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Lindeman's Lectures: Game Design

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Today's Outline

- What is Gaming?
- What Makes a Good Game?
- How Can we Make Good Games?

What Makes a Good Game?

- "A great game is a *series* of *interesting* and *meaningful choices made by the player* in pursuit of a *clear* and *compelling goal*."
- Sid Meier

- "Natural Funativity"
 - Survival-skill training
 - Need to have player develop a set of skills with increasing levels of difficulty
 - Putting them to the test = mission, quest, level, *etc.*
 - Prize at the end (or in the middle)

Structure of Games

- Movies have linear structure
 - No choice by viewer
- Games must provide "interesting and meaningful choices"
 - Otherwise, user is not in control
- Random death is frustrating!

Convexity of Game Play

- Need to provide choices

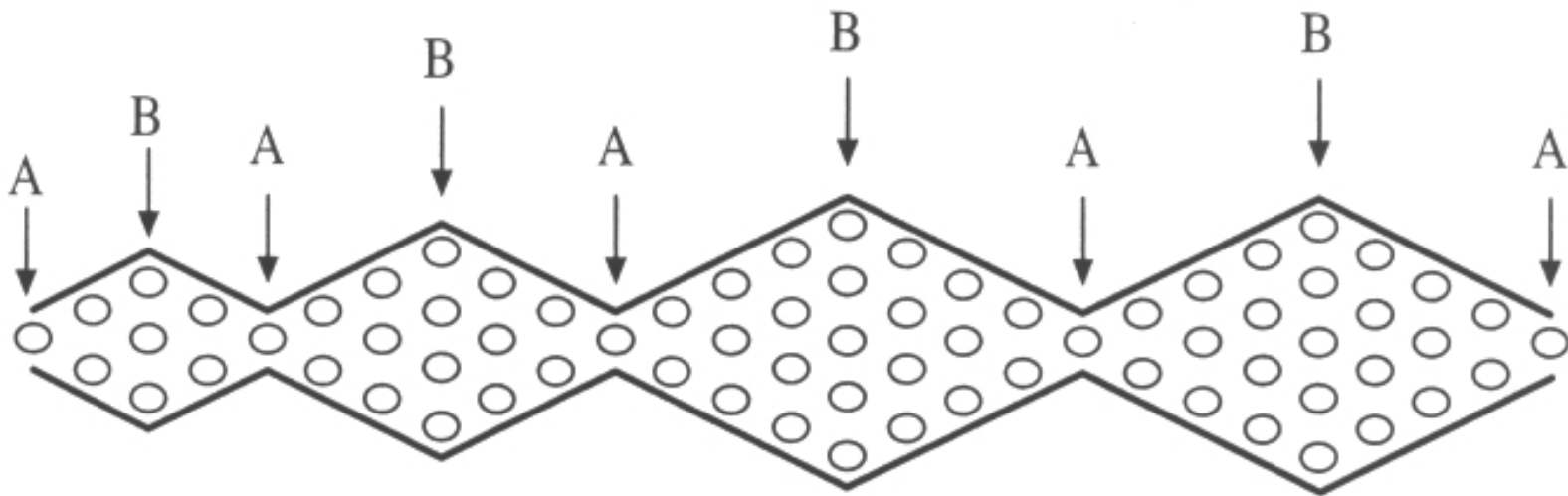
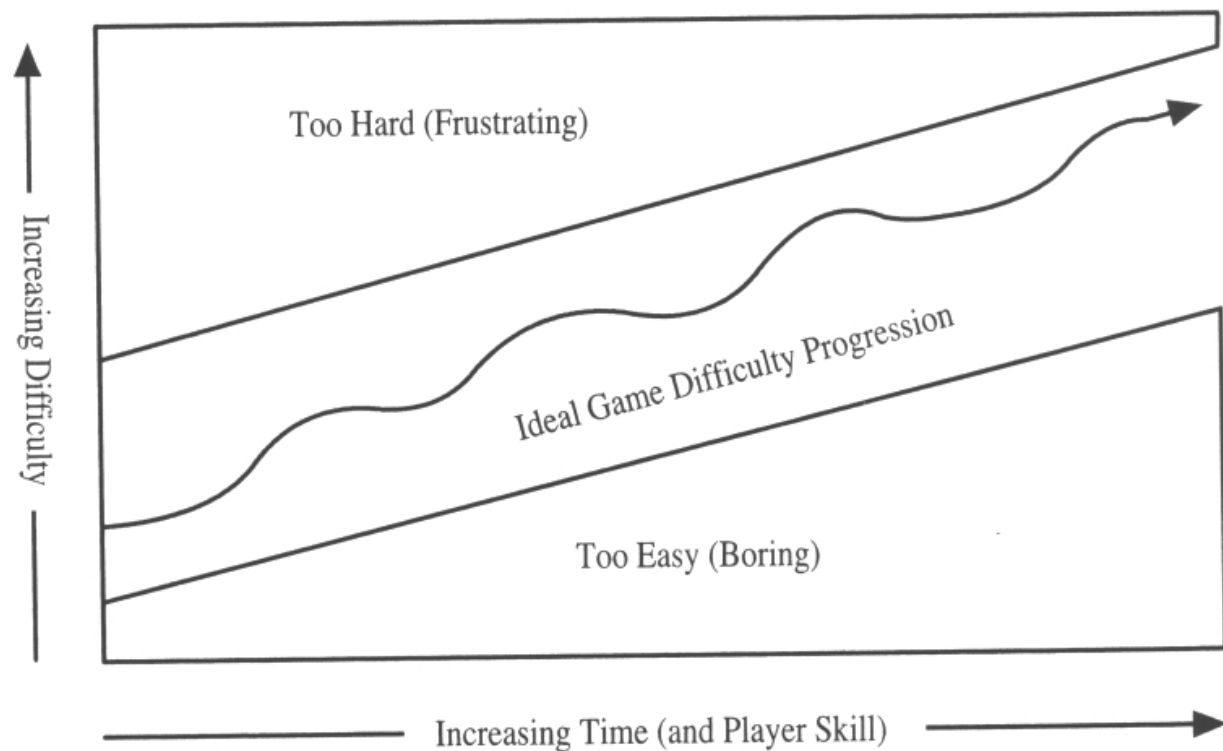


