IMGD 1001:
Gameplay

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Outline

- Gameplay (next)
- Game Balance
- Level Design

Gameplay

- Player experiences during the interaction with game systems
- Collective strategies to reach end points (score, goal)
- Specific to game activities
- "What the player does"
- Includes
  - ***Utility*** - A measure of desire associated with an outcome
  - ***Payoffs*** - The utility value for a given outcome
  - ***Preference*** - The bias of players towards utility

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Gameplay Example (1 of 2)

- Adventure game: *Knight* and *Priest*
- During combat
  - Knight in front with sword
  - Priest in back casts spells (all spells cost the same)
    - E-bolts (do damage equal to sword)
    - Band-aids (heal equal to sword)
- Fight a single opponent with sword
- Which spell should Priest cast?
  - Against 1 big opponent with 6 arms?
    - e-bolts
  - Against 30 small opponents with weak attacks?
    - band-aids
  - → Can always decide which is better (not interesting!)
- → How can we fix this?

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Group Exercise

- Break into project groups
- Adventure game: ***Knight*** and ***Priest***
- Add gameplay elements that make *combat* more interesting than in previous choice

- Discuss
- What are the categories?

Gameplay Example (2 of 2)

- Now, suppose…
  - Band-aids still affect single target but e-bolts have an area affect
  - E-bolts do less damage, but armor doesn't make a difference
- Now, which spell should Priest cast?
  - Answer isn't as easy. Interesting choices. Good gameplay.

> "A game is a series of interesting choices."
> - Sid Meier (*Pirates*, *Civilization*…)

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Implementing Gameplay (1 of 2)

- Choices must be non-trivial, with *upside* and *downside*
  - If only upside, AI should take care of it
  - If only downside, no-one will ever use it
- Note, this is only regarding Game Theory
  - Ex: Could have ray gun that plays music. "Cool", but soon "gimme the BFG"
  - Ex: Nintendo's *Smash Bro's* has "Taunt"
    - What for?
  - Other examples from popular games?
- Gameplay value when upside and downside *and* payoff depends upon other factors
  - Ex: Rohan horsemen, but what if other player recruits pikemen?
  - Ex: Bazooka, but what if other player gets out of tank?

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Implementing Gameplay (2 of 2)

- Should be *series* of interesting choices
  - Use of health potion now may depend upon whether have net for capturing more fairies
  - Having net may depend upon whether needed space for more arrows for bow
  - Needing arrows may depend upon whether killed all flying zombie bats yet
- Hence, well designed game should require *strategy*
  - Note, even *Tetris* and *PacMan* have strategy!
- Game must display *complexity*
  - But doesn't mean it must be complex!
    - Don't make too many rules ("less is more")
    - How many rules does chess have?
  - *Emergence* from interaction of rules
    - Ex: In *Populous*, Priests convert, but not if already in combat. By design? Maybe, but non-intuitive result.

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

IMGD Game Design Courses

- IMGD 1000: Critical Studies of IM & Games
- IMGD 1002: Storytelling in IM & Games
- IMGD 2500: Design of Tabletop Strategy Games
- IMGD 2900: Digital Game Design I
- IMGD 302X: Digital Game Design II
- IMGD 4600: Serious Games
- IMGD 4700: Quest Logic and Level Design
- IMGD 5300: Design of Interactive Experiences

Game Design Related Courses

- EN/WR 3217: Creative Writing
- EN/WR 2210: Introduction to Professional Writing
- EN/WR 3210: Technical Writing
- RH 3211: Rhetoric of Visual Design
- RH 312X: Digital Rhetoric

Rollings and Morris

- Types of gameplay choices
  - Choices that should sometimes be used, and sometimes not
  - Choices with critical timing or context
  - Choices that make no difference
  - Choices always worth using
  - Choices never worth using

Useful Terms From Game Theory

- Tactics
- Strategy
- Transitive / non-transitive relationships
- Dominated strategy
- Dominant strategy
- Near-dominance

The Dominant Strategy Problem

- Articles with "10 killer tactics" or "ultimate weapon"
  - What are these doing?

