

The joys of a Friday talk!

I'm losing my voice, you all have planes to catch, and we're all a little hungover...

so let's start before they tear down the stage!

(If you're reading this online, check out all the cool slide animations, I worked really hard on them!)

# JAIME GRIESEMER

Game Designer – 15 Years

BUNGIE

Microsoft  
game studios™



- Myth II: Soulblighter
- Halo 1: Combat Evolved
- Halo 2: No Ending
- Halo 3: The Good One
- Halo 3: ODST
- Halo: Reach
- Infamous: Festival of Blood

My name is Jaime (etc.)

I worked for Bungie (which got bought by MS)

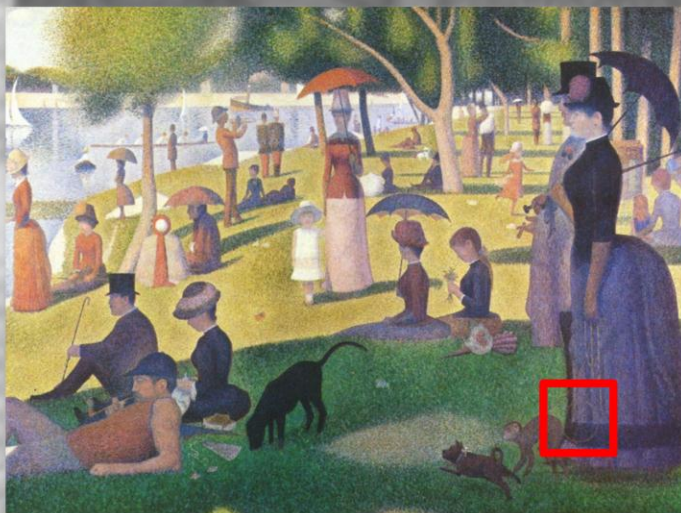
Now I work for Sucker Punch (which got bought by Sony)

I'm an acquisition good luck charm!

I worked on a lot of games with colons in them!

My talks are like drinking from the fire hose. If a slide isn't relevant to what you are working on, just wait, it will change fast!

# GDC 2010



Two years ago, I did a talk about this painting  
"A Sunday Afternoon on the Island of La Grande Jatte" by Georges Seurat

It was about examining just one of the details that make a game, in exhaustive detail.

# GDC 2010

## Design in Detail:

Changing the Time Between Shots for the Sniper Rifle from 0.5 to 0.7 Seconds for Halo 3

BALANCED

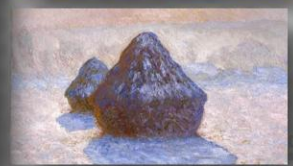
“A state in which a game can be **played indefinitely** by its entire community **without developer interventions** or player conventions”

Specifically, the sniper rifle reload time.

But... it was really about what makes a game “balanced”.



# GDC 2011



Last year, I did a talk about this series of paintings of Haystacks by Monet.

It was about looking at the same detail across multiple games of the same franchise and tracking the changes.

# GDC 2011

## Design in Detail:

### Tuning the Muzzle Velocity of the Plasma Rifle Bolt on Legendary Difficulty Across the Halo Franchise

TUNED

“A game mechanic can be considered tuned when it **correctly constrains** the player experience to have the **desired effect**.”

Specifically, the muzzle velocity of the plasma rifle bolts.

But... it was really about what makes a game “tuned”.



Which brings me to this year...

I've already talked about every Halo game... extensively!

Believe me. You are not as tired of hearing about Halo as I am about talking about Halo.

So I had to find something else to talk about.

## *THE ANNUNCIATION*



I looked for inspiration in my favorite painting, “The Annunciation” by El Greco.

It’s in Madrid and I have seen it in person. It’s like 30 feet tall, so it actually looks more like this.

It shows “The Announcement” by the angel Gabriel to the Virgin Mary, that she would conceive a son named Jesus who would save her people.



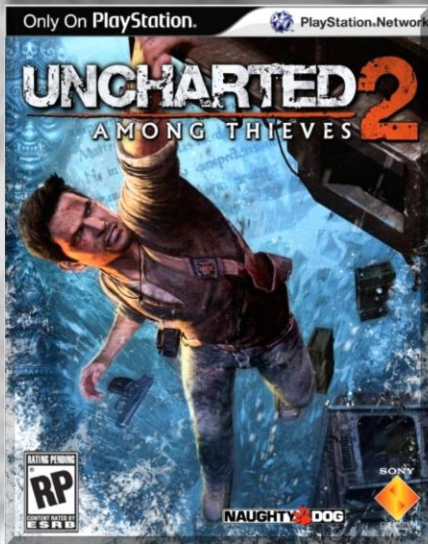


Many, many artists have painted about this moment, all with more or less success, all with different details.

This made me think about visiting the same details across multiple games, and comparing them.

So this year, let's talk about your games, instead!

# IT'S A 7.5



Look for  
problems in  
good  
games...

...and  
promise in  
bad ones.



I'm infamous for giving both Uncharted 2 and Jumper a 7.5 on my blog.  
(<http://thetipofthesphere.com/2011/03/23/its-a-7-5/>)

My motto is learn to see mistakes in good games and promise in bad ones.

# DISCLAIMER

I'm going to criticize some good games!



I'm speculating about games I did not work on.

- I am GUESSING.
- Don't be insulted if I am wrong.
- Don't be insulted if I am right.

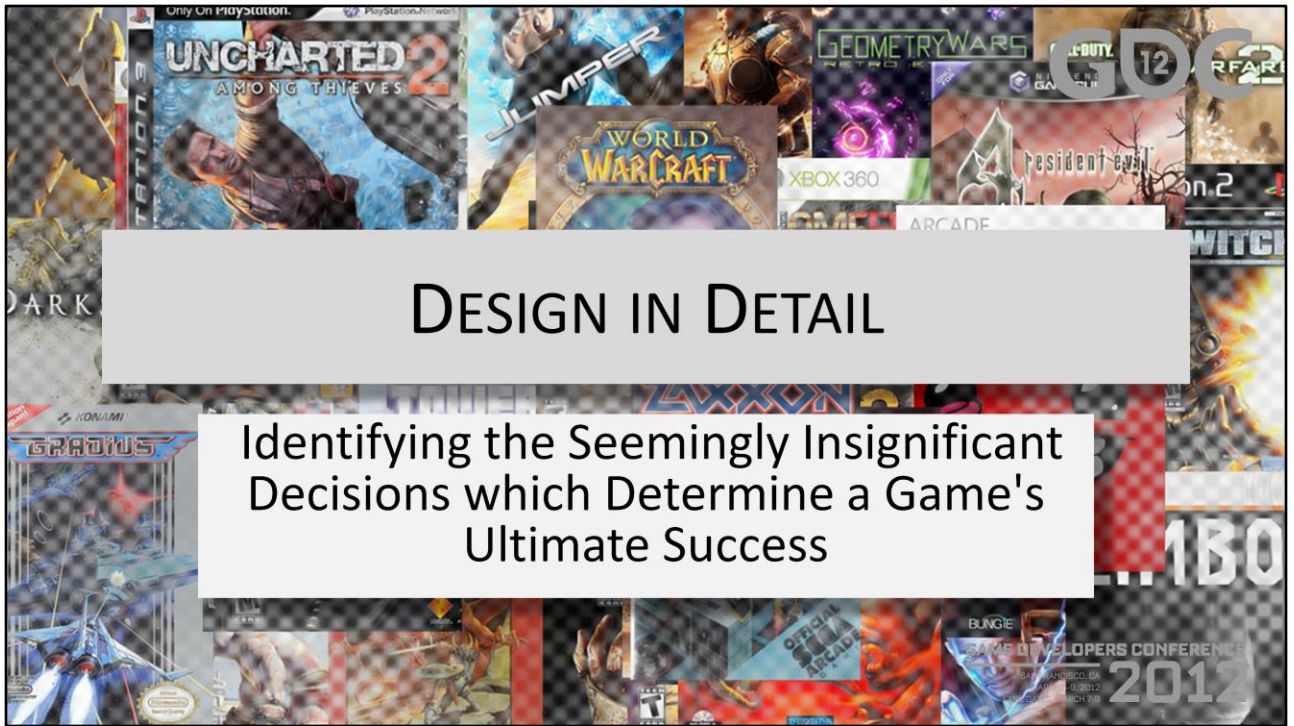
That means I am mostly going to criticize good games!

