

# Computer Game Design

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# Kinds of Games

1. Adventure
2. Role playing
3. Sports
4. Card games
5. Arcade games
6. Flight simulators
7. 3d games
8. Children's games

# Platforms

1. Computer – Windows/Direct-x  
(Mac or pc)
2. Video games – console games
3. Mobile Games (phones and tablets)
4. Multi-player games
  - a. Peer to peer – modem
  - b. Pc network
  - c. Client server

# Languages

1. Assembly
2. C
3. C++
4. C#
5. Java
6. Flash
7. html5

# Tools

1. Sound digitizer
2. Music editor or sequencer
3. Graphics tools like photo shop
4. Video digitizer
5. Video camera's
6. Graphics library
7. Game engines

# Trends

1. 3D technology
  - Motion capture
2. Virtual reality
  - Improve interaction devices
3. Really good AI
  - Allow games to react to users dynamically
  - Build really good opponents

# Trends

4. Specialized play hardware
  - 3D accelerator cards
  - Wave audio
  - Force feedback devices
5. Web games (interactive)
6. Mobile games
7. Mixed reality games

The next 25 slides come from Gibson



# Bartok: A Game Design Exercise

- Bartok is a classic card game that is similar to the commercial game *Uno*
- All you need to play are three to five players and a standard deck of playing cards
  - Break into groups of 3-5 players each
  - Remove the Jokers from the deck
  - Shuffle the cards

# Bartok: A Game Design Exercise

- Objective
  - Be the first person to run out of cards
- Standard Rules:
  - Deal 5 cards to each player
    - The remaining cards become a draw pile
  - Flip over the top card of the draw pile to start a discard pile
  - The person to the left of the dealer plays first, and play proceeds clockwise
  - Each player must play a card onto the discard pile that matches the suit or number of the top card of the discard pile.
  - If she can't, she must draw a card.

- Example



**The player can choose to play any one of the cards highlighted with blue borders (7C, JC, 2H, 2S).**

# Bartok: Asking the Right Questions

- Analysis
  - Is the game of the appropriate difficulty?
  - Is the outcome of the game based more on strategy or chance?
  - Does the game have meaningful, interesting decisions?
  - Is the game interesting when it's not your turn?

# Bartok: Modifying the Rules

- Each group should pick a number (1 – 3)
- Based on the number, add the following rule to the game:
  - Rule 1: If a player plays a 2, the person to her left must draw two cards instead of playing.
  - Rule 2: If any player has a card that matches the number and color (red or black) of the top card, she may announce "Match card!" and play it out of turn. Play then continues with the player to the left of the one who just played the out-of-turn card. This can lead to players having their turns skipped.
  - Rule 3: A player must announce "Last card" when she has only one card left. If someone else calls it first, she must draw two cards (bringing her total number of cards to three).

## WATCH OUT FOR PLAYTESTING FLUKES

- A strange shuffle or other external force can cause one playtest of the game to be very different from others
- You must playtest several times to ensure that you experience an average playtest and not a fluke
- However, you must also note any flukes that happen because they can also happen to players

# Bartok: Asking the Right Questions

- How did the single rule change the game?
- Have the answers to your questions changed?
  - Is the game of the appropriate difficulty?
  - Is the outcome of the game based more on strategy or chance?
  - Does the game have meaningful, interesting decisions?
  - Is the game interesting when it's not your turn?
- Discuss the changes to these answers for each of the three rules
- Changing a single rule can have a drastic affect on the feel of the game!

# Bartok: Making Your Own Rules

- Now, how do you *want* the game to feel?
- Try designing a rule to make the game feel more like this specific emotion
  - Change only one rule at a time
  - Test with the new rule and see how it feels
    - You don't need to complete an entire game if the rule really doesn't feel right
  - Work with your group to make the game your own



# Bartok: Discussion

- What game feel was your team seeking?
- What rule(s) did your team create?
- How well did they work?

# The Definition of Game

- Several very smart people have tried to define *game*

"A game is the voluntary attempt to overcome unnecessary obstacles" – Bernard Suits, *The Grasshopper* (1978)

"A game is a series of interesting decisions" – Sid Meier

"A game is a closed, formal system that engages players in a structured conflict and resolves its uncertainty in an unequal outcome" – Tracy Fullerton, *Game Design Workshop* (2008)

"A game is a problem-solving activity, approached with a playful attitude" – Jesse Schell, *The Art of Game Design* (2008)

"A game is a system of rules in which agents compete by making ambiguous, endogenously meaningful decisions"  
– Keith Burgun, *Game Design Theory* (2013)

# Bernard Suits's Definition

"A game is the voluntary attempt to overcome unnecessary obstacles" – Bernard Suits, *The Grasshopper* (1978)

- Attempt to create a definition that encompassed all kinds of games
  - Sports
  - Board Games
  - Make Believe