  → Taking advantage of flaws in the game design!
- Should never have an option that is so good, it is never worth doing anything else
  - *Dominant* strategy
- Should never have an option not worth using
  - *Dominated* strategy

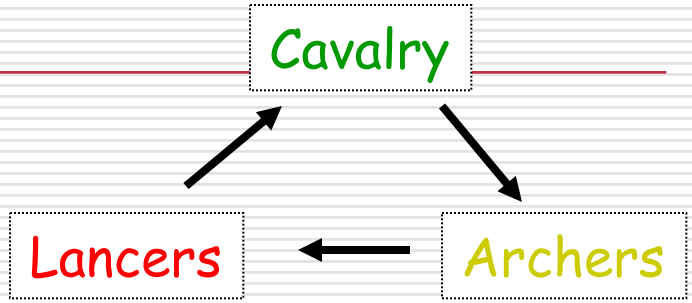
Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Near Dominance

- Worth looking for near dominance, too
  - *Near-dominated* – useful in only very narrow circumstance
  - *Near-dominant* – used most of the time
- Ex: *stun gun* only useful against raptors, so only useful on raptor level (near dominated)
  - Do I want it used more often?
  - How much effort on this feature?
  - Should I put in lots of special effects?
- Ex: *flurry of blows* most useful attack (near dominant) by Monk in D&D
  - Should we spend extra time for effects?

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Avoid Trivial Choices



- Cavalry → Archers → Lancers
  - *Transitive,* not so interesting
- Better (see right)
  - Cavalry fast, get to archers quickly with lances
  - Lancers spears hurt cavalry bad
  - Lancers slow, so archers wail on them from afar
- What game does this look like?
  - rock-paper-scissors

→ *Intransitive*, more interesting

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Toolbox of Interesting Choices

- Strategic versus Tactical
- Supporting Investments
- Compensating Factors
  - Impermanence
- Shadow Costs
- Synergies

Strategic versus Tactical (1 of 2)

- Strategic choices affect course of game over medium or long term
  - *Tactical* choices apply right *now*
  - Ex: build archers or swordsmen (strategic)
  - Ex: send archers or swordsmen to defend against invading force (tactical)
- Strategic choices have effect on tactical choices later
  - Ex: if don't build archers, can't use tactically later

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Strategic versus Tactical (2 of 2)

- Ex: *StarCraft*
  - Strategic choice: 1) upgrade range of marines, 2) upgrade damage, or 3) research faster fire
  - Which to choose?
    - If armored foes, Protoss Zealot, more damage
    - If fast foes, Zerglings, maybe faster fire
  - Other factors: number of marines, terrain, on offense or defense

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Supporting Investments

- Often game has primary goal (ex: beat enemy) but secondary goals (ex: build farms for resources)
- Some expenditures directly impact primary goal (ex: hire soldier), while others indirect (ex: build farm) called *supporting investments*
- Primary goals are "one-removed"
  - Ex: improve weapons, build extra barracks
- Supporting goals are "two-removed"
  - Ex: build smithy can then improve weapons
  - Ex: research construction lets you build smithy and build barracks (two and three removed)
    - Most interesting since strategic
- Payoff will depend upon what opponents do

Versatility (1 of 2)

- For balance, a guideline is to ask what is best and worst about choices:
  1) This move does most damage, but slowest
  2) This move is fastest, but makes defenseless
  3) This move best defense, but little damage
- Most should be best in some way
- With versatility, a 4th choice:
  4) This is neither best nor worst, but most versatile
- Versatile good for
  - beginners
  - flexibility (against unpredictable or expert opponent)

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Versatility (2 of 2)

- Ex: beam can mine asteroids and shoot enemies
  - Versatility makes it good choice
- Speed is common way for versatility
  - Don't make fast units best at something else
- If a versatile unit is also cheapest and most powerful → no interesting choice
  - (See "Compensating Factors", next)

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Compensating Factors

- Consider strategy game where all units are impeded by some terrain
  - Ships can't go on land, tanks can't cross water, camel riders only in dessert
- Flying unit that can go anywhere
  - How can we balance this?