And since I don't want to spend all my time explaining the game mechanics, I'm going to talk about popular games!

Hopefully I'm not burning too many bridges. Don't get mad. And don't report me to Kotaku!

(If you are reading this online, this goes double for you. GDC is a place where game developers can be honest without worrying about controversy and PR folks. So I don't want to read about how Jaime hates Japanese games, or whatever. The point is to make better games, not start flamewars.)





So, welcome again to Design in Detail. Queue the real title.



# DETAILS ARE SIGNIFICANT

Change 5% of your DNA...

- You are a chimpanzee

Go a few degrees off course...

- You miss Virginia and hit Cape Cod



# DETAILS ARE SIGNIFICANT

Maturing Industry  
Professional Teams  
Familiar Genres



GAME DEVELOPERS CONFERENCE  
2012

A maturing industry with professional teams and familiar genres means:  
Games are pretty damn similar in the broad strokes.

# DETAILS ARE SIGNIFICANT

Details make THE difference  
In Perceived Quality  
In Sales and Success



≠



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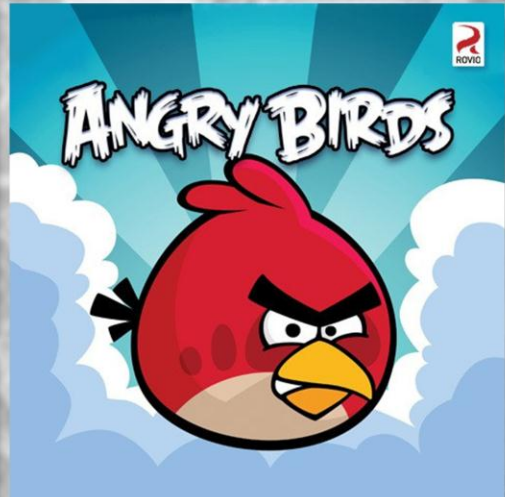
Details make the difference, they are the through line.

# DETAILS ARE POWERFUL

## Nail the Details

- Exquisite controls
- Ideal time investment
- Great reward system
- Perfect timing

...reap the rewards!



Controls are perfect for the platform.  
One level takes about as long as a potty break.  
The reward system works great for their audience.  
And they came out at just the right time.



# DETAILS ARE POWERFUL

## Miss the Details

- Camera control is off
- Animation cycles are unresponsive
- Jumps are a little less clear

...reap the rewards?



On the other hand, Uncharted 3 was overall a good game,  
But the camera control was off (even after the patch)  
The animation cycles are longer, which makes them slightly less responsive.  
The jumps got longer, making it harder to tell where to go.

And they suffered the consequence...

Well, they reaped the rewards, too, I guess.  
We should all make such mistakes...

# DETAILS ARE SUBTLE

Great Art  
Direction,  
right?

No! It's  
great  
Design  
Direction.



Who thinks that Limbo had great art direction?

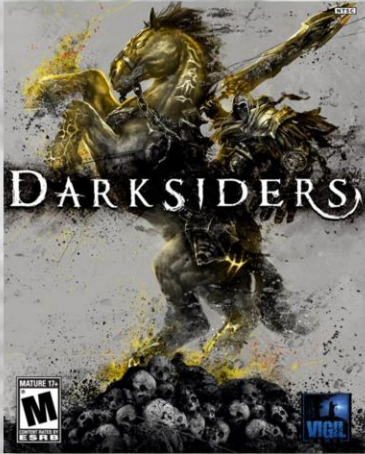
Nope! It has great DESIGN direction.

Is that a bear trap?

Is that a giant spider leg?

Without the uncertainty that results from the art style, there is no gameplay!

# DETAILS ARE PORTABLE



"Greatest Hits"  
of Game Design  
Details

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Hookshot!

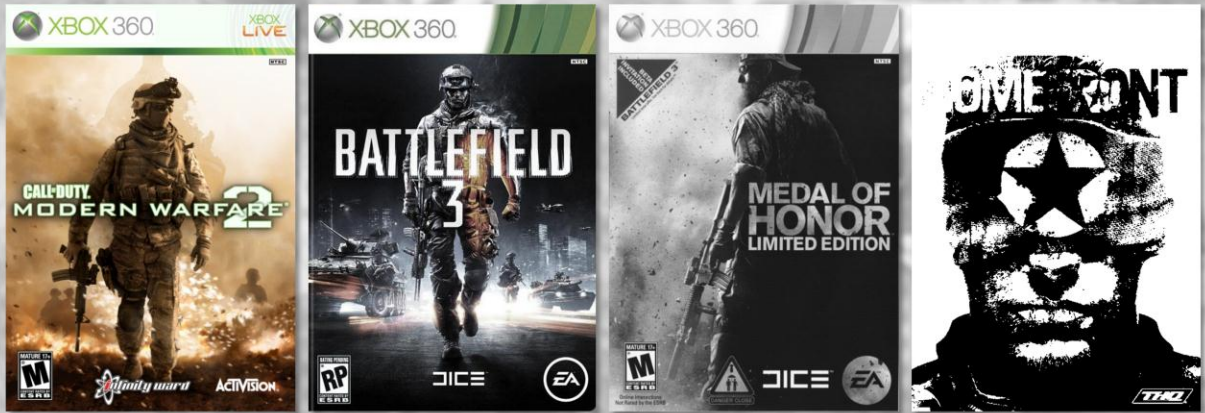
Boomerang!

Portal Gun!

Darksiders borrowed from everybody, but they understood the details, so it worked.

They made a greatest hits album.

# DETAILS ARE PORTABLE



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If you aren't as clear on the details, you get pale imitations.



## DETAILS ARE PORTABLE



And if you don't understand game design at all, you just have to copy everything.

And get caught.

(Yeah, a bridge I'm all too happy to burn.)

# DETAILS ARE MANAGEABLE



Game Design  
“The process of **identifying**, balancing and tuning the important details that define gameplay.”

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Remember Ratatouille, how rat controlled the guy by grabbing his hair? That’s a metaphor for game design.

You can’t make every single decision in the entire game, so grab the important hairs and pull in just the right way.

(In this metaphor, the hairs are the details. And the rat is a designer. Not the most flattering choice.)

Game design is identifying the details before balancing and tuning them.

# MY DESIGN PROCESS



Concept



Constraints



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Eric Zimmerman says to stop instrumentalizing game design...

So let me clarify that this is *my* process, not a universal truth.

First, you have a concept – by definition this is not detailed.

Then you apply the first details, the constraints.

If you like the MDA model these are “Mechanics”, but I prefer to think of them as constraints. If a mechanic breaks, you have to try to fix it. If a constraint doesn’t work, you just need to add further constraints.

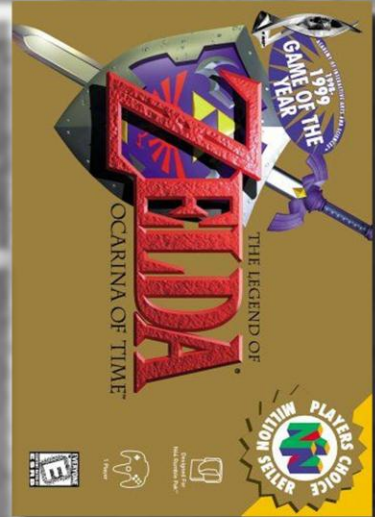
# REMOVING OPTIONS

## Automatic Camera

- The game is about stabbing fools!
- Constraints == Freedom

## Automatic Jumping

- The game is about exploring the world.
- Constraints == Frustration



You can think of constraints as removing options.

