Today

- Announcements
- Midterm review lecture
Announcements
Midterm is “short answer”

- The questions will look like this:

- “Spacewar! and Super Mario Bros. are two highly influential computer games. Describe a core mechanic of (a) Spacewar! and (b) Super Mario Bros.”

- “Using the example of collision detection or another operational logic discussed in lecture, describe the two main elements of an operational logic.”
Everything is on a curve

- We are sending out grade reports to give you feedback on how you’re doing.
- The information in the grade reports doesn’t tell you your final grade.
- This is because the overall class will be curved, your three lowest quiz grades are dropped, etc.
- Quizzes hurt your final grade when (a) you don’t show up or (b) you get something wrong that many others get right.
Midterm review
What does this mean?
And *how* does this mean?
Not this
or this
It’s this

Player Experience

Game State Presentation Computational Process
How does collision detection mean?

• Visually: A ball runs into a paddle, then something happens (it bounces off). Like how meaning happens in a movie.

• Experientially: As we play, an experience unfolds. Balls keep running into paddles, from different angles, and keep bouncing off — we get a feel for how the world works.
The foundation of game meaning

- The *experience* of collision detection is only made possible by an underlying process.
- There are many specific collision detection algorithms, but all support an abstract process wedded to a communicative goal: when two virtual objects touch, something happens.
These are operational logics
Operational logics

• A communicative goal — “virtual objects can touch”
• combined with an abstract process — “when two coordinate spaces overlap, do something”
• supporting ongoing media (re)presentation and audience experience
Implemented in many ways

- When you play *Pong* on an Atari VCS, the 2D collision detection is implemented *in hardware*.

- When you build a game using XNA, the 3D collision detection is implemented *in software*.

- Obviously, implementations differ fundamentally, but the logic — that virtual objects can “touch” — is the same.
When fruit collides with a wall, this is an example of an operational logic.
Let’s talk about gameplay
• Operational logics characterize the system

• To start thinking further about gameplay, we’ll think about player *actions* or *verbs*

• Let’s look at a common action: jumping
What is *jumping*?
Jumping in checkers

- A core action of Checkers is piece movement.
- The fact that movement is turn-based is very important.
- So is the fact that pieces move in defined ways on defined spaces — diagonally on squares.
- This interacts with the jump action — being able to jump over an enemy piece to another open space beyond, capturing that piece.
Jumping in *Pitfall!*

- A core action of *Pitfall!* is character movement.
- The fact that movement is real time, along with environment/enemies, is very important.
- So is the fact that the character moves, and environment/enemies are arranged, in continuous space.
- Continuous space and time interacts with the jump action — being able to jump from any point, to any reachable point, at any time.
Jumping in *Pitfall*

- This kind of jumping more generally: moving away from a source of gravity to (try to) land on a/another (temporarily) safe spot

- The key things to understand about the Pitfall jump: How hang time compares with log movement speed, how jump distance compares with alligator head spacing

- We see the *mechanic* growing from the action
Game mechanics

• Some game genres are named in ways that hint at their core mechanics

• Can people here think of examples?

• First-person and third-person shooters

• More obscurely: jumping for platformers, finding/selecting for hidden object games
Describing mechanics

• The core mechanics of a game are what players do over and over when playing — jumping, shooting, extracting resources, moving pieces

• There are other mechanics for other things that can be done — swimming, castling

• Some designers and theorists use the term “mechanics” for everything that governs the behavior of the game system — every rule
Core mechanics of Super Mario Bros.

- Walking
- Running
- Jumping!
- ... across gaps, onto enemies, for coins, to activate surprises, to destroy blocks, to kill enemies on blocks, into pipes...
- Rules: touching an enemy (without landing on them) or falling past floor is death
Platformer genre

Precise walking, running, jumping are still core mechanics today
Limbo, Arnt Jensen, Jeppe Carlsen, et al, 2010
Limbo

- Actions: walking, jumping — also swinging, dragging, pushing (weak/ordinary jump)
- World: relatively precise jumps, deadly, but more puzzling than dexterity
- Theme: also a journey, but to what end is slowly revealed
Robot Unicorn Attack, Scott Stoddard and Adam Ford, 2010
Robot Unicorn and Limbo

- Both are about traveling through a space
- Both involve not knowing what comes next, then knowing and playing differently
- In one case we play differently by being able to “react to what hasn’t yet been revealed”
- In the other case we try different solutions to puzzling situations
- These mechanics work for these themes
Can any theme work with a platformer?
Congo Jones and the Loggers of Doom,
What’s missing?

