Design of computer video games

8. Level design

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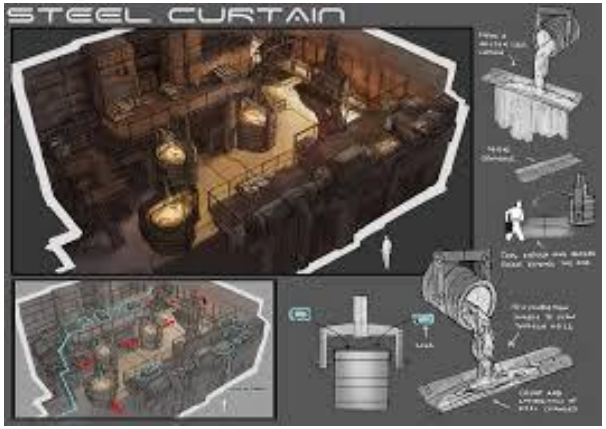
Agenda

- Introduction to game level design - definitions and basic concepts
- Universal and genre-specific level design principles
- Possible level layouts
- Importance of atmosphere, pacing, and progression
- Key aspects of the level design process
- Problems in level design
- Examples



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- Other references are cited in slides

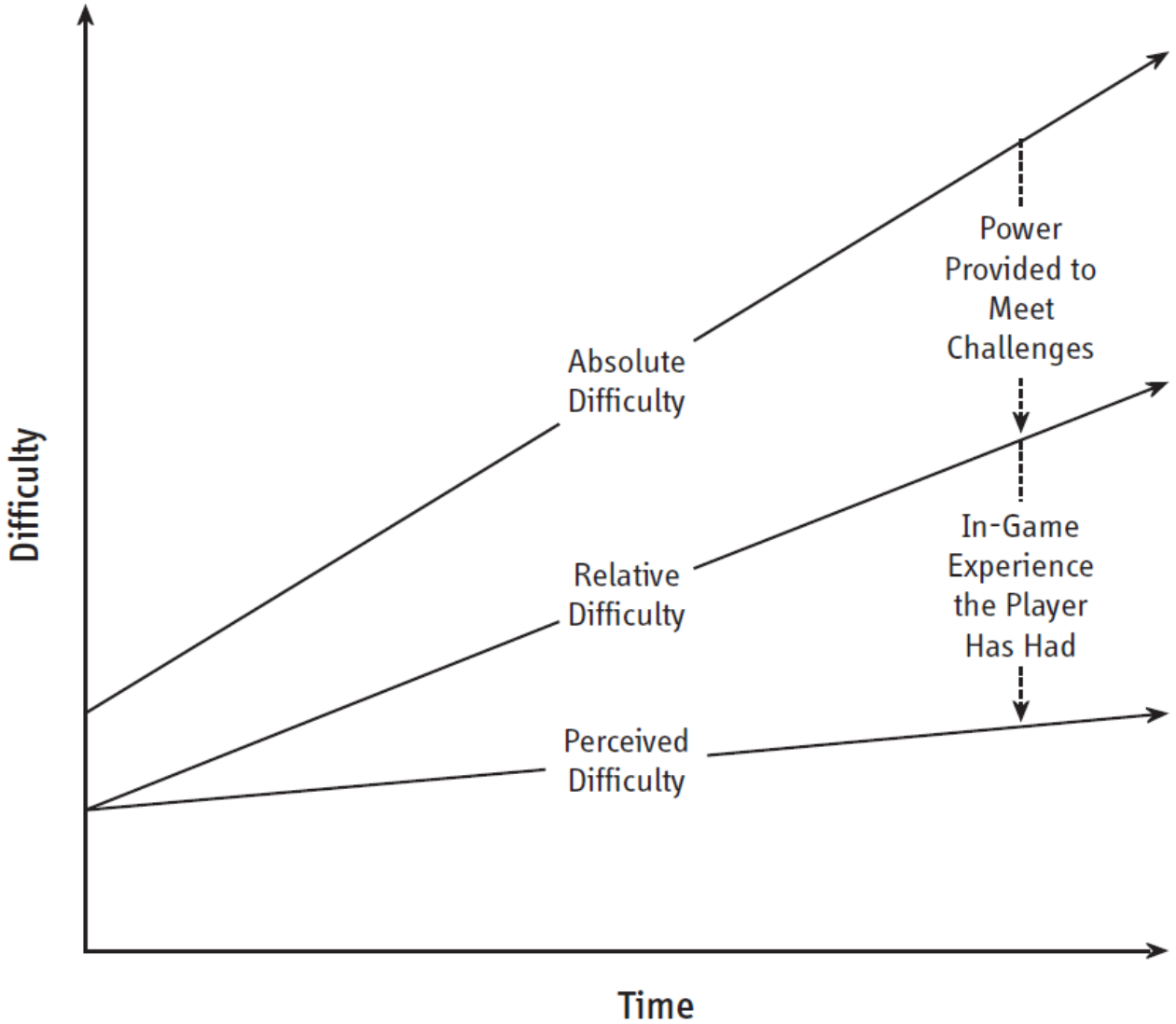
Types of difficulty

From Module 7

- ***Absolute*** *difficulty* of a challenge - the amounts of intrinsic skill required to meet the challenges and stress of the challenge *compared to the trivial case*
