Video Game Design

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Game Feel

Game Feel

- “Game Feel: A Game Designer's Guide to Virtual Sensation” by Steve Swink

Some describe real-time games with descriptors like "floaty", "responsive", and "loose" or compare them to other games saying it needs to "more responsive, like asteroids" but there lacks a formal definition.

Others try to be more formal and fall into different camps of what is game feel.

intuitive controls, "easy to learn but difficult to master"

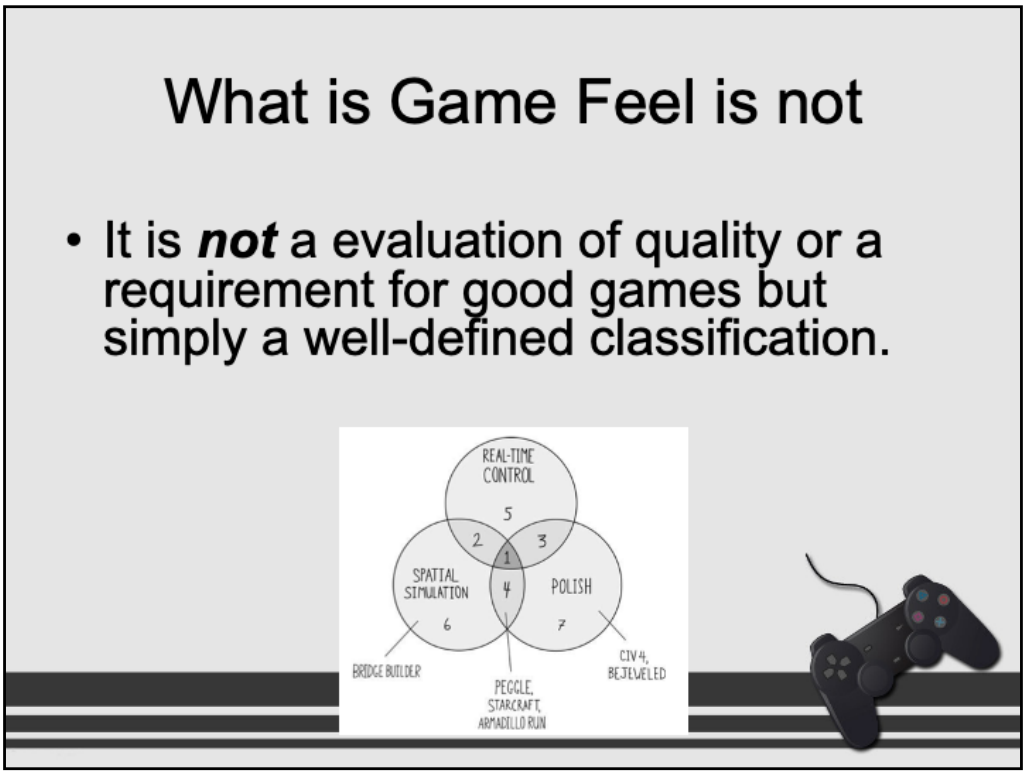
"physical interactions with virtual objects"

immersion, “making the players feel as though they’re really there”

appeal, “layering effect on careful effect, polishing everything”

So, What is **Game Feel**?

- Swink breaks up game feel into three building blocks
  - **Real-Time Control**
  - **Simulated Space**
  - **Polish**
- Defines a basic working definition:
  - Real-time control of virtual objects in a simulated space, with interactions emphasized by polish.



Game Feel:

SF2

Limited RT Control:

Prince of Persia

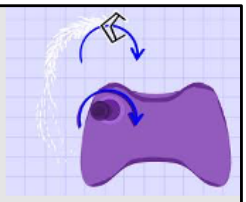
Polish only:

Guitar Hero

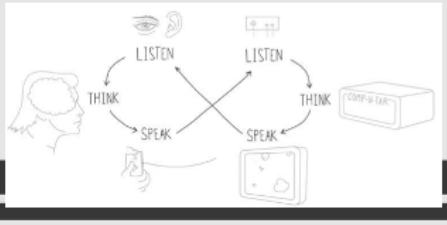
Spatial Sim/ Polish:

Kirby: Canvas Curse

Real-Time Control

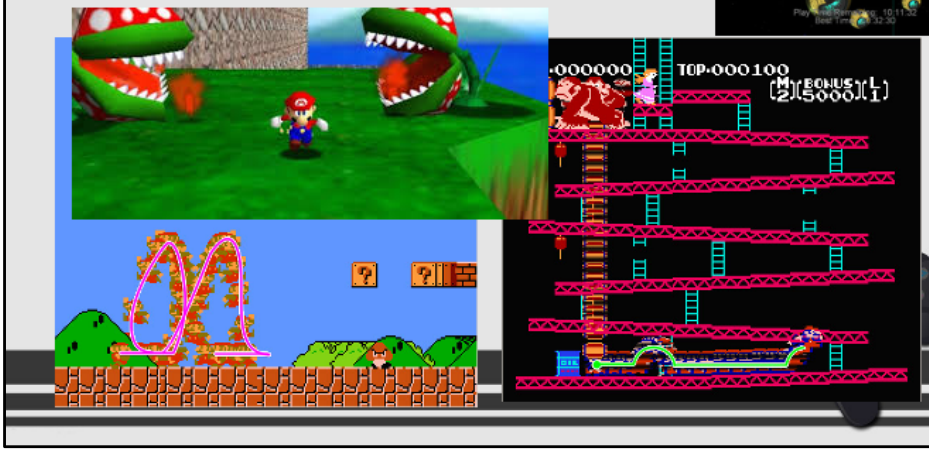


- Real-time control is a specific form of interactivity.
- precise, continuous control of a moving avatar.
- >=10 FPS sim with <=100ms response to input
- Limited (or no) input “lock out”
- like driving a car



RT Control - Response

- Immediate/Direct or
- Indirect but varied over time

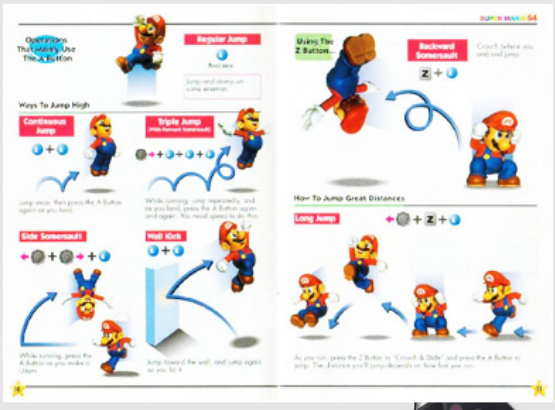


Simulated Space

- Simulated space refers to simulated physical interactions in virtual space, perceived actively by the player.
- This means collision detection and response between a real-time controlled avatar and objects in a game world.
- The other necessary component for simulated space is that it must be ***actively perceived***.

RT Control - Context

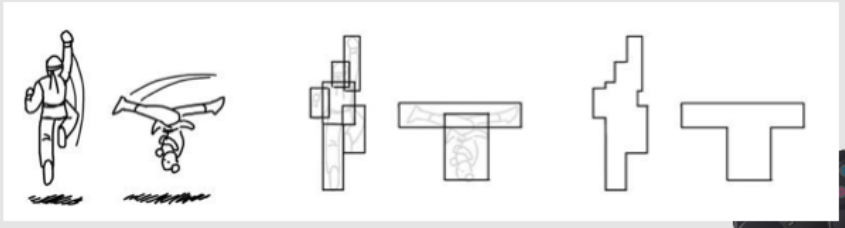
- Character state AND environment defines available actions controllable by inputs



Triple jump, wall jump, etc

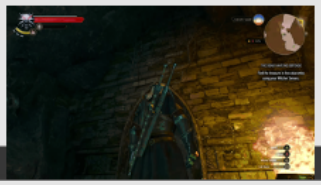
Polish

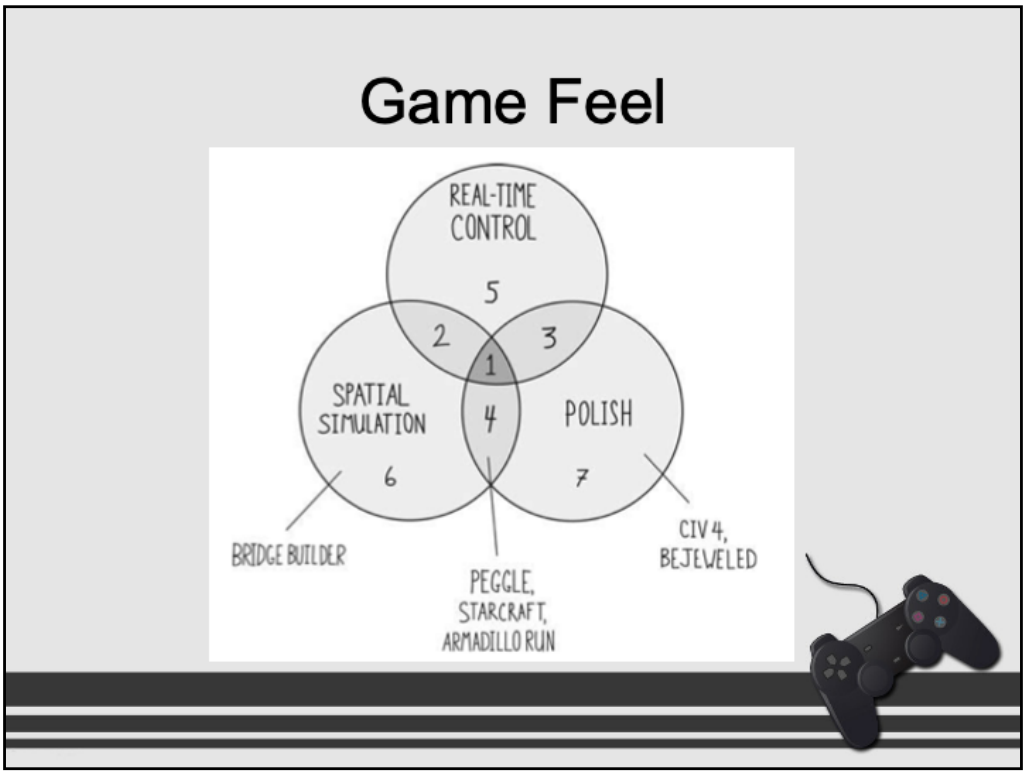
- Polish refers to any effect that artificially enhances interaction without changing the underlying simulation.