FIGURE 2.1.6 *A series of convexities.*

Flow

□ Getting the balance right is the key to success



M. Csikszentmihalyi,
"Flow, The Psychology of
Optimal Experience"

FIGURE 2.1.8 *A better flow.*

Chapter 2.1, *Introduction to Game Development*

Flow: Sample Game

- flOw
- Game written by Jenova Chen
- Research into adaptive difficulty
 - How can we keep people in flow?
 - Player doing poorly, make it easier
 - Player doing well, make it harder
- Play Demo
- <http://www.jenovachen.com/>

Convexity + Flow

- Utilizing both can lead to a great game

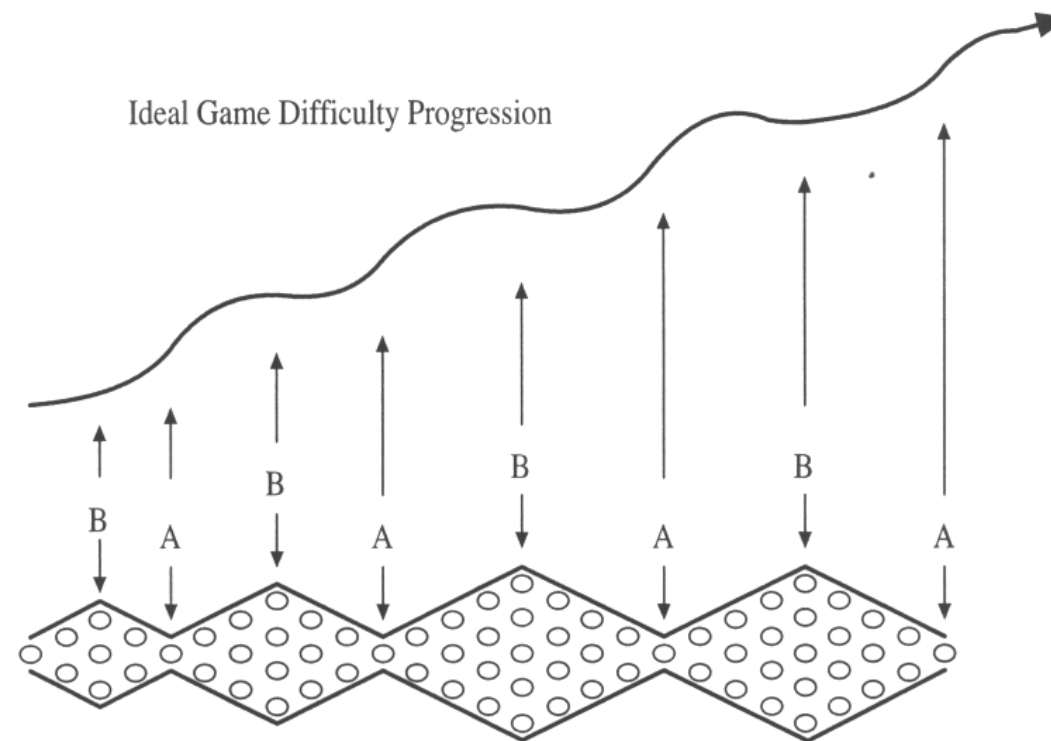


FIGURE 2.1.9 *Better flowing through convexities.*

Other Thoughts

- Theatre:
 - Show, Don't Tell

- Games
 - Do, Don't Show (== short cut scenes)

- Hal Barwood on Cut Scenes
 - Cut, edit, and cut some more until the writing is just as brief and concise as possible. At that point, the scene is probably about twice as long as it should be.