- ***Relative*** *difficulty* of a challenge - difficulty relative to the player's power to meet that challenge. When level designers build challenges into the game world, they must also take into account the power provided to the player to meet those challenges
- ***Perceived*** *difficulty* of a challenge - the difficulty that the player actually senses, and the type we are most concerned with - consists of the relative difficulty minus the player's experience at meeting such challenges.

From Module 7

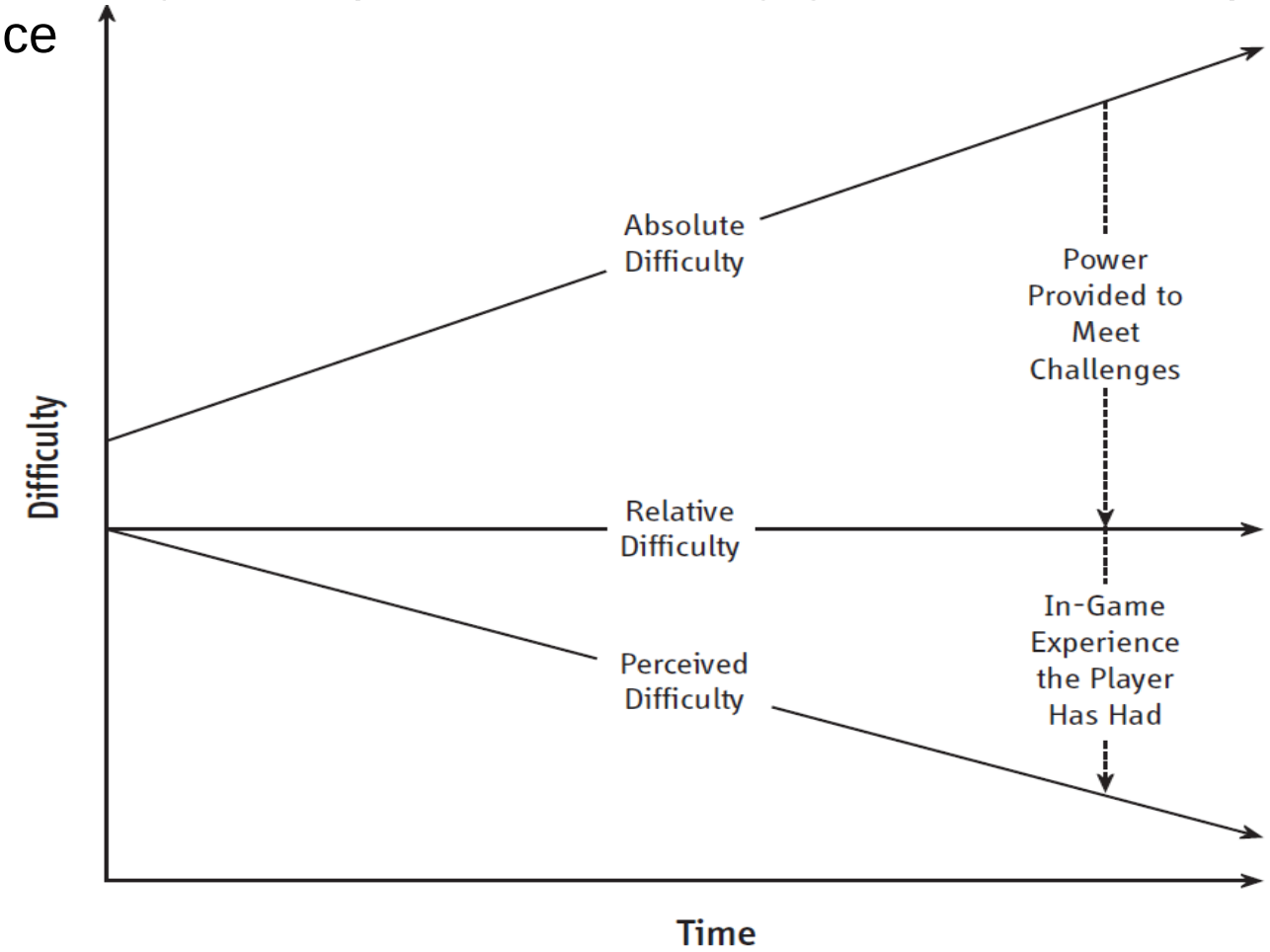
Absolute, relative, and perceived levels of difficulty