Polish

- Accentuate interactions through:
  - Motion (e.g. squash and stretch, vibration)
  - Visual
    - Shape, color, texture suggests nature of interactivity
  - Sound





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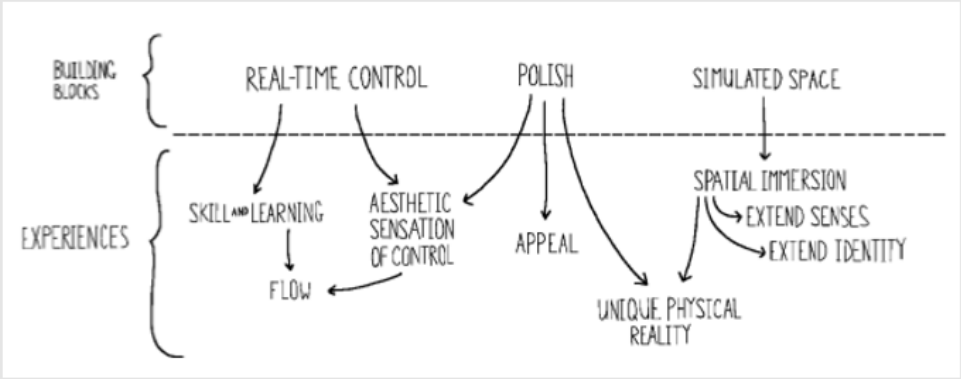
Experiences of Game Feel

- The aesthetic sensation of control
- The pleasure of learning, practicing and mastering a skill
- Extension of the senses
- Extension of identity
- Interaction with a unique physical reality within the game

Experiences of Game Feel



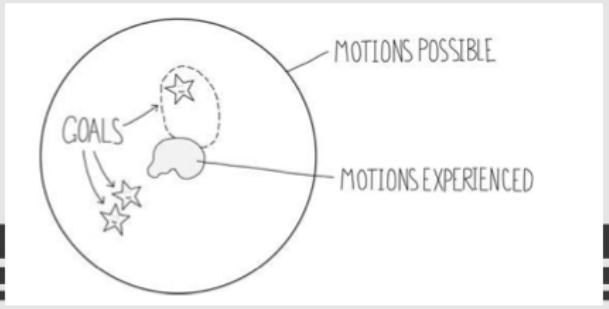
The Aesthetic Sensation of Control

- From pure input mapping to actual control is aesthetic

Joy of control. Can become boring without direction

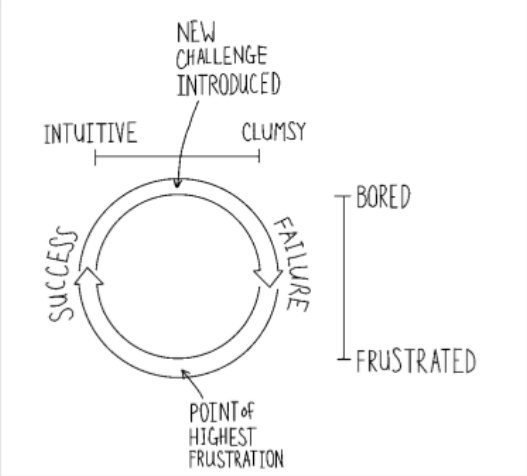
The pleasure of learning, practicing and mastering a skill

- with a specific goal to pursue, control takes on new meaning.
- Aimless, pleasurable motion is replaced by focused, purposeful attempts to complete the challenges presented.