“Rules”

“Fun”
The causal link…

“Rules” → “Play” → “Fun”

This is what sets games apart…
Games As Software

“Rules” → “Play” → “Fun”
Games As Software

- "Rules"
- Code
- "Play"
- Process
- "Fun"
- Requirements
A Design Vocabulary

Mechanics → “Play” → “Fun”

Mechanics → Process → Requirements
A Design Vocabulary

Mechanics → Dynamics → “Fun” → Requirements
A Design Vocabulary

Mechanics → Dynamics → Aesthetics
The MDA Framework

Mechanics → Dynamics → Aesthetics
Definitions

**Mechanics**: Player actions articulated with larger game / the rules and concepts that formally specify the game-as-system.

**Dynamics**: The run-time behavior of the game-as-system + players.

**Aesthetics**: The emotional responses evoked by the game dynamics.
The Designer/Player Relationship

Mechanics → Dynamics → Aesthetics
The Player’s Perspective

Mechanics → Dynamics → Aesthetics

Player
The Designer’s Perspective

Designer

Mechanics

Dynamics

Aesthetics
So what about Congo Jones?
Congo Jones and the Loggers of Doom,
Congo Jones and game themes

- Game mechanics: classic platforming
- Game’s opening message:
  1: Stop the logging.
  - No *preserving* aesthetic
  2: Help local people take action.
  - No *collaboration* aesthetic
Congo Jones and game themes

- 3: Mapping is the first step.
  - Maybe *traversal* aesthetic
  - Feels at odds with real mapping challenges — they would require different mechanics
- 4: Get mapping equipment to village
  - Platformers good for this challenge
  - Do we think about rainforest during play?
What’s needed to design something innovative?
Player centric design

- You are creating an aesthetic experience for the player – all design considerations must flow from the questions:
  - What does the player do? (mechanics)
  - What experience (dynamics) does this create for the player (aesthetics)?
- You are not your own typical player
- The player is not your opponent
Iterative design

• Rapid iteration, with something working all along the way, is a widespread design idea

• Fullerton calls the designer “an advocate for the player” — but it’s easy to lose sight of new player’s perspective

• Her approach: rapid iteration, with input from playtesters at every possible step
Playcentric design

• Start with player experience goals — aesthetics — e.g., need to trust and distrust other players (strategic), always almost out of control movement (feel), etc

• Generate ideas, formalize ideas, test ideas, evaluate results

• Eject, repeat cycle, or accept current ideas

• Brainstorming, prototyping, design, production, testing
Game innovation

• One level is mechanics innovation
  • You can change the *action*
  • You can change the larger system to which it is articulated

• Another level is theme innovation
  • Largely-familiar mechanics w/ new theme
Changing the action

- Adding a new action
- Changing how action works
- Re-defining fundamentals of the genre (platformer space)

*Portal*
Changing the system

- Familiar action in new system context is a new mechanic
- Two player to single, turn based to continuous, etc
- A way to revisit classics

*Plasma Pong*
Changing the theme

• Taking a known game system
• A new theme that matches core aesthetics
• Adjustments to rules

Disaffected!
Diner Dash and Disaffected!
Wario Ware and Dys4ia
Quake III and American McGee’s Alice
Bejeweled and Layoff
Platformer innovation
Changing the platform fundamentals

- Changing space’s connections (*Portal*)
- Changing space’s presence (*Closure*)
- Changing space’s objects (*Spelunky*)
- Changing space’s dimensions (*Fez*)
- Moving objects non-traditionally (*Snapshot*)
- Moving player character non-traditionally (*Super Meat Boy & Bit.Trip Runner*)
- Changing platformer time (*PoP & Braid*)

If you’re making a platformer, something to consider
Prototypes
Why prototyping?

• You want to experiment with ways to turn your game concept into a system

• You want to involve your full team — and make sure you’re all on the same page

• You want rapid iteration

• You want to make sure the game works before you start writing code, making art, etc — so start with most important parts and biggest risks
What kind of prototype?