Flat relative difficulty

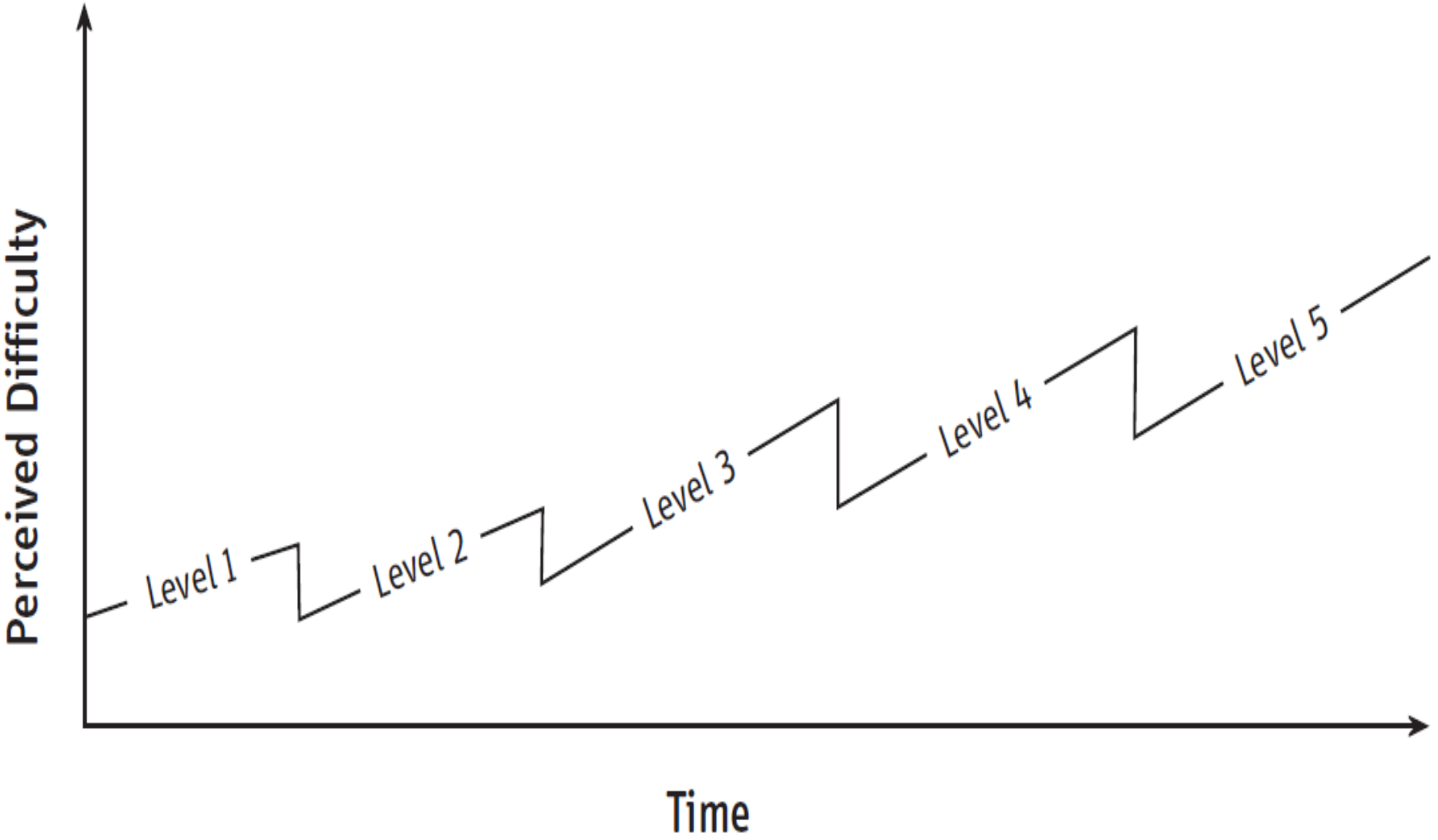
From Module 7

- If the available power grows at exactly the same rate as the absolute difficulty goes up, the relative difficulty will be a flat line
- When relative difficulty is flat, perceived difficulty goes down as the player gains experience



Perceived difficulty progression across multiple game levels

From Module 7



Level design

- Level design (LD) involves creation of video game levels including locales, maps, stages, and missions (Brathwaite and Schreiber, 2009)
- Level design is usually executed using a level editor - a game development software designed for building levels
- Level design is both an artistic and technical process (https://en.wikipedia.org/wiki/Level_design)
- Game designers dedicated especially to level design are called level designers
- Game designer ≠ Level designer

The role of level designers

Level designers create the following essential parts of the player's experience:

- The space in which the game takes place
- The initial conditions of the level, including the state of various changeable features
- The interplay between the gameplay and the game's story
- The aesthetics and mood of the level
- The set of challenges the player will face within the level