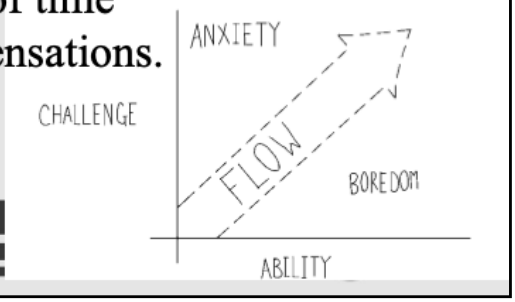
To keep engaging, must add challenges to leverage skill building. Iterate…

Game Feel Changes With Skill



Flow

- Flow theory says that when a challenge you undertake is very close in difficulty to your current level of ability, you will enter the flow state, which is characterized by:
- a loss of self-consciousness
- a distorted perception of time
- a host of pleasurable sensations.



Mihály Csíkszentmihályi (Mee High-ee Chick Sent Me High Yee) psychologist discovered flow

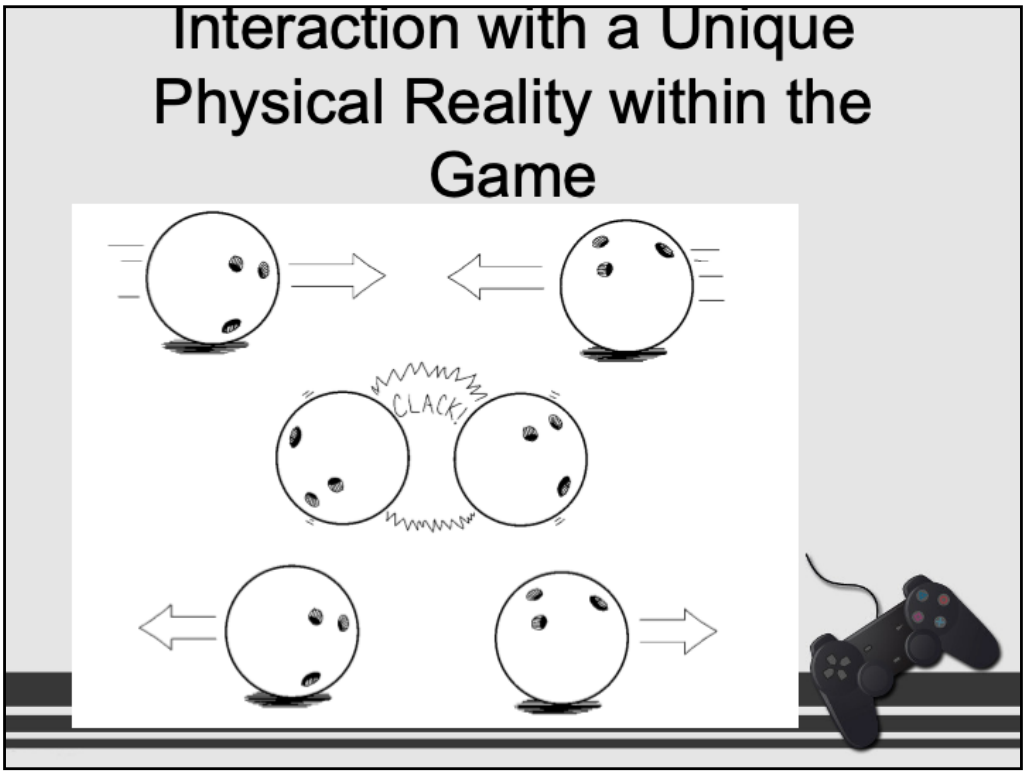
flOw: https://www.jenovachen.com/flowingames/flowing.htm

Extension of the Senses

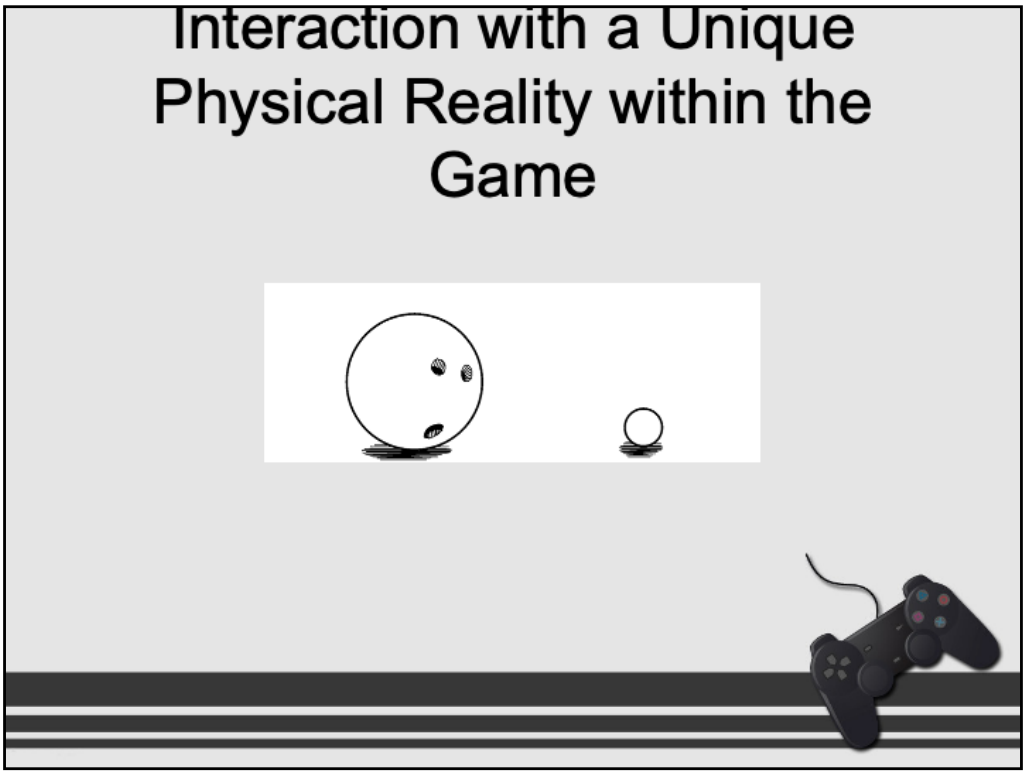
- To play a video game is often to focus intently on a screen, to the exclusion of all else.
- The screen becomes vision, speakers hearing and rumble motors the sense of touch.
- The feedback from these devices enables me to experience things in a game as if they were objects in my immediate physical reality.