# Bernard Suits's Definition

"A game is the voluntary attempt to overcome unnecessary obstacles" – Bernard Suits, *The Grasshopper* (1978)

- Accurate definition of game, but doesn't teaching designers how to make good games
- Referred to make believe as "open games"
  - A game with the sole goal of continuance of the game
  - However, some open games have other goals



- Passage by Jason Rohrer (2007)
  - Several possible goals:
    - Moving as far to the right as possible before dying (exploration)
    - Earning as many points as possible by finding treasure chests (achievement)
    - Finding a wife (socialization)
  - These goals are mutually exclusive
  - The game is about *experiential understanding* (goal one)
    - Players are complicit in the decisions of the character and therefore better understand the feelings of the game character
    - The first of our *designer's goals* (see Chapter 8)

# Sid Meier's Definition

"A game is a series of interesting decisions" – Sid Meier

- States very little about what the word *game* means
- But states a lot about his personal beliefs about what makes a good game

# Sid Meier's Definition

"A game is a series of interesting decisions" – Sid Meier

- What makes a decision *interesting*?
  - The player has multiple valid options from which to choose
  - Each option has both positive and negative potential consequences
  - The outcome of each option is predictable but not guaranteed
- Second designer's goal: *interesting decisions*

# Tracy Fullerton's Definition

"A game is a closed, formal system that engages players in a structured conflict and resolves its uncertainty in an unequal outcome" – Tracy Fullerton, *Game Design Workshop* (2008)

- Not only a definition of *game*, but also a list of elements that designers can modify



# Tracy Fullerton's Definition

"A game is a closed, formal system that engages players in a structured conflict and resolves its uncertainty in an unequal outcome" – Tracy Fullerton, *Game Design Workshop* (2008)

- Formal elements: The elements that differentiate a game from other types of media
- Dynamic systems: Methods of interaction that evolve as the game is played
- Conflict structure: The ways in which players interact
- Uncertainty: The interaction between randomness, determinism, and player strategy.
- Unequal outcome: How does the game end? Do players win, lose, or something else?

# Jesse Schell's Definition

"A game is a problem-solving activity, approached with a playful attitude" – Jesse Schell, *The Art of Game Design* (2008)

- Like Suits, it is the playful attitude of the player that defines a game
  - Two runners are in a race
  - One is running a normal race
  - The other is aware that there is a bomb at the finish line that she must defuse
  - Only one of the two is playing a game!

# Jesse Schell's Definition

"A game is a problem-solving activity, approached with a playful attitude" – Jesse Schell, *The Art of Game Design* (2008)

- Third designer's goal: *lusory attitude*
  - From the Latin word for play, training, & sport: Ludus
  - Games should encourage the lusory attitude of players

# Keith Burgun's Definition

"A game is a system of rules in which agents compete by making ambiguous, endogenously meaningful decisions"  
– Keith Burgun, *Game Design Theory* (2013)

- **Specific terms:**
  - Ambiguous: predictable but uncertain
  - Endogenously Meaningful: meaningful in the game system

# Keith Burgun's Definition

"A game is a system of rules in which agents compete by making ambiguous, endogenously meaningful decisions"  
– Keith Burgun, *Game Design Theory* (2013)

- Intentionally limited
  - Much more restricted definition than Suits or Schell
  - Omits play activities like make believe and competitions of skill (including sports)
- Burgun attempts to restrict the definition to make it easier to understand the bounds of the field

# The Nebulous Nature of Definitions

- Suits's book was a response to Philosophical Investigations by Ludvig Wittgenstein (1953)
  - Proposed that there could be no true definition of *game*
  - Rather than a definition, games shared a *family resemblance*
- Mary Midgley also disputed this in her paper "The Game Game" (1974)

"Something can be accepted as a chair provided it is properly made for sitting on, whether it consists of a plastic balloon, a large blob of foam, or a basket slung from the ceiling. Provided you understand the need you can see whether it has the right characteristics, and aptness for that need is what chairs have in common" – Mary Midgley, "The Game Game" (1978)

# The Nebulous Nature of Definitions

- However, Wittgenstein did have a very important point:
  - Definitions change!
  - To each person, the word *game* can have different meaning
  - When you say you "want to play a game," do you mean:
    - A console game?
    - A board game?
    - A word game?
    - A casual game?

# The Nebulous Nature of Definitions

- Words also constantly evolve
  - The meaning of game has changed drastically over the last 50 years
  - Designers are constantly expanding what game means
  - The IndieCade independent game festival will accept and consider anything that the designers want to call a game



# Why Are Definitions Important?

- Definitions help you understand what people expect
  - Especially true if you're working in a specific genre or for a specific audience.
  - Understanding how your audience defines the term will help you to craft better games for them.
- Definitions can lead you to understand not only the core of the defined concept but also the periphery.
  - Games that fit the definition perfectly, and those on the edge
  - The peripheries are where new genres can be created