Game Balance: Introduction

- There is beauty in balanced games
 - Like Rolls Royce, or Ikea furniture
- Game without balance:
 - Often unsatisfying
 - Lots of wasted effort
 - Parts not in balance are not used
- Broadly, game balance includes:
 - **Player-Player**
 - Advantage only in skill
 - **Player-Gameplay**
 - Learning curve matched by reward
 - **Gameplay-Gameplay**
 - A composite longbow that does twice the damage, should cost twice the \$\$

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

Player/Player Balance

- Victory should be decided by *skill and judgment*
- Avoid results caused mainly by a stroke of luck
- Simplest way is to have symmetry
 - Same weapons, maneuvers, hit points
 - But note:
 - Not always the most interesting.
 - Want different moves on fighters.

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

Exact Symmetry

- Exact symmetry is fine in abstract games
 - Chess, basketball
- In realistic games, would be problem
 - Droid army vs. Naboo
- While it's easy to do, it's kind of an insult
 - LOTR: Battle for Middle Earth
 - Warg's same as horses...but Wargs can bite in book/movie!
- Better is *functional* symmetry that is not obvious

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

Symmetry in Level Design

- Can avoid obvious symmetry
 - Each player has impassible region in back (water, mountain range, lava)
 - Knights and soldiers can't cross
 - Later on, more advanced units can
 - Choice of unit depends upon barrier
 - Mountaineers to storm
 - Ships to cross sea

- Players can choose asymmetric start location
 - Should not be deciding factor
 - Avoid making start location critical decision

Based on Chapter 5, Game Architecture and Design, by Rollings and Morris

Symmetry in Game Design

(1 of 2)

- Make all choices for players functionally the same
 - *Warcraft 2*: Humans have griffons and Orcs have dragons
 - Both fly
 - Both strong
- But even slight differences can make things interesting
 - *Warcraft 2*: Orc player's runes explode, making use in mountain passes good
- "Just broken" asymmetry easier to manage than total asymmetry

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

Balance Outline

- Broadly, game balance includes:
 - Player-Player
 - Player-Gameplay (next)
 - Gameplay-Gameplay

Player/Gameplay Balance (1 of 4)

- Means remembering that the business is about *interactivity*
 - Think about player's relationship to the game
 - Character control should not be the goal of the game
 - Likewise, player should not struggle for small reward
- *Baldur's Gate*
 - Attributes are 3-18
 - You can re-roll if you don't like your results
 - So, re-roll until all 18s!
 - Boring! Test of endurance!

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

Player/Gameplay Balance (2 of 4)

- Player/Gameplay balance entails balancing challenges against player's improvement curve

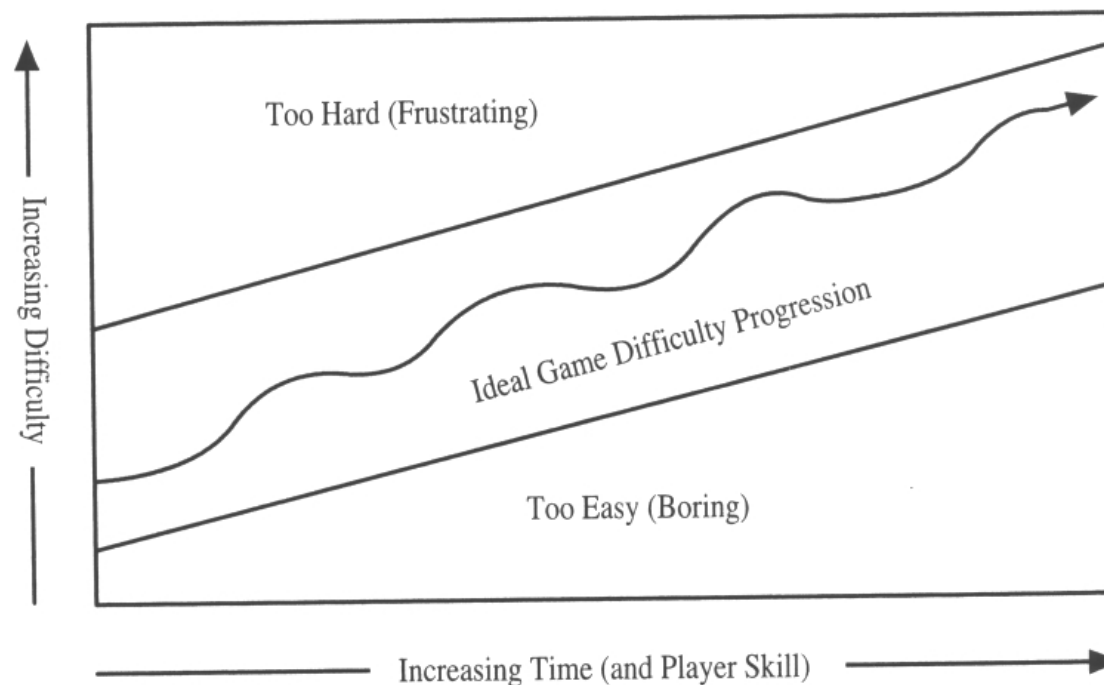


FIGURE 2.1.8 *A better flow.*

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

Player/Gameplay Balance (3 of 4)

□ Problem

- Game starts easy (most do), and stays easy too long
 - Player quits from boredom
- Game starts easy, then gets suddenly hard (added timing or new-skill requirements)
 - Player quits from frustration

□ Ideally, game difficulty adapts to skill of play (track statistics, etc.).