God of War was improved by the constraint of an automatic camera.  
It let the player focus on what was important.

Zelda was made worse by the constraint of an automatic jump.  
It undermined the feeling of exploration.



# CORNERSTONES

## Engagement Distance

- Movement Speed
- Camera Field of View
- Weapon Accuracy
- Enemy Counts
- AI Firing Parameters

Engagement Distance -> Environment Scale



In Halo, the engagement distance was set first. Everything else was based on that initial choice.

How fast can you reach enemies?

How large are the enemies on screen?

How accurate do your weapons need to be to hit them?

How many enemies can we fit in that range?

How soon do the enemies start firing?

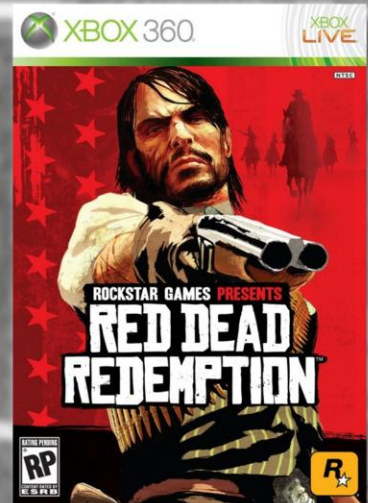
What size environment supports that combat?

# CORNERSTONES

## Environment Scale

- Movement Speed
- Camera Field of View
- Weapon Accuracy
- Enemy Counts
- AI Firing Parameters

Environment Scale -> Engagement Range



In Red Dead, environment scale was determined first and set the rest of the details.  
How fast do you have to move through large environments?  
What camera FoV shows the whole world?  
How accurate to shoot at range?  
How many enemies fill a gigantic world?  
How soon do the enemies need to start firing?

What range of combat fits all these values?

# SOLVING FOR GAMEPLAY

## Computer RPGs

- Higher Level == Higher Damage
- Leads to an exponential curve
- Over-leveled content is trivial

## Dungeons & Dragons

- Higher Level == More Access (THACØ)
- Leads to a flatter curve
- Over-leveled content is still engaging



Another way to look at this is as an algebraic equation. Solve for what matters.

Computers work with large numbers. So it is easy to equate level with higher damage.

The problem is you get an exponential curve.

Dice have limited digits. So level means more scope, more access.

It's a flatter curve, so overleveled content is still interesting.

# SOLVING FOR GAMEPLAY

Enemy Health

=

Time to Kill

Damage/Shot

X

Shots/sec

Time to Kill

=

Shots/sec

X

“Shots to Kill”

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(You really should watch the animation on this one.)

You are designing a damage system. The programmers give you the obvious fields:

You have a field for how much damage a shot does

You multiply that by the number of shots per second to get damage per second

You divide the enemy health by that and you get time to kill

But the player doesn't experience it that way at all.

They know how long it takes to kill an enemy and how fast their weapon shoots.

They don't care how you get to “Shots to kill” so make sure you determine the non-abstract values first.



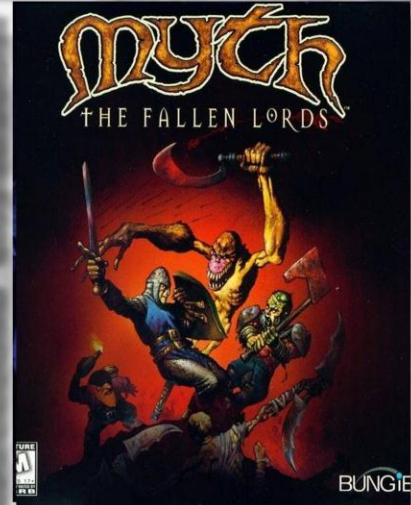
# IMAGINARY CONSTRAINTS

## Starcraft

- “Symmetrical Factions”
- Warcraft was Orcs vs **Pink Orcs**
- Resists a static balance

## Myth

- “Resource Management”
- Multi-tasking combat and economy
- Sense of immediacy



Often designers need to force something to work

Not enough time

Not enough effort

Don't get stuck repeating them without analyzing them first.

Starcraft jettisoned the idea of symmetrical factions. Myth got rid of resource management.

# SYSTEM REQUIREMENTS



## Minimum System Requirements:

"A 20 MHz 386 machine or better is recommended"

"2x speed CD-ROM drive is required"

Also the Maximum System Requirements!

A few years ago, I sat down to play a game I missed when it came out – Star Control II.

My rig met the minimum system requirements, but when I got to my first battle, it was over in less than a second!

I exceeded the system requirements to the point where I couldn't play anymore, it was too fast.

# MENTAL SYSTEM REQUIREMENTS

Our brains have a certain capacity.

- 3 pounds of meat
- 20 watts of energy
- Obsolete firmware

Don't expect too much...



Games stretch our capacity

Our brains have system requirements too.

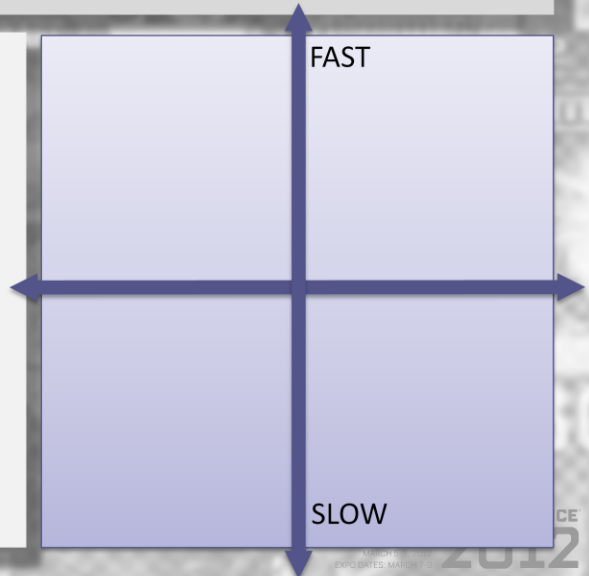
I've heard it called attention, focus, engagement.

And we have minimum and maximum requirements, too.

# MENTAL SYSTEM REQUIREMENTS

Capacity is a function of speed

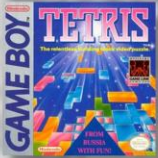
- Faster games == more capacity
- Slower games == less capacity



Just like Star Control 2, we have different capacities at different speeds. If you go too fast, your game takes more capacity than people have.



# SPEED



## Tetris (Game Boy)

- Quickly reaches full capacity
- Stays there for ~16 levels



## Tetris (iOS)

- Slowly reaches full capacity
- Quickly overwhelming



## New Tetris (iOS)

- 4-5 options
- Reduces complexity



Tetris is a great example of this (somewhat obvious) statement.

The original got fast enough, then stayed there.

The iOS version was too slow, then suddenly got too fast.

The new one has a different mechanic, so it hits the sweet spot longer.

It did this by changing complexity.