- The termination conditions of the level

Level design tools:

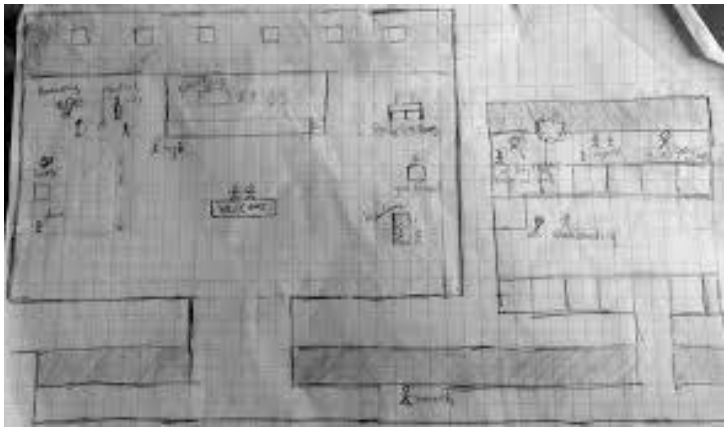
- Games like *Warcraft III* and *Half-Life 2*, actually ship their level design tools along with the game
- Players can practice level design by using those tools

Universal level design principles 1/2

- Make the early game levels to be tutorial levels (teaching the player how to play – much better than by manuals)
- Vary the pacing of the level
- When the player overcomes a challenge that consumes his resources, provide more resources
- Avoid conceptual non sequiturs (non-sense)
- Clearly inform the player of his short-term goals
- Be clear about risks, rewards, and consequences

Universal level design principles 2/2

- Reward the player for skill, imagination, intelligence, and dedication
- Reward in a large way, punish in a small way - the hope of success motivates players more than the fear of failure does
- Spend more resources (polygons, memory, CPU time) on the foreground than on the background
- The purpose of an artificial opponent is to put up a good fight and then lose
- Implement multiple difficulty settings



Discussion

What should be the level design principles specific to given game genre?