- Give a lot of health for new player, or a guy that gets wounded.
- Great!
 - But a *lot* of work to build and test to get it right

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

Player/Gameplay Balance (4 of 4)

- More common
 - Have difficulty settings (player manually selects)
 - Still challenge of making the "Normal" level right.
- Compromises
 - Could ask player up front some questions
 - Have you played FPS before?
 - Could have player do tutorial level, then recommend setting
- Getting more difficult
 - Many RPG's have monsters get tougher with level
 - Boring if that is all we do since game will "feel" the same
 - Want *widening options*, too
 - Character gets more abilities

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

Outline

- Broadly, game balance includes:
 - Player-Player
 - Player-Gameplay
 - Gameplay-Gameplay (next)

Gameplay/Gameplay Balance

- Consider Warcraft 2, with dozens of units. Nearly perfectly balanced.
 - No unit costs so much you don't want it
 - No unit is too weak you can do without it

- Either:
 - The developer got lucky, or
 - Lots of play testing
 - Probably the latter

- Strong Rock-Paper-Scissors relationship
 - Have to play all units, none are dispensable

Intransitive Game Mechanics

	Rock	Paper	Scissors
Rock	0	-1	+1
Paper	+1	0	-1
Scissors	-1	+1	0

- Payoff: match your choice with opponent
- Suppose I always picked rock. Then opponent would notice and pick paper. Then I would start to always pick scissors, then...
 - spiral to center of triangle where all options equal
 - only break even, like thermodynamics
- Note, too, that player must chose all in turn. No option that can do without (or opponent will exploit). It is *balanced*.

A Game-Balance Checklist (1 of 3)

□ *Player-Player*

- Ensures game is fair
- Especially important for multiplayer games
- Symmetry works for this, but asymmetry may be needed or more appealing (try "just broken")
- Make sure any asymmetry doesn't magnify imbalance as game progresses

□ *Golden rule*: a player should never be put in an unwinnable situation through no fault of their own

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

A Game-Balance Checklist (2 of 3)

□ *Player-Gameplay*

- Ensures player never becomes frustrated.
- Continually brings player back for more.
- Interface should not present obstacles.
- Small rewards are needed to guide player
 - Ex: Fancy animation or new powers
- Best rewards *widen options*

□ *Golden rule*: The game should be fun to learn as well as to play, and it should be *more* fun the more you master it

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

A Game-Balance Checklist (3 of 3)

- *Gameplay-Gameplay*
 - Ensures no element redundant or useless
 - Can do briefly by making factor table for each attribute (Ex: fire, range ...)
 - Make sure each best at something
 - RPS ensures each component dynamically best rather than statically so
 - Oblige player to alter tactics
 - Don't have to have every component equally useful
 - But cost, availability and ease of use should reflect value
 - Get right through playtesting
- *Golden rule*: all options in game must be worth using sometime, net cost of each option must be on par with payoff