Extension of Identity

- Driving a car, the car becomes an extension of you.
- When you crash its "You hit me!" rather than "His car hit me!" or "His car hit my car!"
- **"Proxied embodiment"**



Expectations with interaction



Informed expectations with changes such as bowling ball and ping pong ball

Meets game feel criteria

There are three primary types of mechanics in Street Fighter II: walking, attacking and jumping. The walking mechanic responds within 100ms when the joystick is moved left or right, and it allows a sustained correction cycle. Input is constantly accepted, the game responds within 100ms, and there is no lockout period. As soon as I perceive the result of my last action, I can adjust it with a new input. The movement mechanic has real-time control.

The “attack” mechanics—when the player presses one of the six attack buttons—have interrupted continuity. Pressing a button plays back an animation, which changes the shape of the avatar. The response time when the button is pressed is instantaneous, but then the player is locked out of further input until the animation is complete. For the “light” attacks, the duration is very short and will not interrupt the correction cycle of the walking mechanic. The heavy attacks can take almost one second to complete, however, disrupting the continuity of control. Either way, pressing a button to trigger an animation is not a continuous correction cycle. The attack mechanics do not have real-time control.

The jump mechanic adds upward force to the player when the joystick is pressed up. Once the jump has started, the player cannot alter the trajectory of the jump. This temporarily takes control away from the player, breaking the correction cycle of the

movement mechanic. After leaving the ground, however, the player can still trig- ger attacks. This mitigates the fact that the player's correction cycle is temporarily