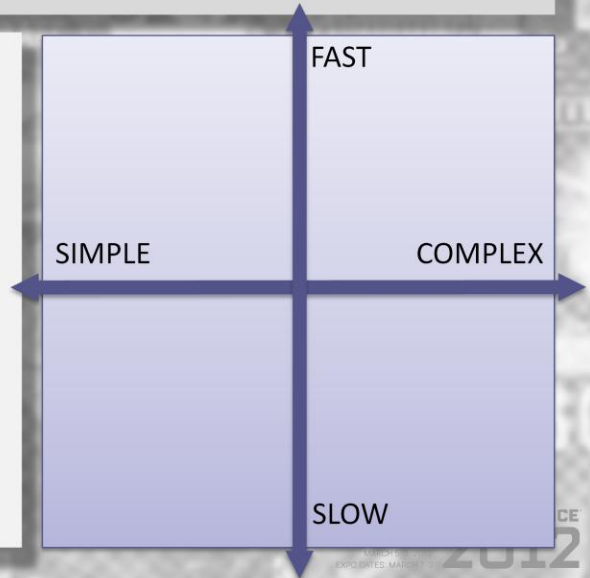
# COMPLEXITY

Capacity is a function of complexity

- Conceptual complexity
- Mechanical complexity
- Information complexity

Simpler games == less capacity

Complex games == more capacity



This applies to all kinds of complexity.

# MENTAL SYSTEM REQUIREMENTS



## Xevious

- Simple screen layout
- Simple graphics
- Simple inputs
- Fast and fun

## Zaxxon

- Complex screen layout
- Complex graphics
- Complex inputs
- Fast and frustrating



Both of these games came out in 1982, both have the same speed.

Xevious has low complexity, and I loved it.

Zaxxon has high complexity, and it was too hard.

# MENTAL SYSTEM REQUIREMENTS

Where is your game?

- Fast and Simple?
- Slow and Complex?
- Fast and Complex?
- Slow and Simple?

Stay in the “Game Band”



Fast and simple, you get Gradius.

Slow and complex, you get Civ.

Too fast and complex, you're trying to fly a jet.

Too slow and simple, it's just poking a screen.

Only two of these are games (take that, Farmville).

# MENTAL SYSTEM REQUIREMENTS

## Max Payne

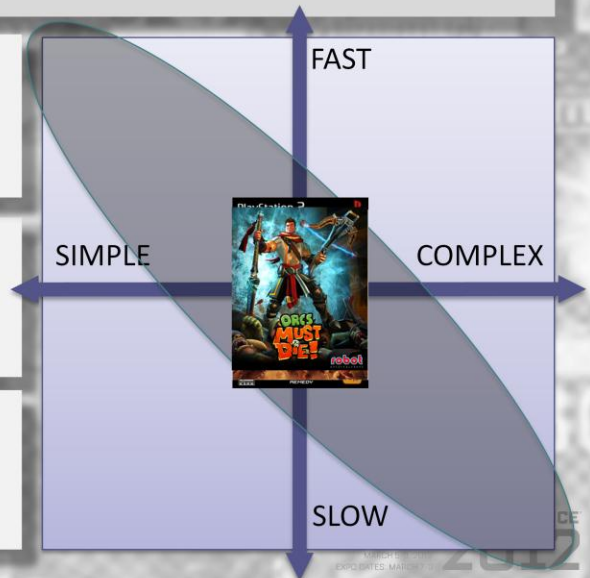
- Fast and Simple
- Slow-mo when Complex

## Horde Mode

- Simple set-up
- Complicated waves

## Orcs Must Die

- Complicated set-up
- Simple waves



Max Payne - Usually fast and simple, but you can slow time when it gets complex

Horde Mode – Set-up is usually too slow and simple, the action is usually too fast and complex, there isn't much range here.

Orcs Must Die – The set-up is slow and complex, the action is fast and simple, much more range.



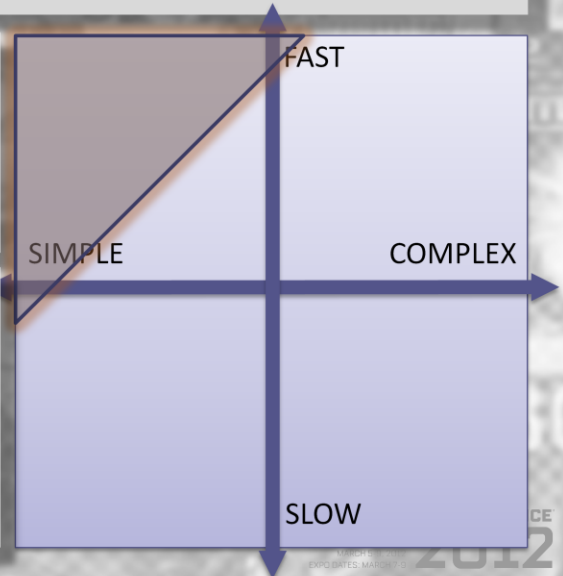
# MENTAL SYSTEM REQUIREMENTS

## Continuous Interactions

- Moving
- Aiming

## High Dexterity

- 1 or 2 at a time
- Thumbsticks
- Mouse (not Keyboard)



Our brain is pretty specialized, so let's break down our capacity a little.

One thing we can do is continuous interactions, but not very many.

# GOOD AND BAD

## Geometry Wars

- Constant double-deflection
- No other inputs

## Halo

- Often double-deflection
- Limited the audience

## Kill Switch

- Rare double-deflection!
- More accessible



Geometry Wars maxes out your continuous interaction,  
That's ok, because it does nothing else.

Halo has intense continuous reaction, which I think limited the audience (still a big one, and growing)

Kill Switch is the first cover shooter. You probably never played it.  
It uses both sticks, but not at the same time. You are either moving OR shooting, rarely both.  
It's much more accessible. I think this is why cover shooters are so big.

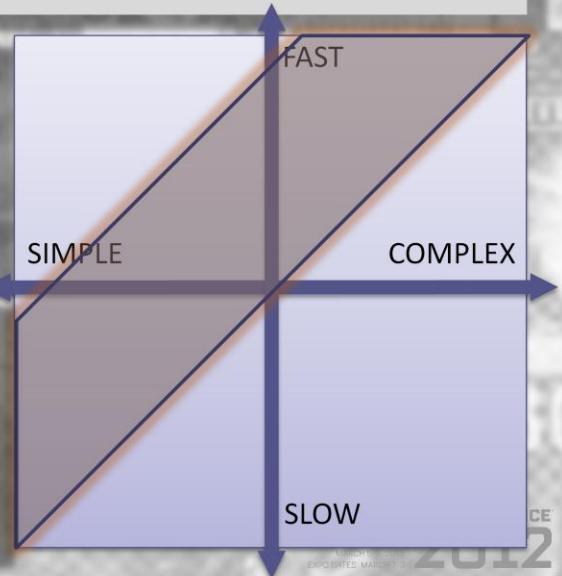
# MENTAL SYSTEM REQUIREMENTS

## Common Actions

- Firing Weapons
- Throwing Grenades
- Melee Attacks

## High Attention

- 2 or 3 at a time
- Triggers/Face Buttons
- Not **all** of them



Another quality of capacity is common actions.

Requires continuous attention but not interaction.

A good rule of the thumb is face buttons, but maybe not all of them.

You have more buttons than people can handle.

# MENTAL SYSTEM REQUIREMENTS

## Infamous 2

- Going into aim mode (L1) changes the face button
- Inhibits gameplay

## Random Access Game Design

- 1 action = 1 button
- Always available
- If it doesn't fit, cut it



Infamous 2 has “button salad”, aiming remaps the whole controller!

So I went to Sucker Punch to help fix it. (heh)

“Random access game design” is a new buzzword I invented to describe my design aesthetic. It means that every action is always available.