Based on Chapter 5, *Game Architecture and Design*, by Rollings and Morris

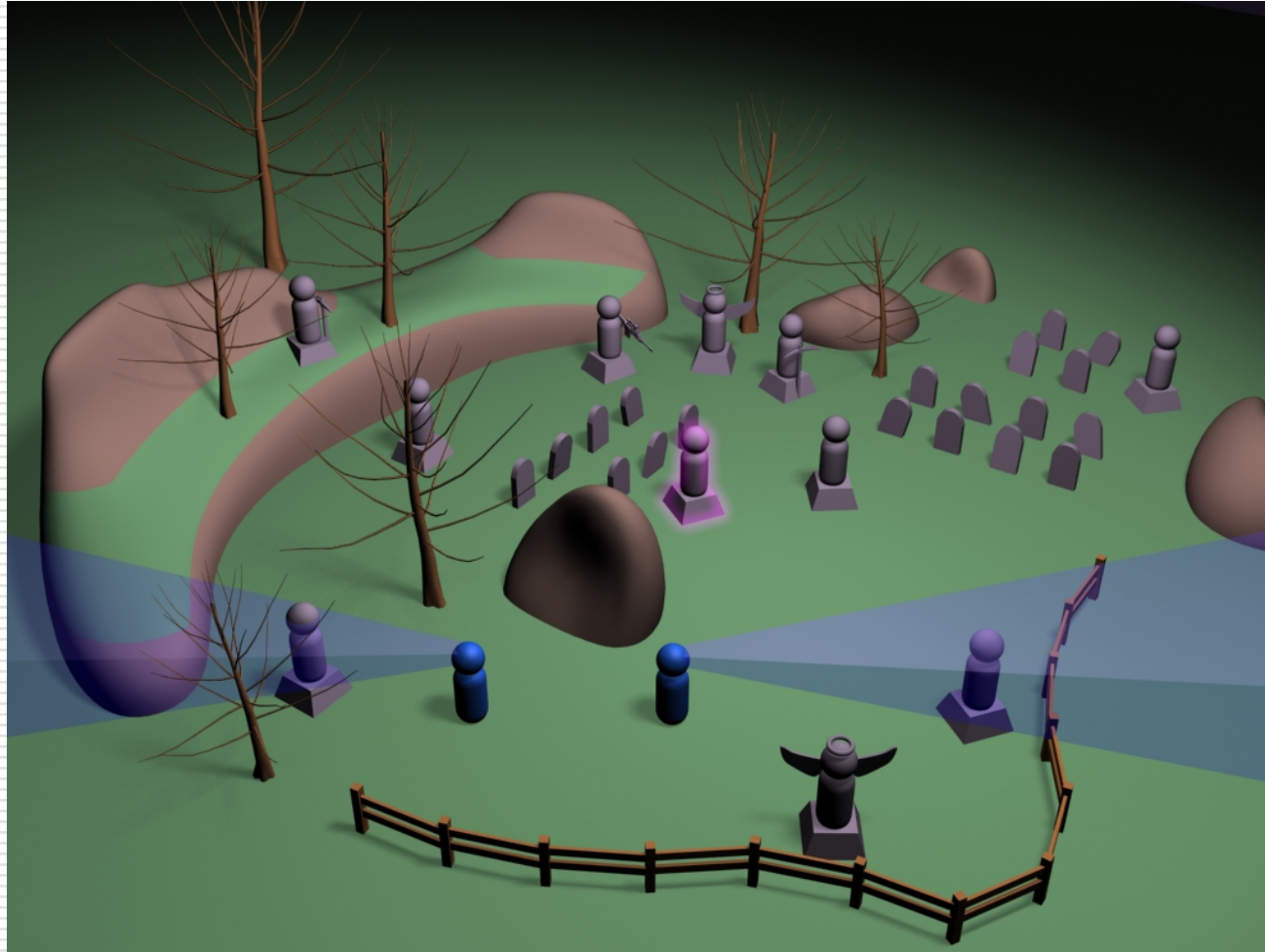
Deconstructing *Petrified*

- First-person, multi-player, team-based horror/survival game
- Two teams
 - Humans (*Mortals*):
 - People trapped in the cemetery
 - Need to survive until dawn
 - Statues (*Watchers*):
 - Tombstones
 - Need to convert Humans to Statues