APPLYING THE CRITERIA

71

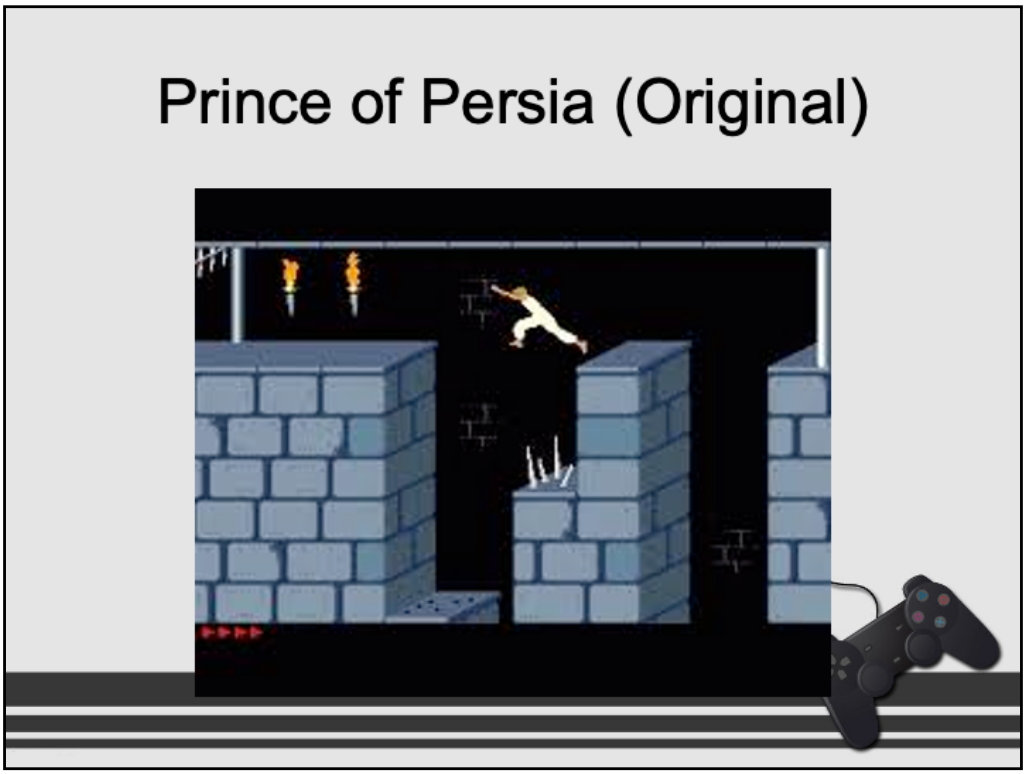
CHAPTER FOUR • MECHANICS OF GAME FEEL

FIGURE **4.2 StreetFighterIIhasgamefeel.**

broken, as does the fact that the player gets to choose when to start the jump. The player feels they have real-time control over everything. The whole system, combin- ing the movement, jumping and attack mechanics, has real-time control.

Street Fighter II also has simulated space. The characters collide with the ground, the edge of the screen and with each other. These interactions are perceived actively by the player, through the correction cycle of the movement mechanic.

Finally, the polish effects in Street Fighter II—the sounds, particle effects and animations—emphasize the interactions between objects in the game world.



Barely meets game feel criteria. RT control is limited due to nature of animations that block continuous character movement contro

The original Prince of Persia (see Figure 4.3) is an interesting edge case because of the disconnect between animation and control. The character moves fluidly, but the feel of control is stilted and uneven. A casual observer might assume that because the movement of the character is smooth and even, that the control must also be. This is not the case.

The individual mechanics in Prince of Persia are:

- Run
- Jump vertically
- Jump horizontally

72

F I G U R E **4.3 In Prince of Persia, animation reigns supreme.**

- Change direction
- Lower (down a ledge)
- Draw sword
- Sheathe sword

- Shuffle
- Parry
- Thrust
- Crouch
- Crouch-hop
- Walk
- Grab ledge
- Crouch-slide

Prince of Persia consists entirely of mechanics like the attack mechanic in Street Fighter II. The player presses a single button, and a single animation is played back. The response time is less than 100ms, but further input is locked out until the animation is over, which often breaks continuity. Examining individual movement mechanics by this criteria, we can see which ones have real-time control and which don't. For example, going from Stand to Run (Figure 4.4) fails one of our threshold tests:

It takes almost 900ms for the prince to go from standing still to a full speed run. In between, new input from the player is meaningless. There is a branch point of sorts; having reached the end of the "standing to run" animation, if the directional

APPLYING THE CRITERIA

73

CHAPTER FOUR • MECHANICS OF GAME FEEL

FIGURE **4.4 Sixteenframesat30fps0.53secondstocompletetheanimation.**

FIGURE **4.5**
Thehoppinganimationtakesonly150mstocomplete,soitfeelsalmostrealtime.

button is still held down, the prince goes into his full speed run cycle. If the button is not held down, the "run to standing" animation is played back, taking another few hundred milliseconds. This is not an unbroken correction cycle, so this particu- lar mechanic by itself does not have real-time control.

Only the crouching mechanic, comprised of the fewest number frames, has real- time control. Because the user is locked out for a very short amount of time, the action not only feels instantaneous in response, but it feels as though it's ready to accept new input as soon as the player is ready to offer it. It's no wonder, then, that this is the mechanic of choice to use when precision timing is necessary. When navigating through a room full of gnashing blades, you want to use the crouch-hop mechanic (Figure 4.5). It feels like the most precise and responsive expression of your input and enables the smallest increments of movement spatially.