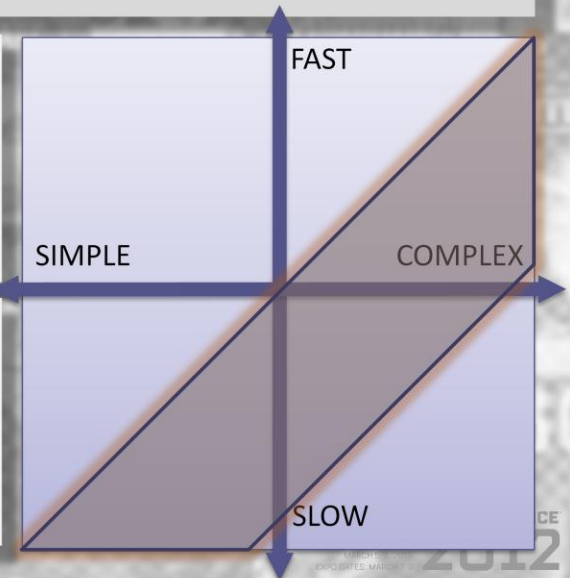
# MENTAL SYSTEM REQUIREMENTS

## Uncommon Actions

- Reloading
- Jumping
- Zooming

## High Understanding

- 3 to 6 at a time
- Face/Shoulder Buttons
- “That’s what she said”



Moving farther down and to the right, we find uncommon actions.

It's like the lame "That's what she said" joke. You are rarely consciously thinking about it, but some part of your brain checks to see if it is funny after everything anyone says, and when it works, you are saying it before you realize.



# MENTAL SYSTEM REQUIREMENTS

## Environmental Skillshots

- Limited pace set by environment
- Strong external cues
- Opportunistic and Efficient

## Weapon-specific Skillshots

- Unlimited pace set by player
- Required menu-mining
- Burdensome and Inefficient



Bulletstorm is based on skillshots. They drive the progression economy, and featured heavily in the marketing.

Knocking enemies into spike traps is great!

Stunning enemies into dropping their pants is not.

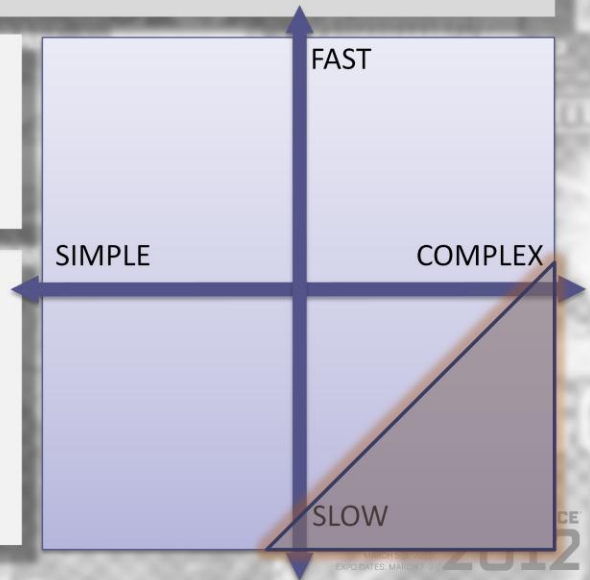
# MENTAL SYSTEM REQUIREMENTS

## Prompted Actions

- Inventory screen
- Usable objects

## Untimed means unlimited

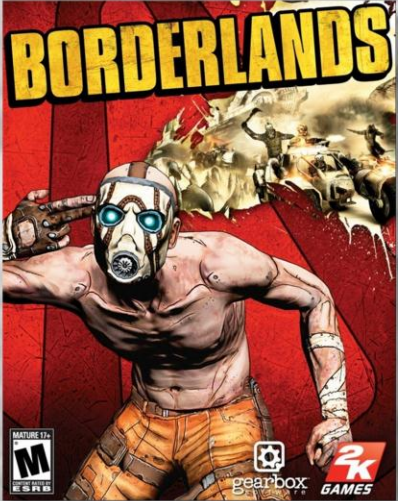
- As many as you want
- Any input you want
- Explain them every time



In this corner, the slowest, most complicated form of action.

Have as many as you want, just know that you have to explain it every time.

# MENTAL SYSTEM REQUIREMENTS



## Borderlands Loot

- Gathering money
- Comparing weapons
- Equipping items

## Borderlands Healthpacks

- Combat activity
- Often under pressure
- Aiming to collect is hard

The major innovation of Borderlands was adding lots of these prompted actions. It works great when collecting and comparing loot.

But they used the same system for their health mechanic, which was too difficult to do under time pressure.

# THE DESIGN PROCESS



Concept



Constraints



Interactions



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You might call it Dynamics

But don't forget that the player is the cause of the complexity

# PHYSICAL LIMITATIONS

## Puck-Man (in Japan)

- Japanese arcades use 4-way sticks
- Pac-Man uses cardinal directions



## Pac-Man (in America)

- American arcades use 8-way sticks
- Pac-Man ignores diagonal inputs...
- And the input that follows them!

Even at an early age, I was sensitive to details - I never really got Pac-man.

It turns out, that is because most Pac-man machines in America are broken.



# PHYSICAL LIMITATIONS



## Dungeon Hunter II

- “Virtual” buttons
- Continuous input
- Reaction-time tests



## Infinity Blade II

- Gestures, not buttons
- Infrequent input
- High-latency tolerance



Dungeon Hunter refuses to acknowledge the iPhone's Input limitations  
A picture of a button isn't a button  
Your thumb is always on the screen  
Reaction-time tests aren't fair in a latent environment

Infinity Blade does better  
Gestures are natural  
Less input, more screen time  
Not reaction-time tests

(Excellent job understanding the details of Punch-Out, btw)

# RESPONSIVENESS

## The Gunstringer

- Crosshair is smoothed to prevent jittering
- Causes +100ms delay



## Fruit Ninja (for Kinect)

- Spline is smoothed in real time
- No perceivable delay

Your brain merges events that happen less than 100ms apart.

(I wrote about this: <http://thetipofthesphere.com/2012/01/30/design-by-numbers-simultaneous-perception/>)

# RESPONSIVENESS

## Halo 3

- ~100ms
- 3.5 frames at 30fps

## Killzone 2

- 150ms
- 9 frames at 60fps

## Call of Duty: MW2

- ~67ms
- 4 frames at 60fps



Shooters are incredibly sensitive to input latency. CoD is the industry standard.

# PLAYER INTERPRETATION

## Auto-Aim

- Shooting from gun
- Pegged means “turn fast”
- Bullets aimed toward enemies

## Aim-Assist

- Shoot from the crosshair
- Pegged means “turn faster”
- Slow over an enemy means “stop faster”



Auto-aim – Interpreting the player’s goals

Aim-Assist – Interpreting the player’s intentions

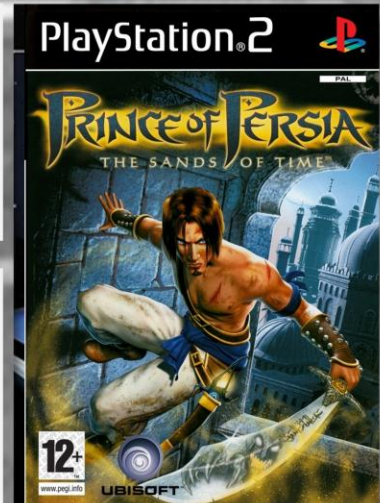
# PLAYER INTERPRETATION

## Jump Steering

- Mostly vertical jump
- Auto-steering *during* jumps
- Stick the landing

## Jump Prediction

- Mostly horizontal jump
- Auto-steering *before* jumps
- Leap to my death (rewind)



Another, similar example of the differences in how the player's interaction can be interpreted leading to vastly different experiences.



# REPETITION

## Intuitive Jumps

- Responsive input
- Not a physical arc
- Crisp air control

## Simulated Jumps

- Latent input
- Simulated jump arc
- Sluggish air control



High-frequency occurrences

When you are data-mining, track the actual frequency of events

Not the intended frequency

Not the perceived frequency

Not the desired frequency

(Note: I skipped over this slide during the presentation, because it seemed too obvious.)