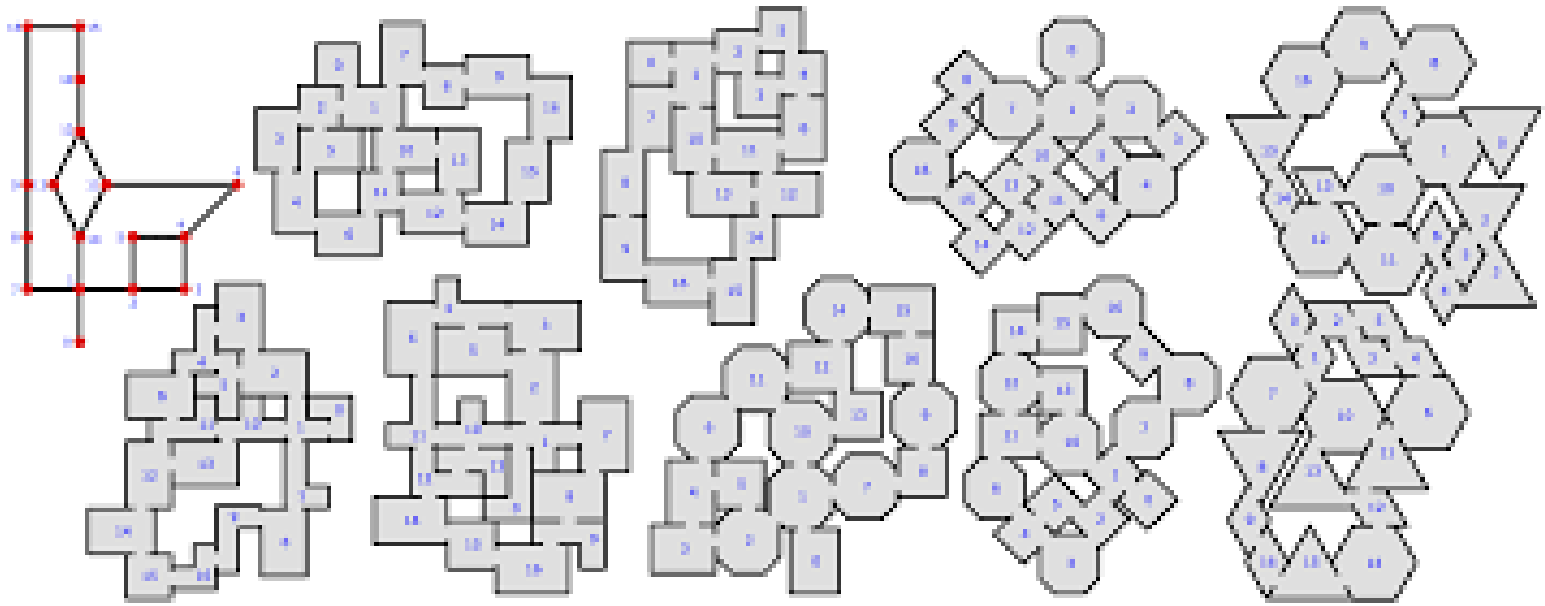
- Action game - ….
- Strategy game - …
- RPG - …
- Sports game – …
- Vehicle simulation - …
- Construction and management simulation - …
- Adventure game - …
- Artificial life game - …
- Puzzle game - …

Genre-specific level design principles

- Action game - vary the pace
- Strategy game - reward planning
- RPG - offer opportunities for character growth/self-expression
- Sports game – credibility is vital
- Vehicle simulation - reward skillful maneuvering
- Construction and management simulation - offer an interesting variety of initial conditions and goals
- Adventure game - construct challenges that harmonize with their locations and the story
- Artificial life game - create many interaction opportunities for the creatures in their environment
- Puzzle game - give the player time to think

Layouts

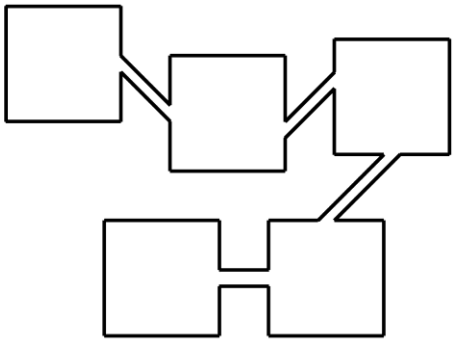
- In avatar-based games, the layout of the space significantly affects the player's perception of the experience.
- Over the years, a few common patterns have emerged, which this section introduces in simplified form



