Genre-Specific Level Design Analysis.
Upcoming deadlines

- **Friday. March 8**
  - Team status reports
  - Playtest plan due – see template on course website

- **Friday, March 15**
  - Sprint 3 ends
  - 11 full days until the end of Sprint 3
  - Will have 3 day grace until deliverables, and Sprint 3 report, which are due Monday, March 18.
Team meetings

- Not meeting today:
  - Militarium
  - Biogenesis
Lab Cleanup Schedule

- This week: Lens
- Next week: Pixture

Team duties:

- **Vacuum floor once a week** (get vacuum from facilities)
- Ensure overflowing trash cans are emptied to bin outside in 3rd floor courtyard (anytime during week)
- By 5pm Monday and 5pm Friday (unless things get out of control, then more often):
  - Pick up food containers, bottles, etc.
  - Pick up stray craft materials, pens, etc and return to drawers
  - Clean off tables in conference rooms and big circular table
  - Report any major soda/food spills to me, so we can call cleanup crews
  - Put controllers/game boxes/etc. away (tidy up game area)
  - Report any cleaning materials needed
End of quarter expectations

- There will be a final, end of the quarter presentation of your game
  - Brief presentation 2-3 minutes, then a game demo
  - Expect one of your artists to discuss art direction for 1-2 minutes
  - Not yet scheduled, will be during finals week, evening hopefully

- At the end of the quarter
  - Your game must be functional, and demonstratable
  - Code developed by various people on your team must be integrated
  - Ideal: your game should show one level that is as close to “final” as you can get
  - Includes final art, final audio, final programming, etc.
Teams seeking artists for Spring

- Provide the following to Jude Pipes (judereg@ucsc.edu)
  - Brief description of your game (URL of website, if ready)
  - Kinds of art/skills you’re interested in
  - How much time/week is required
  - Meetings per week
  - Contact information for Art Director/Coordinator
Genre-specific level design
Current State of Level Design

- Designers build levels from experience and intuition
  - A craft tradition
  - Level designers understand their craft, but have generally not written down their design principles or approach. The consequence:
    - No formal understanding of level design
    - Limited language for communication about level design

- No formal understanding of how level design creates gameplay
  - Cause-effect relationships are not widely known
Current approach for teaching level design

- Focus on creating 3D first-person camera games
  - FPS, action-adventure
  - Shallow discussion of other genres
  - Use of a specific level design tool (UnrealEd, Far Cry editor)
- Emphasis on **one-size fits all** approach to teaching level design
  - High level issues or qualities
    - Level narrative, use of puzzles (but not how to design a puzzle), pacing and flow, challenge, goal, rewards
  - Some discussion of different coarse-grain level geometries
    - Hub-and-spoke, linear, branch-and-join
Underlying assumption: principles are sufficient

- Game design is currently taught with an emphasis on teaching broad, universal principles
  - Can see this in *Rules of Play, Fundamentals of Game Design, Chris Crawford on Game Design*
  - Use principles as a lens for thinking about specific game design
  - Useful

- Level design books have a similar assumption
  - For level design, this approach breaks down.
  - Game genres are just too different!
  - Principles-based approach isn’t sufficiently detailed to provide useful guidance for level design.
Genre-Specific Level Design

- Compelling, detailed explanations of how to perform level design require analytical approaches tailored to specific game genres.
Three Examples of Genre-Specific Level Analysis

- 2D platform games
- 2D space shooters
- 3D first person shooters
- An examination of these three will show how each benefits from a genre-specific analytic approach
2D Platformers: Rhythm
2D Platformers

- Simple rules
  - Run, jump
  - Collect items
  - Get to the goal
- Complexity
  - Dexterity challenge
  - Find secret areas
  - Finish levels quickly
- Key Games
  - Super Mario World
  - Donkey Kong Country 2
  - Sonic the Hedgehog
Level Structure

- **Rhythm Groups**
  - Short, non-overlapping sections of the level
  - Encapsulate challenge

- **Cells**
  - Linear sections of gameplay
  - Contain rhythm groups

- **Portals**
  - Connect cells
  - Provide multiple paths through a level
Level Components

- **Platforms**
  - Player runs along them.

- **Obstacles**
  - Cause damage to player.

- **Collectible Items**
  - Provide reward to player.

- **Triggers**
  - Cause change in level.

- **Movement Aids**
  - Help player through the level.
Rhythm Groups: Why Rhythm?

- Foundation of challenge in dexterity games
  - Long sequences without pause
  - Long and complex patterns
  - Reduced time to complete a challenge

Source: Victor Niccollet, “Difficulty in Dexterity-Based Platform Games”, GameDev.net
Rhythm Groups

- Rhythm is that of player performing actions
- Identify challenging areas of a level
- Transitions are place where player can rest

Super Mario World, Nintendo
Cells and Portals

- **Cells**
  - Path within the game
  - Made up of rhythm groups

- **Portals**
  - Connect cells
  - Player makes a choice
Case Study

- Cells contain rhythm groups
- Portals connect cells
- Cells and portals let player choose the best path
2D Space Shooters (shmups):
Safe and unsafe space
Leading the player
Level design principles for Shmups

- Safe and unsafe spaces
  - Via walls and the location/trajectory of enemies and bullets
  - Create zones of (relative) safety and danger

- Leading the player
  - Via the placement of enemies and rewards (powerups)
  - Cause the player to move to specific places on screen
  - Can lure the player into spaces that seem safe (but won’t be by the time they arrive)
Gradius III

**Leading:** Player is attracted to powerup, wants to move there.
Gradius III

Leading: Player has gone for powerup.

Safe and unsafe: safe zone is contracting rapidly, and enemy trajectory will go through powerup
Leading: Player narrowly avoids powerup trap, moves to engage line of enemies coming in from right.

Safe and unsafe: escaping into bottom of screen safe zone
Safe & unsafe: A line of bullets slices through area in front of powerup, in case player was tempted by a quick snatch. Fast incoming enemies keep player pinned down at bottom in narrow safe zone.
Safe and unsafe: By clearing the line of enemies, the player buys a little time and safety.
Averaging Gradius Video

- 15 gameplay sessions
- Superimposed on one another, with common time base
- Each player has a different color
- View of level design as crafting a probability density function of player activity
- Credit: R. LeFeuvre
  
  http://thenewgamer.com/content/archives/averaging_gradius
First-Person Shooters: Composition of Level Design Patterns
Design Patterns

Architecture, Urban Planning
Alexander 1977

Software Engineering
Gamma et al. 1995

Game Design
Björk & Holopainen 2005
Level Design Patterns

- Recurring arrangements of elements
  - Geometry
  - NPCs
  - Items
- Can be identified in many different games
- Similar effects on player behavior
  - Changing design patterns can change gameplay
- Provide language for describing levels

Halo 3 - Bungie
Pattern Collection

- Patterns for Positional Advantage
  - Sniper location, Gallery, Choke point

- Patterns for Large-scale Combat
  - Arena, Stronghold

- Patterns for Alternate Gameplay
  - Turret, Vehicle section

- Patterns for Alternate Routes
  - Split level, Hidden area, Flanking route
Sniper Location: Halo 3
Sniper Location: Half-Life 2
Pattern Example – Sniper Location

- **Description:** A position that overlooks some other section of the level

- **Affordances:**
  - Player v. Enemy
  - Height
  - Size
  - Area overlooked
  - Cover available
  - Access

- **Consequences:**
  - Enemy: Slow movement, use cover
  - Player: Slow movement, use long range weapon