# FLAVOR

## Set the game's tone

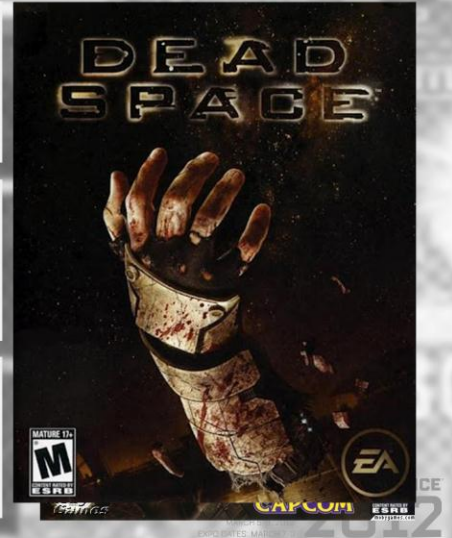
- Aiming under pressure
- Scarce resources

## Resident Evil 4

- Unable to move while shooting
- Limited ammo pick-ups

## Dead Space

- Multiple dismemberment points
- Algorithmic ammo pick-ups



A detail that determines the tone of the game. Both of these games have similar tones, but the mechanics that establish those tones are very different. (And Dead Space is better.)

# REWARDING PLAY

## Motivating Rewards

- Drive behavior
- Color every experience
- Often clash with an activity

## Good or Evil?

- Promises “choice”
- Power rewards for grinding
- No actual choices



As I become better at the craft of game design, I see it more and more as a problem of linking rewards to player motivations. Karma systems are so difficult to design, mechanically speaking, because the motivations are so complex and aren't necessarily the same for all players.

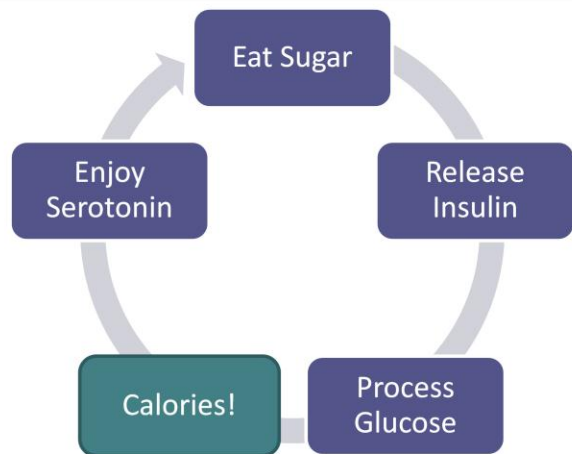
# WE LIKE SUGAR

## Calories

- A fundamental human need
- Evolved reinforcement

## The Serotonin Cycle

- Insulin before calories
- Serotonin after calories
- The satisfaction trails the actual need fulfillment



Real sugar is the best source of calories.

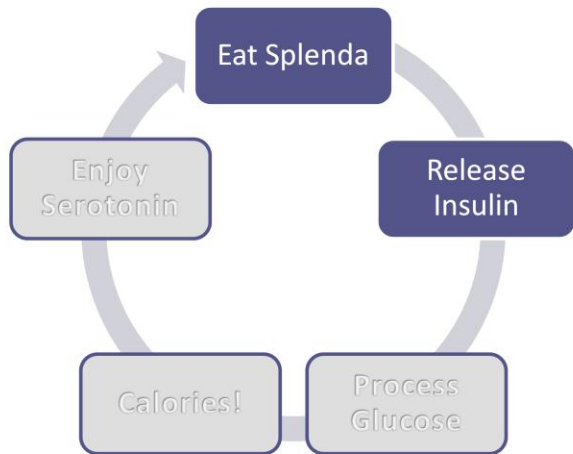
# FAKE SUGAR

## Artificial Sweeteners

- No calories
- Skip "process glucose"
- No need is actually met

## Just Insulin, No Serotonin

- Hyperinsulinemia
- Hypoglycemia
- Weight Gain



Fake Sugar looks, feels and tastes like real sugar, but is ultimately unsatisfying.



# WE LIKE GAMES

## Psychological Needs

- Autonomy
- Competence
- Relatedness

## The Dopamine Cycle

- Aspiration before success
- Dopamine after success
- Dopamine trails the actual need fulfillment



We like games because they are one of the best sources of psychological need fulfillment in the modern world.

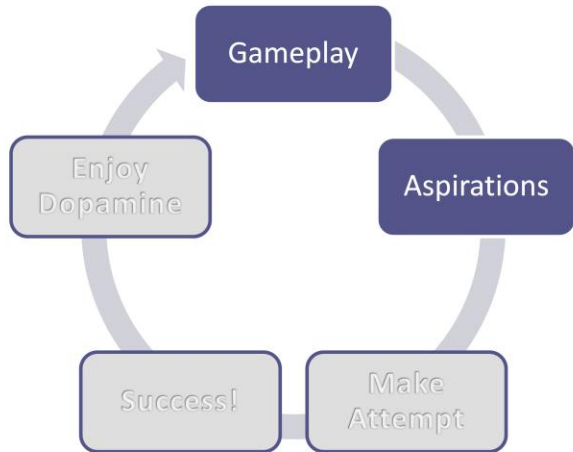
# GAMIFICATION

## Artificial Rewards

- No psychological exercise
- Skip "success"

## Just Aspirations, No Dopamine

- Frustration
- Futility
- Demotivation

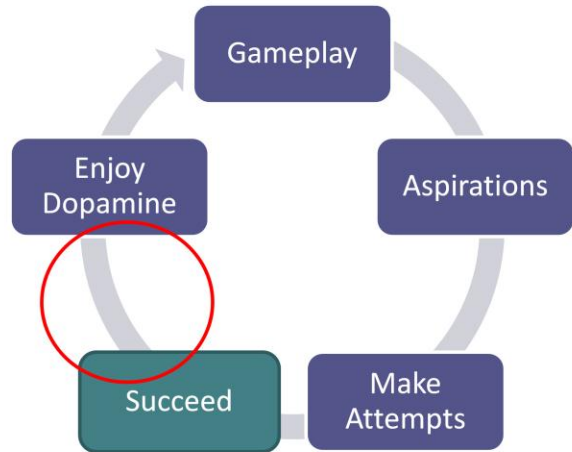


But gamification only looks like need fulfillment, so it is also unsatisfying

# INCREASE CONNECTION

## Between Success and Reward

- Reward the same need
- In the same spirit
- With the same timing
- At the same frequency
- Without undercutting the attempts



You can increase the connection between the player's success and how they experience the satisfaction.

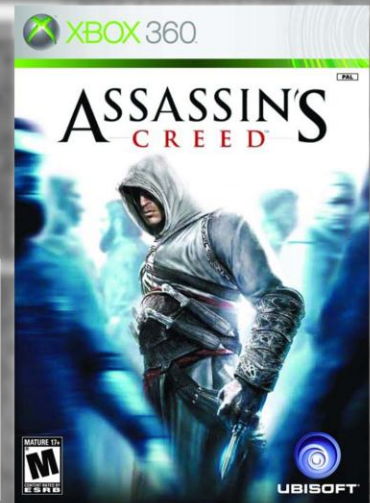
# INCREASE CONNECTION

## Flag Collecting

- Forced tutorial
- 1 of 50,000 Flags
- Unknown reward

## Investigations

- Pickpocketing, Eavesdropping
- “Easier assassinations”
- Completionism is not a motivation



Assassin's Creed struggles with this, because the activities are not really linked with a common human need.