Layout types 1/4

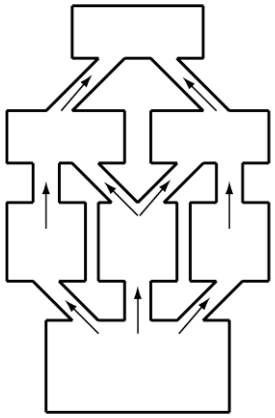
- Open layouts
  - Allow unconstrained movement
  - Correspond to the outdoors
  - Used in war games and RPG
  - Example: *Battlefield 1942*

- Linear layouts
  - Require player to move in a fixed sequence
  - Player can move only to next or previous area
  - Used traditionally in side-scrolling action games and rail-shooters

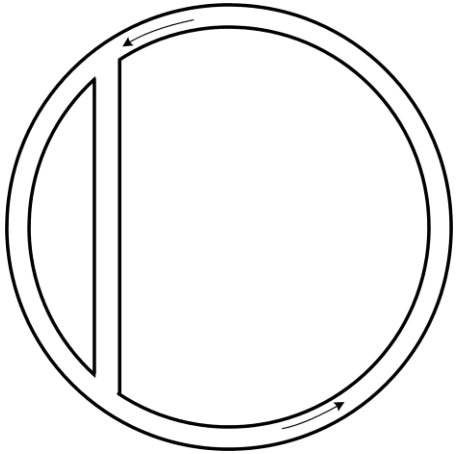


Layout types 2/4

- Parallel layouts
  - Modern variant of linear layouts
  - Variety of paths can go through the level
  - Can reflect a fold-back story structure

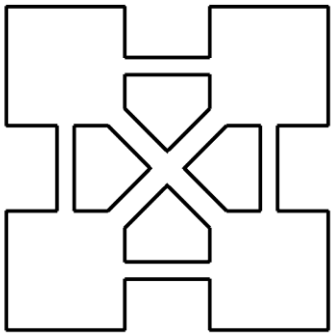


- Ring layouts
  - Path returns to its starting point
  - Oval tracks or twisting road-racing tracks are rings
  - Used for racing games

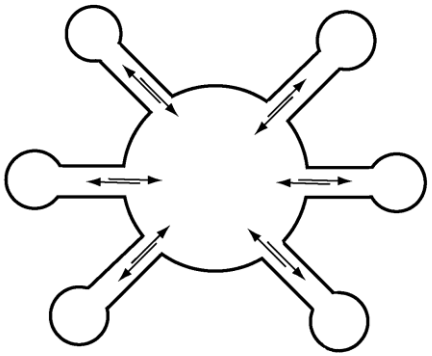


Layout types 3/4

- Network layouts
  - Spaces connect to other spaces in different ways
  - Give the player freedom to take any path
  - Stories must be able to tolerate player experiencing events in any sequence