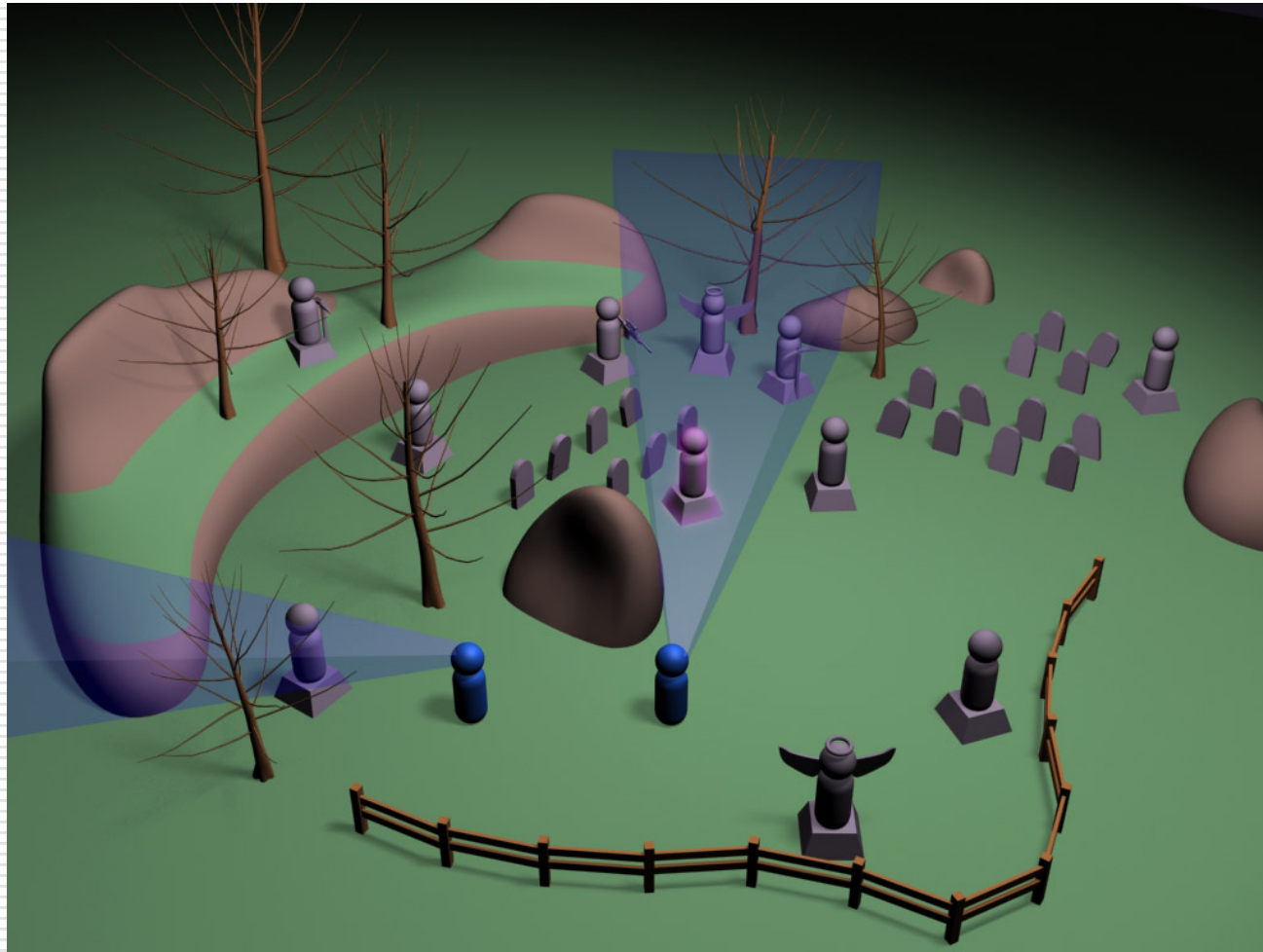
Deconstructing *Petrified* (cont.)

- Main game mechanics
 - Watchers (Statues) can
 - Move when not being looked at by Mortals
 - Occupy another unoccupied statue anytime
 - Swipe at Mortals (short-range attack)
 - Mortals (Humans) can
 - Look at Watchers
 - Move freely
 - Work together

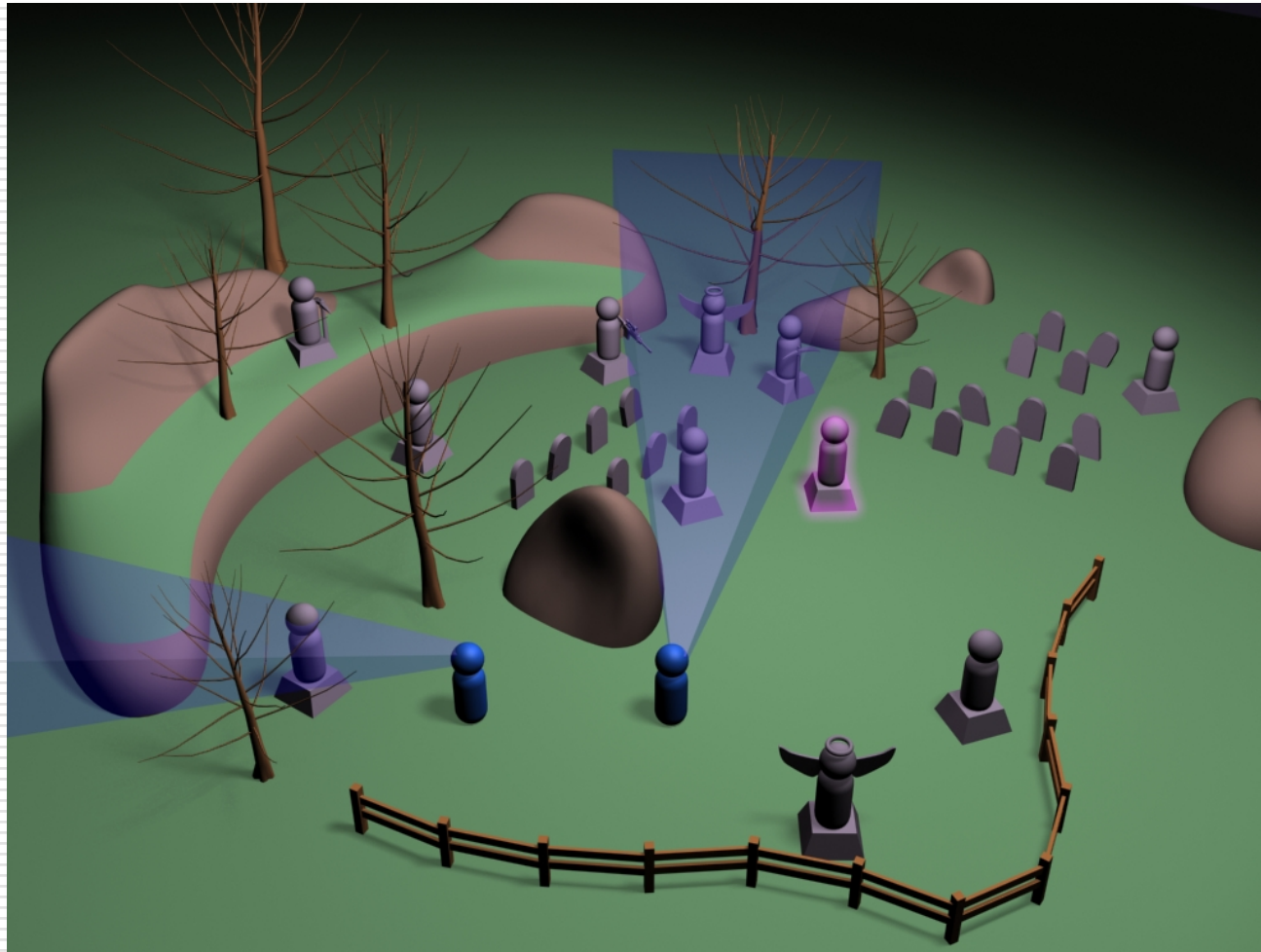
Petrified: Walkthrough (1/6)