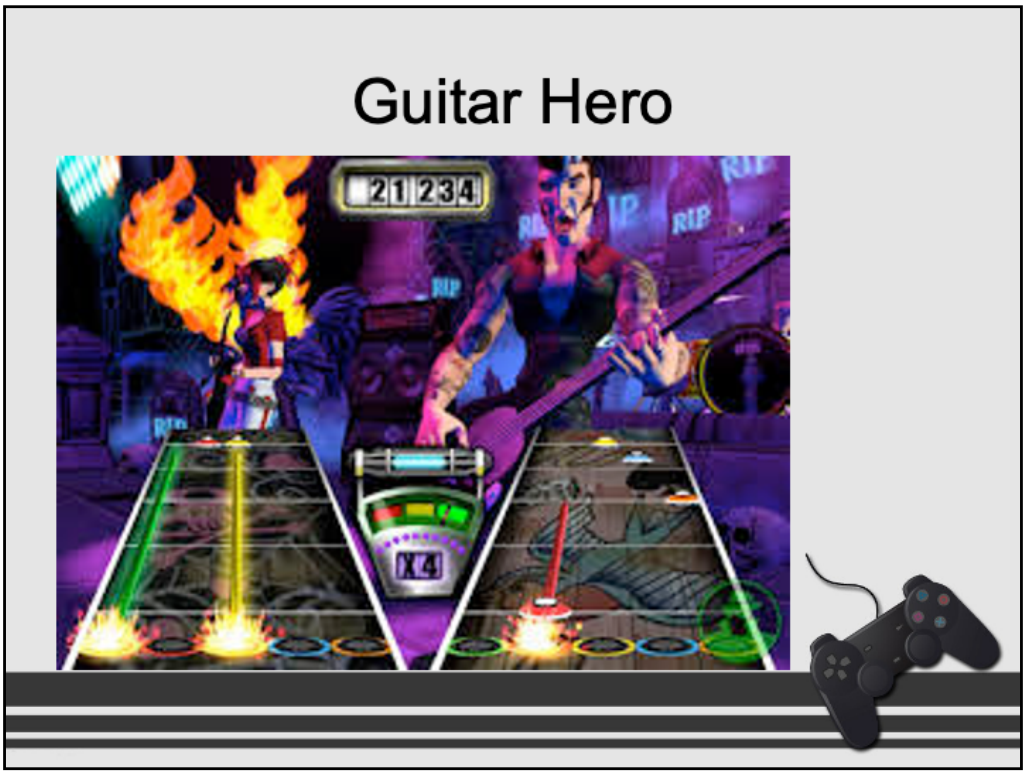
Out of all the mechanics of Prince of Persia, only one passes our threshold tests for real-time control. But the animation is fluid and appealing and covers up the lack of control to some degree. The player rarely has a sustained correction cycle and so rarely experiences true game feel. The fact that there are interactive branch points in the animations helps to some degree. In this case, unpredictability actu- ally works in the game's favor. I don't know exactly when the jump is going to take place, so I instinctively just hold the up button when I'm close to where I want to jump. This makes me feel as though the system is listening to my input more often than it is.

74

FIGURE **4.6 PrinceofPersiahasgamefeel,butit'sprettystilted.**

There is simulated space in Prince of Persia; animations can be interrupted when the character walks far enough off a ledge, and he can bump into walls. The player experiences these directly and actively, by pushing the character into them. The only polish effects that emphasize these interactions are the animations, which have a good sense of weight and presence against the floor.

So Prince of Persia has game feel, but just barely. The player is able to cobble together a correction cycle by imagining control when there is none and by using the mechanics with the lowest number of frames whenever possible.



NOT Game feel: no spatial simulation and **no player controlled game object with continuous flow of input and response, no correction cycle**

Ahh, Guitar Hero. What a lovely game. It's rare to see technology infused with such a sneer, such sense of unabashed glee. In the Game Developer post mortem of the game, producers Greg LoPiccolo and Daniel Sussman name the one litmus test for every feature and piece of content in the game: "Does it rock?" The results of this simple vision speak for themselves. But does Guitar Hero have game feel as we've defined it? Again, let's examine the individual mechanics and the system as a whole.

APPLYING THE CRITERIA

75

CHAPTER FOUR • MECHANICS OF GAME FEEL

In Guitar Hero, there are five things you can do (mechanics):

- Strum
- Whammy
- Hammer On

- Hammer Off
- Tilt

The strum is the game's core mechanic (Figure 4.7). Colored notes scroll down from the top of the screen. You hold down one or more corresponding buttons on the neck of the plastic guitar and pull the strum trigger up or down. If you strum the right combination of notes at the right time (when the note's position is close enough to crossing the line) the game records the note as hit. More notes hit means a better score, and the game tracks streaks of hit notes. Miss too many notes and you fail the song.

Impression of motion, check. The notes seem to move down the screen, from top to bottom, and individual frames are fused into an impression of moving objects. Instantaneous response, check. The response time to input is within one perceptual processor cycle (less than 100ms) so the response from the system seems instantaneous with a strum. But there is no continuity. Instead of locking the player out as in Prince of Persia, it cuts the player off. The whole loop of input and response happens in less than 100ms, but once it's done it's done. **There is no continuous flow of input and response, no correction cycle.**

The whammy bar mechanic, however, allows a constant stream of both input and response. The response feels instantaneous and continuity is maintained. The whammy mechanic has the potential to be an ongoing correction cycle. But there

FIGURE **4.7 The"strum"mechanicinGuitarHero.**

76

is no simulated space. The waveform ripples and notes bend as the whammy bar is manipulated, but the size of the ripples has no meaning. Bending notes with the whammy mechanic does not enable the player to actively perceive a simulated space because there is no simulated space around it to interact with (Figure 4.8).