  1) Make slow
  2) Make weak, easily destroyed
  3) Make low surveillance range (unrealistic)
  4) Make expensive

  Common but uninteresting since doesn't change tactical use!
- Versatility, neither best nor worst
  - good for beginners
  - Flexible, so often more powerful
  - Speed makes units versatile

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Impermanence (1 of 2)

- Some things are permanent
  - Ex: you get a health pack
- Others are not
  - Ex: I got the "one ring" but you can grab it off me
- Really, another kind of compensating factor
  - i.e., impermanence can compensate for something being really good
  - a common and valuable technique
- Can be used for interesting choices
  - Ex: choice of "medium armor for rest of level" or "invulnerable for 30 seconds"?
- Advantage (or disadvantages) can be impermanent in number of ways.
  - How?

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Impermanence (2 of 2)

- Examples (mostly from *Magic the Gathering – Battlegrounds*)
  - Can be destroyed (enchantments, ex: *gratuitous violence* makes units tough, but can be destroyed)
  - Can be stolen or converted (ex: *threaten* steals or converts enemy for short time)
  - Can be applied to something you don't always have (ex: *goblin king* gives bonus to goblins, but must have goblins)
  - Certain number of uses (ex: three grenades, but grenade spamming)
  - Last for some time (wears off, ex: Mario *invulnerable star*)

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Shadow Costs (1 of 2)

- In a game, you are continually presented with cost/benefit trade-offs
- But not always directly
  - Ex: soldiers for gold, but need armory first for weapons and barracks for soldiers
  - Called *shadow costs* for supporting investments
  - And shadow costs can vary, adding subtlety

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Shadow Costs (2 of 2)

- Ex: Age of Mythology has wood and food. Food is inexhaustible, wood is finite
  - Charioteer 60 wood, 40 food and 40 seconds
    - Shadow costs vary over game
      - Early on, food and wood expensive, spawn doesn't matter (since make few)
      - Mid-game, much food and wood, spawn makes it harder to pump out new units
      - End-game, no wood, spawn is priceless
- Use variability to add subtlety to game
- Vary environment and vary shadow costs
- Ex: more trees to vary cost of wood
  - Challenge for level designer
  - Expert players will appreciate

Based on Chapter 3, *Game Architecture and Design*, by Rollings and Morris

Synergies (1 of 2)

Synergies are interaction between different elements of player's strategies (note, terms may be different than Ch 2.2)

- Positive Feedback
  - Economies of Scale – the more of one type, the better (ex: wizards draw strength from each other)
  - Economies of Scope – the more of a set, the better, or advantage of combined arms (ex: trident and net, infantry and tanks)
- Negative Feedback
  - Diseconomies of scale – first is most useful, others have less benefit (ex: diminishing returns from more peasants entering a mine since get in each other's way)
  - Diseconomies of scope – (ex: mixed troops go only as fast as slowest)

Synergies (2 of 2)

- Ideally, all go together at once, but can emphasize
  - Ex: Chess is a game of positive feedback
  - Small advantage early on, exploited to crushing advantage
- Game of negative feedback needs other ways to keep interesting
  - Ex: trench combat makes a "catch-up" factor, or get as far from base, supply grows long, game lasts a long time
  - Ex: *Super NES NBA Jam* – catch up setting as an equalizer
- Be aware of both negative and positive feedback

Group Exercise

- Break into groups
- Consider a new game
  - Player enters college during first year
  - Goal is to graduate from college
- Choose 1-2 tools from your toolbox below
  - Strategic versus Tactical
  - Supporting Investments
  - Compensating Factors
    - Impermanence
  - Shadow Costs
  - Synergies
- ***First*** choose tool, ***then*** consider gameplay to make interesting
- Discuss!