- Many games have deep gameplay systems — role-playing, real-time strategy, etc — so prototype the system

- Other games have simpler systems and deeper level design — puzzle, platformer, adventure, etc — so prototype levels

- Two examples from CMPS 170
Computational prototypes
Design questions

• How will a core spatial/control mechanic feel? (Interface-in prototyping)

• Will the emergent NPC/enemy behavior be what we expect? (AI prototyping)

• Are the permutations balanced relative cost? (Unit customization testing)

• Good flow of narrative and space?

• Do the systems interact as expected? (Combos of resources, combat, other rules)

• Will the visual aesthetic be achievable and appropriate? (Design/tech border question)
What is a game?
Are these games?

- Jazz improvisation
- Tug of war
- Wii Music
- Russian roulette
- Renaissance fair
- Dungeons & Dragons
- Stock markets
- Crossword puzzles
- Slot machines
- Ring around the rosy
- Driving
- The Sims
Defining “game”

A “system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome”
— Katie Salen and Eric Zimmerman
Artificial conflict

- They are a system that participants play
- This system “maintains a boundary from so-called ‘real life’ in both time and space”
- They “embody a contest of powers” that can be cooperative or competitive for players, single- or mult-player, etc
Defined by rules with quantifiable outcome

- Rules are the structure out of which play emerges for Salen & Zimmerman, subsuming Fullerton’s objectives, procedures, and rules.
- For S&Z, a quantifiable outcome is what distinguishes a game from less formal play activities.
Defining “game”

A “rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable.”

— Jesper Juul
Well-defined rules — unambiguous

Affinity between games and computers

Game rules and world rules

Rules as software that require hardware
Variable, Quantifiable Outcome

- Not only in theory, but at this level of player skill
- Beyond discussion — a win, a score
- Making something a game — turning the creativity and grace of dance into a score for competitions
Valorization of Outcome

- Some outcomes are *better*
- Unwinnable games — but high score is *better*
- Positive outcomes are harder to reach — challenge
Player Effort

- People work — intellectually, physically
- Doesn’t work in pure chance, but people act like it does
- Reinforces attachment to outcome
Player Attached to Outcome

- Wanting to win, and not wanting to lose
- Violating this is playing wrong — spoilsport — usually
- If play among unequals (e.g., against small child) different story — but still a game for all players?
Negotiable Consequences

- There can be consequences, but not built into the game
- Poker can be for things of value, or not
- Not: stock market, traffic, russian roulette
- But their systems could be used for a game, w/o non-negotiable consequences
Game definitions

• Are often presented as “consensus” definitions based on surveys of previous game scholarship

• Can be interesting to think about, intellectually

• Can be a good source of game ideas (we’ll come back to this)

• But: consistently marginalize things that should be central. For example...
This is not a game
The Sims is not a game

• “The #1 best selling game of all time.”
  — Electronic Arts, 2004

• But The Sims doesn’t meet formal definitions. Such games “have emergent quantifiable goals but usually no single overriding outcome.”
  — Katie Salen and Eric Zimmerman

• “Open-ended simulation games such as The Sims change the classic game model by removing the goals, or more specifically, by not describing some possible outcomes as better than others.”
  — Jesper Juul
NOT GAMES

BORDERLINE CASES

GAMES

- Fixed rules
- Variable rules

- Negligible consequences
- Player effort
- ValORIZATION of outcome
- Player attachment to outcome
- Variable outcome
- Open-ended simulations
- No valorization of outcome
- No player effort
- No attachment

Traffic, Noble war
- Non-negotiable consequences

Skill-based gambling
- Pre-negotiated consequences

Chance-based gambling
- Pre-negotiated consequences
- No player effort

Pen and paper role-playing
- Flexible rules

Fixed outcome
- No attachment

Hypertext fiction
- Fixed outcome
- No attachment

Ring-a-ring o' roses
- Fixed outcome
- No attachment

Storytelling
- Fixed outcome
- No attachment
- No player effort

Conway's game of life; watching a fireplace
- No valorization of outcome
- No player effort
- No attachment

Games of pure chance
- No player effort
Agency and intention
1997 — Hamlet on the Holodeck

How do we combine what games have . . .

