Digital Game Design

Why study game design in CS?
• It's fun and interesting.
• Might be in a one-person company or project
• Be able to speak the same language as the designers
• Be able to evaluate, contribute, advise
• Research
• Where else?

Recommended book
Fundamentals of Game Design
by Ernest Adams and Andrew Rollings
published by Prentice Hall

Some of the materials in these slides come from this book.

What is a game?
What's the difference between . . . ?
• Toys
• Puzzles
• Games
What is a game?

What's the difference between . . . ?
- Toys
  Just play, no rules or goal
- Puzzles
  A goal, but usually no rules (e.g. Rubik’s cube)
- Games
  Play, goal, rules

Play

Participatory form of entertainment
- Compare to books, theater, film, which are not interactive.
  Pretending – the Magic Circle
- Important even in a physical game like soccer. Why?
  The magic circle comes into existence when players join the game and agree to abide by the rules.

Goal

- Also called the object of the game
- Might or not be achievable
  - Examples of games with unachievable goals?
- Defined by the rules, is arbitrary
- Must be nontrivial and present a challenge
- Victory conditions
  - Game does not always end when victory conditions are achieved
  - Can specify loss conditions also (or instead)

Rules

Definitions and instructions that players agree to accept
- Semiotics -- meaning and relationships between symbols
- Gameplay -- challenges and actions
- Sequence of play
- Goals
- Termination
- Metarules -- exceptions or changes to rules
Information
Costikyan: "The interface must provide the player with relevant information. And he must have enough information to be able to make a sensible decision."

AI--It doesn't matter how smart your AI is if the player doesn't know what the AI is doing.

How do you give information to the player?

Giving information
Writing: Show, don't tell.

Game design: Do, don't show.

Clues--partial information

Other things that strengthen games
- Diplomacy
- Color
- Simulation
- Variety of encounter
- Position identification
- Roleplaying
- Socializing
- Narrative tension

What is Game Design?
What is a game?
1. A set of interconnected elements for structuring play
2. An event where one or more players interact with a play structuring system

What is a game element?
- Anything that is "found in most (but not necessarily all) games, readily associated with games and found to play a significant role in gameplay"

Game design involves creating a system of game elements to facilitate interaction
# Game Element Classes

## Artifacts
- Artificial objects and systems used to structure play

## Players
- Human or non-human agents who use game artifacts to structure play

## Experience
- Elements that emerge from player-artifact interaction

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# Artifact Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game mechanics</td>
<td>Elements used by game developers to challenge players</td>
<td>Quest, combo, puzzle, timer, skill, randomness, level, loot drop</td>
</tr>
<tr>
<td>Narrative mechanics</td>
<td>Elements used by game developers to advance plot</td>
<td>Dialogue, comm. chatter, audio log, video log, moral choice, codex entry</td>
</tr>
<tr>
<td>Technology</td>
<td>Tangible or intangible artifacts used to deliver game elements or play the game</td>
<td>Gamepad, mouse, keyboard, tablet, smart phone, game engine, programming language</td>
</tr>
<tr>
<td>Embedded narratives</td>
<td>Stories told by the developers to players through narrative and game mechanics</td>
<td>Overall story told through cut scenes, dialogue, codex entries, and game progression</td>
</tr>
</tbody>
</table>

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# Experience Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamics</td>
<td>Emergent behaviour of both the game and the player during player-game interaction</td>
<td>Twitch gameplay, strategic gameplay, grinding, difficulty, balance, immersion</td>
</tr>
<tr>
<td>Emergent narratives</td>
<td>A meaningful sequence of events that emerges during player-game interaction</td>
<td>EVO 2004 Moment # 37</td>
</tr>
</tbody>
</table>

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# Player Elements

<table>
<thead>
<tr>
<th>Element</th>
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</thead>
<tbody>
<tr>
<td>Aesthetics</td>
<td>The emotions evoked by a game</td>
<td>Challenge, competition, drama, exploration, horror, humour, fellowship</td>
</tr>
<tr>
<td>Interpreted narrative</td>
<td>A player's mental representations and interpretations of a game's intended or emergent narratives</td>
<td>Player interpretation of twist or ambiguous game endings</td>
</tr>
</tbody>
</table>
Game and Narrative Mechanics

Game mechanics challenge the player while narrative mechanics advance the plot of a game.

Not mutually exclusive – an element can be a game and a narrative mechanic.

Aesthetics

1. Sensation – game as sense-pleasure
2. Fantasy – game as make-believe
3. Narrative – game as drama
4. Challenge – game as obstacle course
5. Fellowship – game as social framework
6. Discovery – game as uncharted territory
7. Expression – game as self-discovery
8. Submission – game as pastime
9. Competition – game as dominance

A game can evoke multiple aesthetics
• Aesthetics are player specific.

Narrative Examples

<table>
<thead>
<tr>
<th>Teller</th>
<th>Audience</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer</td>
<td>Player</td>
<td>Cut scenes in <em>Metal Gear Solid</em></td>
</tr>
<tr>
<td>Developer</td>
<td>Observers</td>
<td>Destiny non-playable demo at the E3 2013 Conference</td>
</tr>
<tr>
<td>Player</td>
<td>Him or herself</td>
<td>Player develops a model of his or her hometown in <em>SimCity</em></td>
</tr>
<tr>
<td>Players</td>
<td>Players</td>
<td>Three friends cooperate to survive the night in <em>DayZ</em></td>
</tr>
<tr>
<td>Players</td>
<td>Observers</td>
<td>Undersog achieves unlikely victory in <em>Starcraft</em> tournament</td>
</tr>
</tbody>
</table>

Interconnections

Game elements are interconnected
• Within classes and between classes
Bad Game Design

Often occurs as a misalignment of game elements

Examples:
- Game mechanics and embedded narrative (ludonarrative dissonance)
- Game mechanics and emergent narrative
- Game mechanics and aesthetics
- Dynamics and aesthetics
- Game mechanics and technology

Making games fun

Adams & Rollings

- 50% Avoiding errors—bad programming, bad music and sound, bad art, bad user-interfaces, bad game design. "Basic competence will get you up to average."
- 35% Tuning and polishing—attention to detail
- 10% Imaginative variations—level design
- 4% True design innovation—the game's original idea and subsequent creative decisions
- 1% An unpredictable, unanalyzable, unnamable quality—"luck, magic, or stardust"

Implications:
- A well-tuned game with no major problems and interesting levels but no new ideas could be 95% fun.
- A novel game idea that is (very) poorly executed could be only 4% fun.

Finding the fun factor

Adams & Rollings

- Gameplay comes first—give people fun things to do
- Get a feature right or leave it out
- Design around the player
- Know your target audience
- Abstract or automate parts that aren’t fun
- Be true to your vision
- Strive for harmony, elegance, and beauty

How to become rich and famous . . .
The hierarchy of challenges
Adams & Rollings

• Complete the game
• Finish a mission
• Finish a sub-mission
• Finish an atomic challenge

• Player will usually be thinking about current atomic challenge.
• Awareness of higher-level challenges creates anticipation.

Challenges

• Victory conditions and atomic challenges are usually explicit.
• Intermediate challenges are usually implicit.
  • Players get tired of just following instructions.
• “The most interesting games offer multiple ways to win” – Adams & Rollings, p. 284
  • More than one way to accomplish intermediate challenges
  • Capture the flag (p. 284): defensive approach, aggressive approach, stealth approach

Interactive fiction

A way to try out some principles of game design with relatively little overhead.

Text game engines:

Inform  http://www.inform-fiction.org
TADS    http://www.tads.org
Adrift   http://www.adrift.org.uk