Petrified: Walkthrough (2/6)



Petrified: Walkthrough (3/6)



Petrified: Walkthrough (4/6)



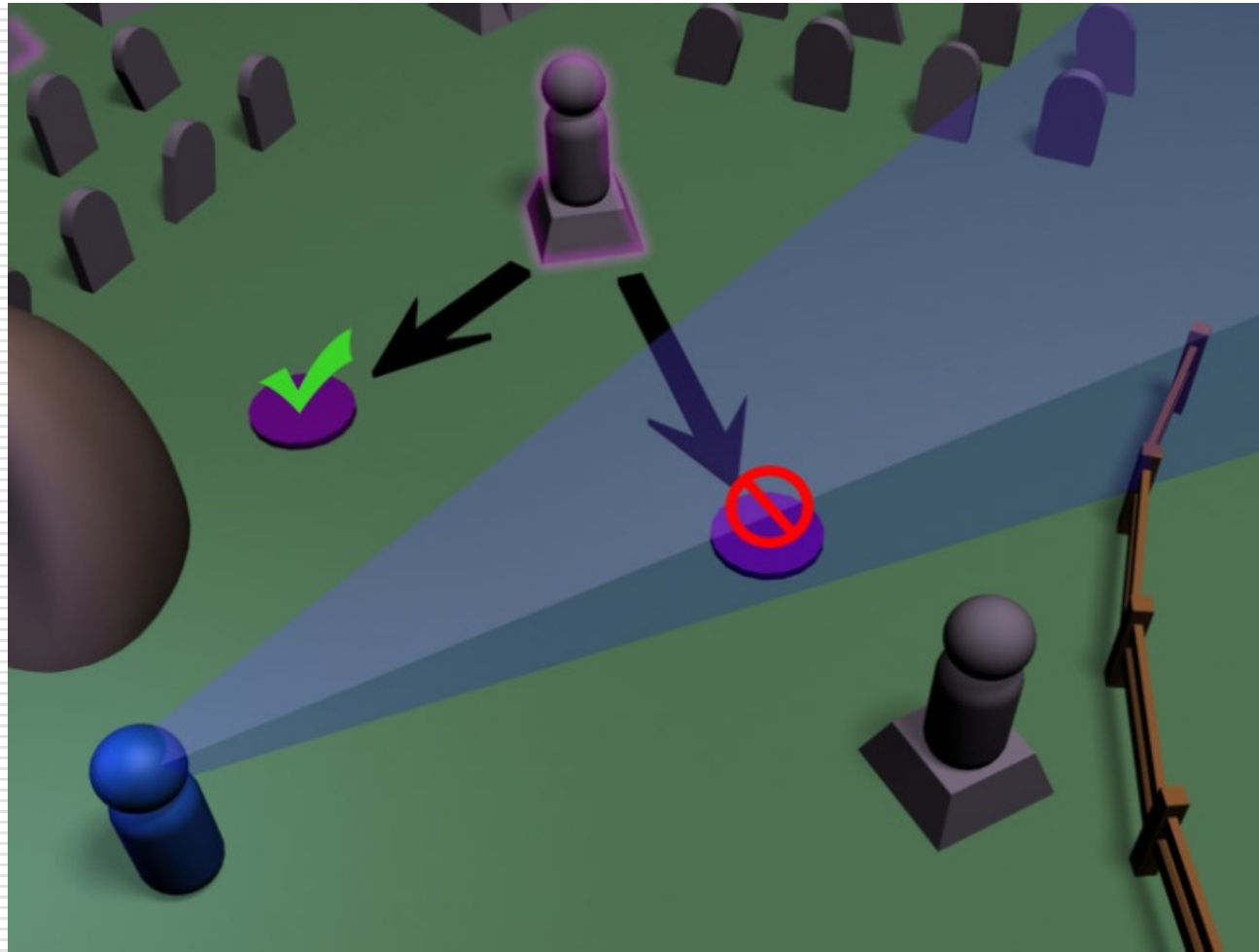
Petrified: Walkthrough (5/6)



Petrified: Walkthrough (6/6)



Petrified: Watcher Movement



Petrified: Watcher “Swapping”



Question for Discussion: Is *Petrified* Balanced?