Janet Murray asks . . .

with fiction?
1997 — Hamlet on the Holodeck

- Good games don’t just have *activity*

- Good games don’t just have *participation*

- Good games have “the satisfying power to take meaningful action and see the results of our decisions and choices” — *agency*
1999 — Formal Abstract
Design Tools
What makes Mario 64 so good?

Doug Church asks . . .

And how can understanding that help us formalize concepts for discussing game design?
1999 — Formal Abstract Design Tools

• *Mario 64* has simple and consistent controls offered for movement, & predictable physics, enabling *intention*.

• “A clear reaction from the game world to the action of the player” — *perceived consequence*.

• Also relates to story...

*This process of accumulating goals, understanding the world, making a plan and then acting on it, is a powerful means to get the player invested and involved.*
Agency and Intention

• Murray’s *agency* is “the satisfying power to take meaningful action and see the results of our decisions and choices” with actions that are chosen and related to the players’ intentions.

• Church’s *intention* and *perceived consequence* encourage a “process of accumulating goals, understanding the world, making a plan and then acting on it” with “a clear reaction from the game world to the action of the player”.

• Let’s talk about them together...
Agency and Drama

• Mateas integrates Murray’s agency into Laurel’s neo-Aristotelian drama

• Agency is not “freedom to do anything,” but rather having the material affordances to take actions suggested by the formal affordances of the dramatic situation

Games like Quake balance formal and material affordances (e.g., kill everything that moves) and Façade attempts to balance them for gameplay inspired by kitchen sink drama
Agency and Computational Models

- *Eliza/Doctor* suggests talking about problems (formal) and provides a means (material)

- Starts with expectation, but breaks down:
  
  Can I ask you for help
  DO YOU WANT TO BE ABLE TO ASK I FOR HELP

- The consequences of player action must preserve/build dramatic probabilities

- The consequences come from the system

- Agency requires building a computational model and player understanding of it
Integrated view of agency

- We can see agency as a phenomenon involving both game and player.
- Agency occurs when the actions players desire are among those they can take as supported by an underlying computational model.
- Designing for agency is balancing the dramatic probabilities of the world with the actions it supports — enticing players to desires the game can satisfy.
Summarizing agency

• Supporting agency requires employing or crafting a computational model of the play domain suggested by the work’s dramatic probabilities, for intention and consequence

• Can be a simple model, but game must transition audience from initial expectation to (implicit) model understanding

• Interface is key to expectation — and more “natural” interfaces (AR, voice) set it wrong

• Action more improvisational than assumed
Games and rhetoric
September 12th

Not an animation, but an interaction...
September 12th

- Fictional world: Village of civilians and terrorists, bomb targeting
- Rules: People move continually, bombs take time to fall, dead civilians inspire mourning, mourning inspires terrorism
September 12th

- **Gameplay:**
  - Targeted bombing hits civilians, sprouts as many new terrorists as it kills
  - Indiscriminate bombing creates a wasteland w/ more terrorists than others
  - Procedural rhetoric: Bombing is a poor tool for addressing terrorism
Procedural Rhetoric

• “Procedurality refers to a way of creating, explaining, or understanding processes.”

• “Rhetoric refers to effective and persuasive expression.”

• “Procedural rhetoric, then, is a practice of using processes persuasively.... persuading through processes in general and computational processes in particular.”
What does this mean?

Disaffected!, persuasivegames.com, 2006
Service Games

- From *Diner Dash* to *Disaffected!*
- Coworkers move things randomly, customers come in already exasperated, etc.
- Bogost: “the player is stripped of the power to service customers successfully.... Instead, he is forced to perform under the powerlessness of alienated labor.”
Interpreting rhetoric

• “Just as verbal rhetoric is useful for both the orator and the audience, and just as written rhetoric is useful for both the writer and the reader, so procedural rhetoric is useful for both the programmer and the user, the game designer and the player.”

• We may find procedural rhetoric at work in a game beyond that consciously intended
Many games are ambiguous — interpreting rhetoric requires an argument.
Back to this...
The Sims

• Fictional world: Stylized suburban life, work elided, home decoration, moody “sims”

• Rules: No set goal, must manage moods, basic needs and relationships require work

• Gameplay: Queuing up tasks, compromise, fighting time constraints, paths to goals

• Rhetoric: Suburban life as constant struggle for the basics, w/ unclear goals, but...

• Is this the intended rhetoric?
Good luck Friday!