# INCREASE CONNECTION

## Interview Tapes

- Found by exploring
- Not forced (Autonomy)
- Rewarded by backstory (Relatedness)

## Riddler Trophies

- Found by exploring
- Multiple Platform Trophies (20%)
- Riddler is pissed (Competence)



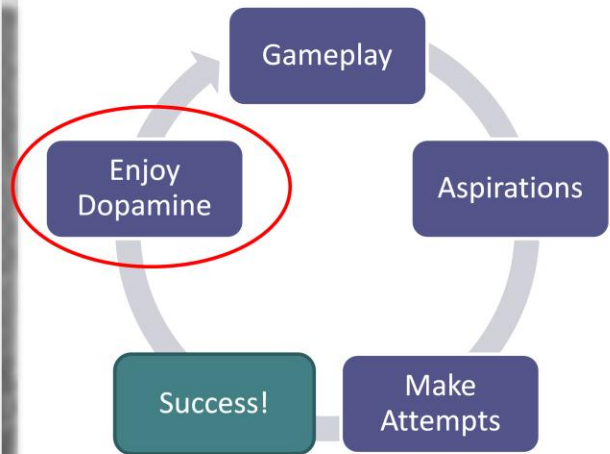
Batman is great at this.



# AMPLIFY SATISFACTION

## Prime the Dopamine Pump

- Timing
- Mood
- Ceremony
- Value



Several factors contribute to dopamine generation. There's lots of good research available, but you can just go to Las Vegas and look around.

# AMPLIFY SATISFACTION

## Game Center

- Delayed an arbitrary amount
- Antique billiard table?
- No ceremony or celebration
- No actual value

Poor dopamine generation



Game center is so bad, it is actually a negative experience that undermines achievements on iOS.

# AMPLIFY SATISFACTION

## Batman: Arkham Asylum

- At the moment of the realization of success
- Flurry of Bats and Music
- Count every point!
- Valuable power upgrades

Great dopamine generation

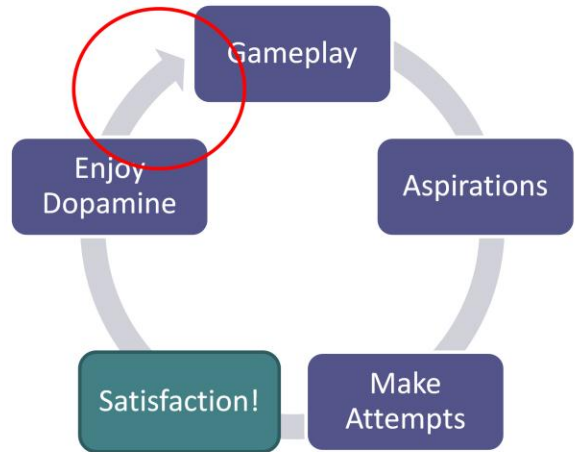


Batman is great at this.

## CONTINUE THE CYCLE

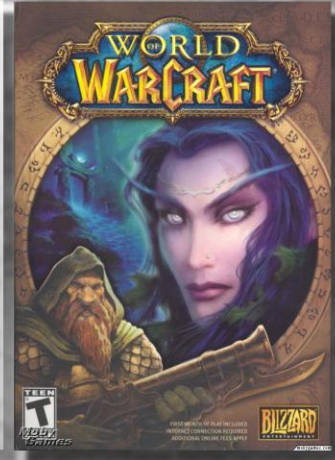
“Reward an activity with more of that activity.”

– Scott Rigby



One of the most useful pieces of advice I ever received. You have to close the loop because repeatable need-fulfillment activates are much more valuable.

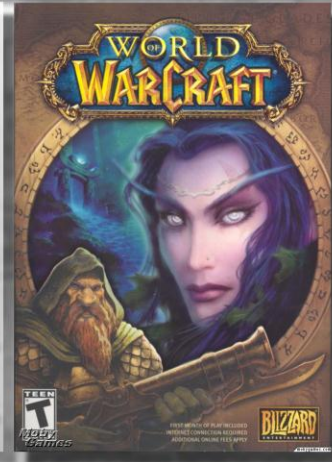
## CONTINUE THE CYCLE



WoW used to do this really well. The only activity that did not lead to more of that activity was how leveling lead to raiding. IMO, this one mismatch lead to a lot more mismatches, which made the game much less satisfying.



## CONTINUE THE CYCLE



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Everyone has their personal theory “what is wrong with WoW”. Here’s mine.

The cycles are all crossed. You end up spending a LOT of time doing things you don’t want to do, just so you can engage in a little of the activity you prefer.

# CONTINUE THE CYCLE

## Combat XP

- Build combos
- Earn XP bonuses
- Purchase combat upgrades
- Fight better

## Challenge Rooms

- Complete a series of challenges
- Unlock harder challenges



Batman does a great job at this. 8)

# THE DESIGN PROCESS



Concept



Constraints



Interactions



Harmonics



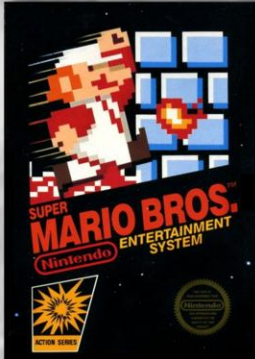
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Harmonics...

I'm starting to see game design as being closer to music composition than any other mainstream art (like movies, writing, etc.) So many of the same principles apply.

# CONCEPT

## The game in your mind - 2D Platformer



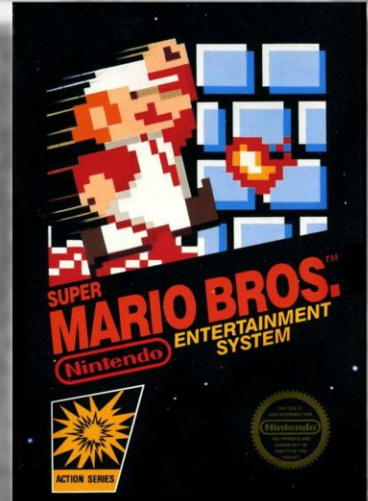
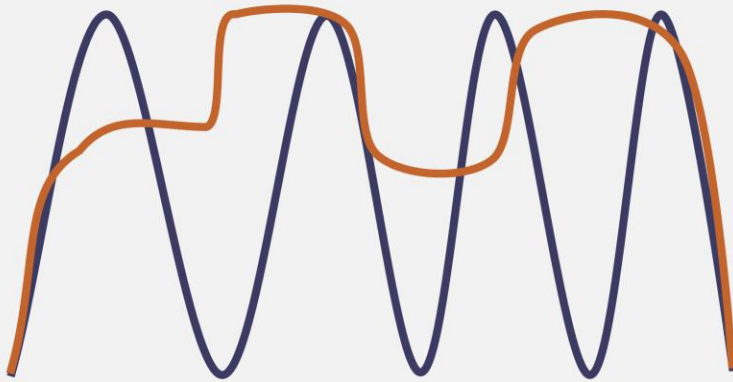
- Character runs to the right
- Occasionally killing enemies
- Ultimately fighting a boss



Given the same concept, different constraints lead to different harmonics.

# SUPER MARIO BROTHERS

## Harmonics



## Constraints

- Go right
- Jump, Stomp and Fireball (sometimes)
- Mushroom power-ups

## Interactions

- Jump over pits
- Stomp on enemies
- Fireball enemies (sometimes)

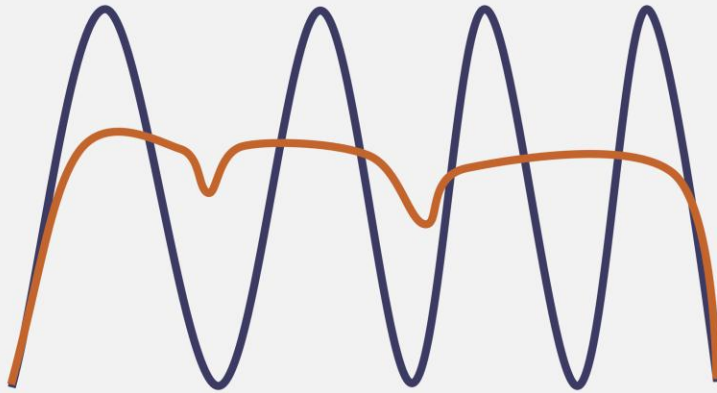
## Harmonics

- Pit – Jump, Pit – Jump, Enemy – Jump
- I'm small, I'm big, I'm small, I'm big, I'm dead