- ❑ What type of symmetry is used?
- ❑ Does one team have an advantage?
- ❑ If you were a Mortal, how would you play?
- ❑ If you were a Watcher, how would you play?
- ❑ What improvements/changes could you make to the game?

Petrified: Flashsticks

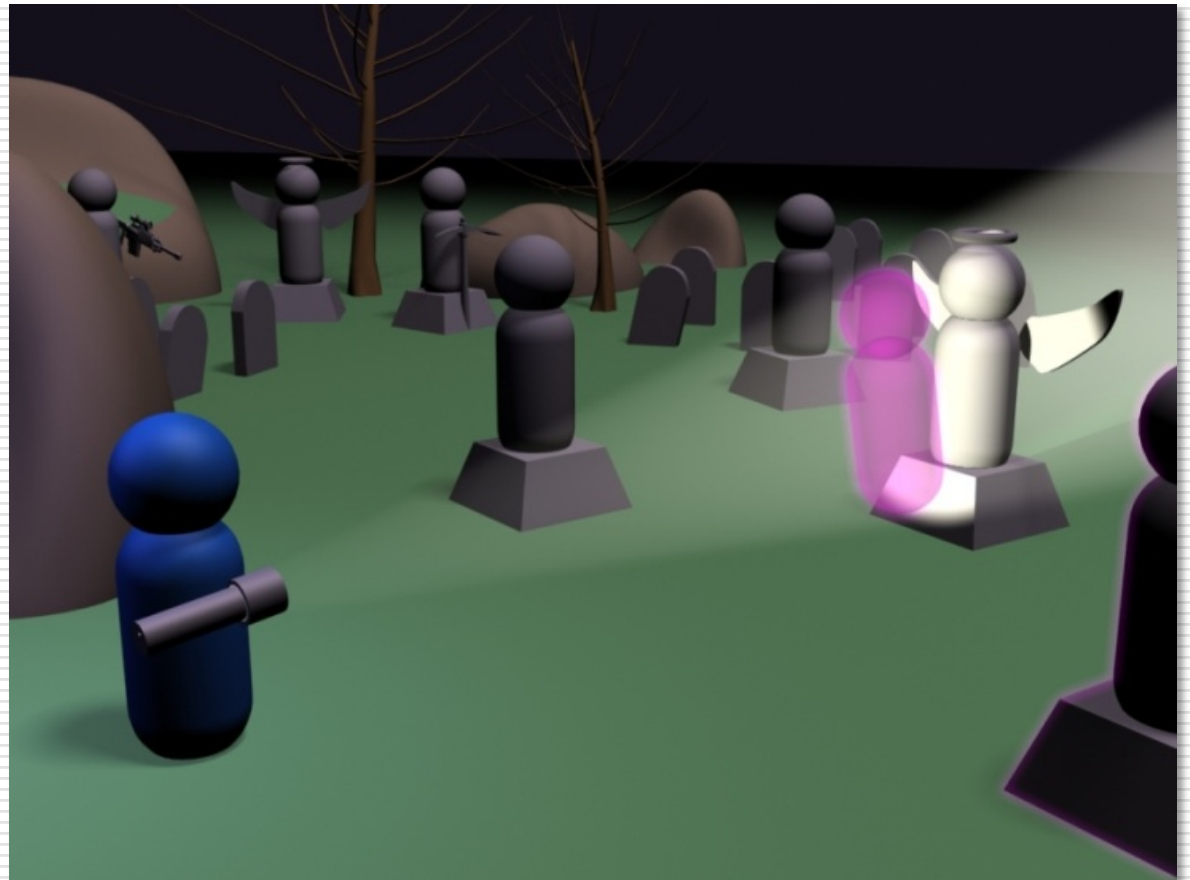
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R.W. Lindeman - WPI Dept. of Computer Science
Interactive Media & Game Development, Osaka Univ. (Summer 2013)

Petrified: Balancing the Mortals

- ❑ Flashstick compensates for weak Mortals
- ❑ Skilled Mortal can survive forever



Petrified:

Balancing the Watchers

- Range Attack Balances Watchers
 - Mortals cannot “camp out”
- Provides incentive for Watchers to move about/chase Mortals
- (Show Clip)