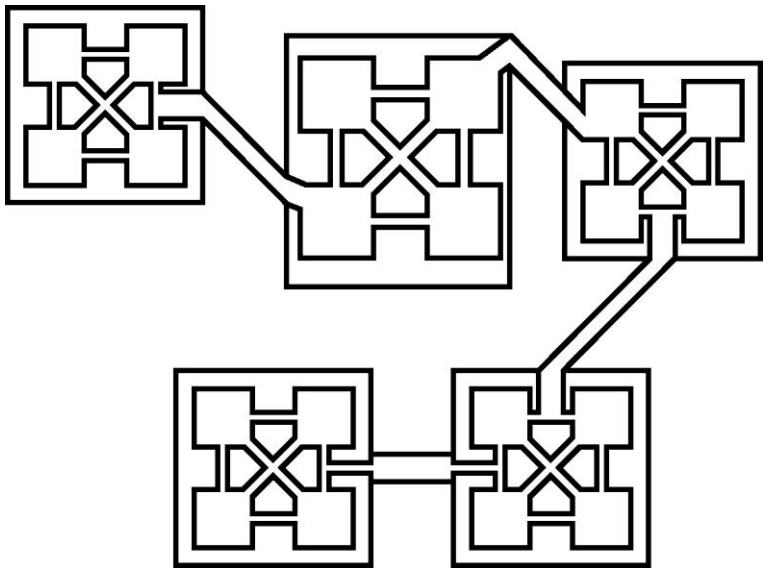


- Hub-and-spokes layouts
  - Central hub is usually a safe zone (sanctuary)
  - Provides some choice of where to go
  - Lock off some areas to control sequence a little



Layout types 4/4

- Combinations of layouts
  - Combines aspects of several layout types
  - Role-playing games and adventure games often use combination layouts



The role of atmosphere in LD

- Lighting
- Color palette
- Weather and atmospheric effects
- Special visual effects
- Music
- Ambient audio
- Special audio effects
- …

The role of progressing in LD

- Progression refers to change or growth
- In designing progression, consider these factors:

  - Mechanics
  - Experience duration
  - Auxiliary rewards and environmental progression
  - Practical gameplay rewards
  - Difficulty
  - Actions available to the player
  - Story progression
  - Character growth

Pacing

- Pacing refers to the frequency of individual challenges
  - Genre affects pacing
    - Multiplayer deathmatch shooters use the fastest pace
    - Adventure games use the slowest pace
  - Vary the pacing with fast and slow periods
  - Overall pacing should remain steady or become more rapid near the end of the level

Tutorial levels

- Tutorial levels teach the player how to play
  - Somewhat scripted experience that explains the game's user interface, challenges, and actions
    - Introduce features in an orderly sequence
    - Switch off features not yet introduced
    - If the game is complex, use more than one tutorial level
    - Highlight screen elements when you introduce them
    - Let player go back and try things again conveniently
  - Voiceover narration or text can explain the game
- Design rule: Make tutorial levels *optional*

The level design process 1/2

- Laying out the large-scale features of the map, such as hills, cities, rooms, tunnels, etc., for players and enemies to move around
- Determining environmental conditions and "ground rules" such as day/night, weather, scoring systems, allowable weapons or gameplay types, time limits, and starting resources
- Specifying certain regions where certain gameplay activities or behaviors occur, such as resource harvesting, base building, water travelling, etc.;
- Specifying non-static parts of a level, such as doors, keys and buttons with associated mechanisms, teleporters, hidden passageways, etc.;

The level design process 2/2

- Specifying locations of various entities, such as player units, enemies, monster spawn points, ladders, coins, resource nodes, weapons, save points, etc.;
- Specifying the start and exit locations for one or more players;
- Adding aesthetic details such as level-specific graphic textures, sounds, animation, lighting and music;
- Introducing scripted event locations, where certain actions by the player can trigger specified changes;
- Placing pathfinding nodes that non-player characters take as they walk around, the actions they will take in response to specific triggers, and any dialog they might have with the player.

Pitfalls of LD 1/2

- Get the scope right
  - Design within your available resources
  - It's common to design something that's too big
- Avoid conceptual non sequiturs
  - Illogical events in a game make it harder to play
  - Players should be rewarded, not punished, for using their intelligence
- Make atypical levels optional
  - Atypical levels break the player's suspension of disbelief
  - Atypical levels could prevent some players from completing the game

Pitfalls of LD 2/2

- Don't show the player everything at once
  - Introduce new features gradually
  - Maintain the player's interest
- Never lose sight of your audience
  - Player-centric approach
  - Understand your target audience and deliver what they want
- Read "Bad Game Designer, No Twinkie!", by *Ernest Adams,* Gamasutra, *March 13, 1998,* *http://www.designersnotebook.com/Columns/005_Bad_Game_Designer_1/005_bad_game_designer_1.htm*

Conclusions

- Try to learn more and reflect on that:
  - How to describe level design
  - How to apply key design principles
  - How to create a variety of layouts
  - How to create atmosphere, set a pace, and build tutorial levels
  - How to complete the level design process
  - How to avoid common pitfalls of level design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