# SONIC THE HEDGEHOG

## Harmonics



## Constraints

- Go right
- Jump and Spin Attack
- Ring powerups

## Interactions

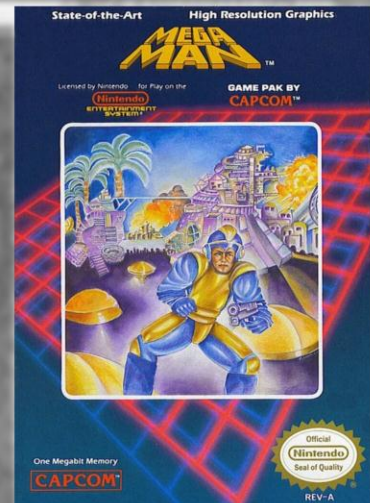
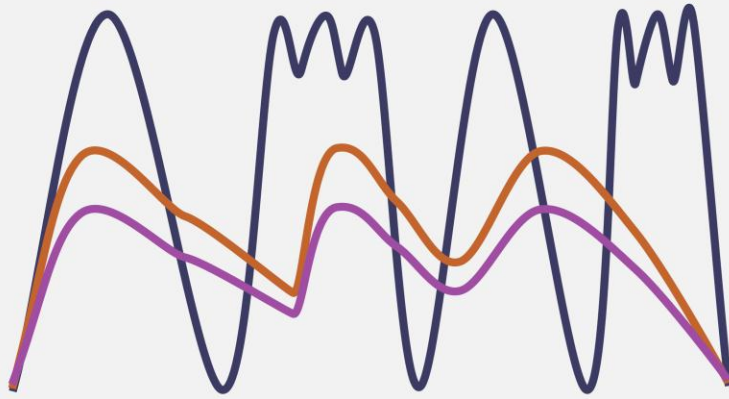
- Jump over pits
- Spin Attack enemies
- Life insurance

## Harmonics

- Jump Jump Jump Jump Jump
- Over pits, into enemies

# MEGA MAN

## Harmonics



## Constraints

- Go right, sometimes up
- Jump and Shoot
- Health and Ammo powerups

## Interactions

- Jump over pits
- Shoot enemies (multiple hits)
- Life bar

## Harmonics

# KEY CHANGE

## Bowser

- Big Mario charges
- Small Mario dies



## Eggman

- Spin Attack vs Large Boss
- One ring left – again!

## Guts Man

- Health bars
- Specialized ammo



Where harmonics break is when you change the underlying structure, like in a boss fight. A really well-constructed game will still work, a poorly designed game will be very fragile.

# PACE SETTERS



## Sniper Firing Time (GDC 2010)

- Increase time to kill
- Longer fights

## Plasma Bolt Velocity (GDC 2011)

- Decreased time to react
- Shorter fights

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I did two talks on pace-setting details already!

# CYCLE RESETS

## Magic: The Gathering

- Ending a turn
- Under the player's control
- Resets mana (ammo) and chunks up strategic decisions

## Bioshock

- Dying and Vita-Chambering
- Fails to restart a cycle
- Diverges health from ammo



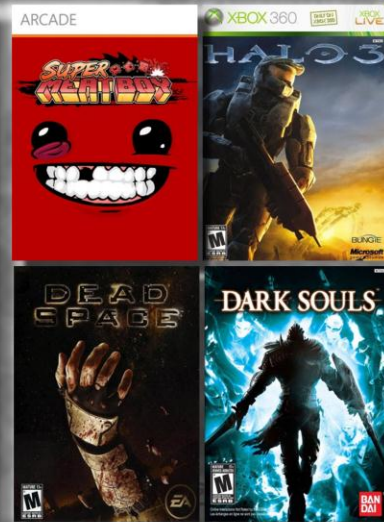
Details that restart a cycle are always important



# CONCEPT

## Different harmonics

- Different pace
- Different cycle resets
- Different scales



Let's look at how different games have the same harmonic structure.

(I admit, I bailed on my plan at this point. I wasn't going to take questions because they are ALWAYS lame and a waste of time, but the GDC board got mad at me for going over every year, so I skipped the next couple slides. It would probably have taken me an extra 10 minutes to go through them properly. I'm going to write something about them, instead.)

# SUPER MEAT BOY

## Damage and Death

- No health
- Instant death

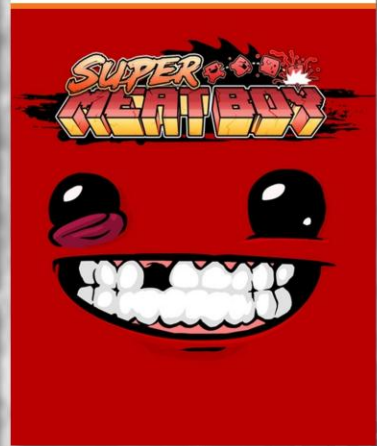
## Saves and Progress

- No voluntary saves
- Very short levels
- No downtime

## Pace is very fast

- Only rewards perfect play
- Requires total mental focus

ARCADE



Demanding challenge – Split second timing

Requires perfection - One-hit kills

Small units of progress – Very short missions

High mental focus – Sloppiness removes all progress

Minimize frustration – Instantly back in the action

# HALO

## Damage and Death

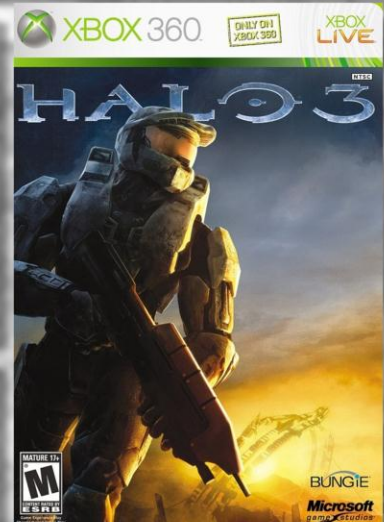
- Quickly recharging health
- Second mistakes leads to death

## Saves and Progress

- No voluntary saves
- Checkpoints after every encounter
- No downtime

## Pace is fairly fast

- Only rewards perfect play
- Requires total mental focus



Demanding challenge – Repeatedly out-aiming the enemy

Requires perfection – A string of successful shots

Small units of progress – Frequent checkpoints

High mental focus – Game moves very fast

Minimize frustration – Instantly back in the action

# DEAD SPACE

## Damage and Death

- Limited health resource
- Any damage is unacceptable

## Saves and Progress

- No voluntary saves
- Checkpoints after every fight
- No downtime

## Pace is fairly slow

- Only rewards perfect play
- Requires total mental focus



Demanding challenge – Shooting under pressure

Requires perfection – Taking damage, wasting ammo, not acceptable

Small units of progress – Checkpoints and storage lockers

High mental focus – Easily overwhelmed or surprised

Minimize frustration – Instantly back in the action

# DARK SOULS

## Damage and Death

- Lots of health (5-10 health packs)
- Death is an approaching horizon

## Saves and Progress

- No voluntary saves
- Every single enemy defeated is progress
- No downtime?

## Pace is very slow

- Only rewards perfect play
- Requires total mental focus



Demanding challenge – Very tactical fighting

Requires perfection – Death comes *very* quickly

Small units of progress – Every enemy you figure out makes it easier next time

High mental focus – Surrounded or surprised, you die

Minimize frustration – Load Screen hints are GOLD



# THE DESIGN PROCESS



Concept



Constraints



Interactions



Harmonics



Gameplay

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## QUESTIONS?

the tip of the sphere.com

@32nds “thirty seconds”

jaimegriesemer at gmail.com



Sucker Punch is  
Hiring Designers!

2012