash: Basic Design Patterns

1. 

2. 

3. 

4. 

Level Design
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

Racing Game

Cover

Cover

Cover

Cover Busters

GRENADE!

Cover

Cover

Restrict Positions
Is Linearity a Problem?

[Image attribution unknown]  

FPS map design

1993  

2010
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 = jump
B = dash
C = shoot fireball

A  B  C  vs.  A  AB  ABC
Reinforcement vs. Recombination

Reinforcement

A A A B B B B
A A A B B AB AB
A B C D E
A AB ABC ABCD ABCDE

Recombination
Robot Unicorn Attack

Level Design
Robot Unicorn Attack Progression

Mechanics:

A = jump  B = dash

A A A A B A A A B

High reinforcement, low recombination
Hello Worlds!
game design initiative at Cornell University

Level Design 38

A B

GAME

TIME: 0
PAR TIME: 60
SPEED TIME: 15

COINS: 0/6
STARS: 6
POINTS: 573
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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