F I G U R E **4.8 Bending the waveforms with the whammy mechanic is real-time control, but it lacks spatial simulation.**

FIGURE **4.9 GuitarHerohaspolishand(occasional)real-timecontrol,butnosimulatedspace.**

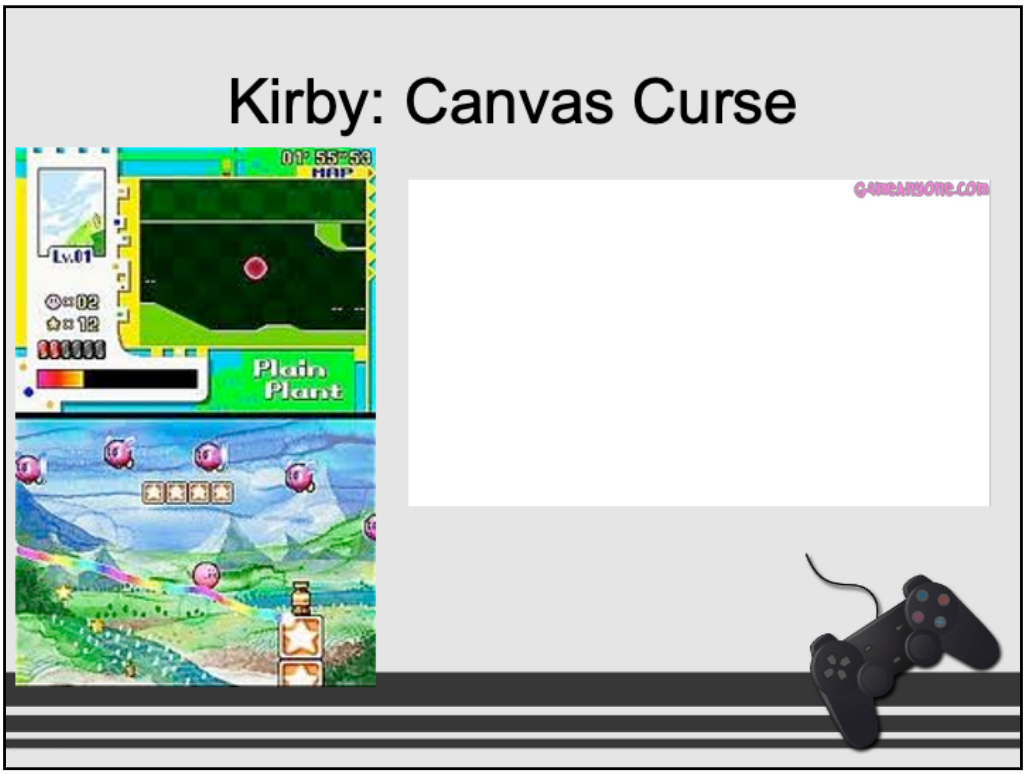
APPLYING THE CRITERIA

77

CHAPTER FOUR • MECHANICS OF GAME FEEL

Guitar Hero is a relatively simple game. Strumming to hit notes in increasingly difficult patterns that are synched to songs is the vast majority of the game. Even considered as a whole system, however, it does not have the property we've defined as game feel. The notes may fly fast and furious, and you can wail on the whammy and tilt to use your star power, but there is no unbroken flow of action, perception and

contemplation. There is the impression of motion, instantaneous response, but there no sustained correction cycle and no spatial simulation (Figure 4.9).



https://www.youtube.com/watch?v=Rwa-5szOrXs

NOT Game Feel: Interaction within simulated space not directly perceived

Manipulating spatial constructs that are independent of the player game object (character). Analagous to a click point in an RTS. Control is indirect, but not in the sense of an input action being abstract (e.g. 8-bit Zelda sword swing with a button versus Skyward Sword Zelda sword swing with Wiimote)

Kirby: Canvas Curse (Figure 4.10) takes a very simple idea and executes on it brilliantly, enabling the player to indirectly control Kirby's movement by drawing. In Canvas Curse, you play as Kirby and as a disembodied paintbrush at the same time. There are three mechanics:

- **Drawing (paintbrush)**
- **Tapping (on the avatar)**
- **Holding (enemies)**

Using the paintbrush mechanic, you draw lines on the screen, represented by flowing rainbows. If Kirby comes into contact with these lines he will follow their path in the direction they were drawn (see Figure 4.11).

From the moment the player starts drawing the line, they're running a correction cycle to get the line drawn in the shape and direction they want. The response is instantaneous, but this is not real-time control per our definition. In this case, the DS stylus and screen are functioning the same way a piece of paper and pencil do.

F I G U R E **4.10 The layout of Canvas Curse.**

78

The player is correcting the movement of his or her own hand in space rather than a virtual object in virtual space.

The other main mechanic is tapping. The player can tap Kirby directly with the stylus. This results in a state change and a speed boost. The spinning anima- tion is accompanied by a burst of speed in the direction Kirby is currently facing. The response is instantaneous, but, as with Guitar Hero, the input is not sustained.

F I G U R E **4.11 As you draw the rainbow trail, Kirby will follow its path if he makes contact with any part of the trail.**

FIGURE **4.12 CanvasCursehaspolishandsimulatedspace,butnosustainedreal-timecontrol.**

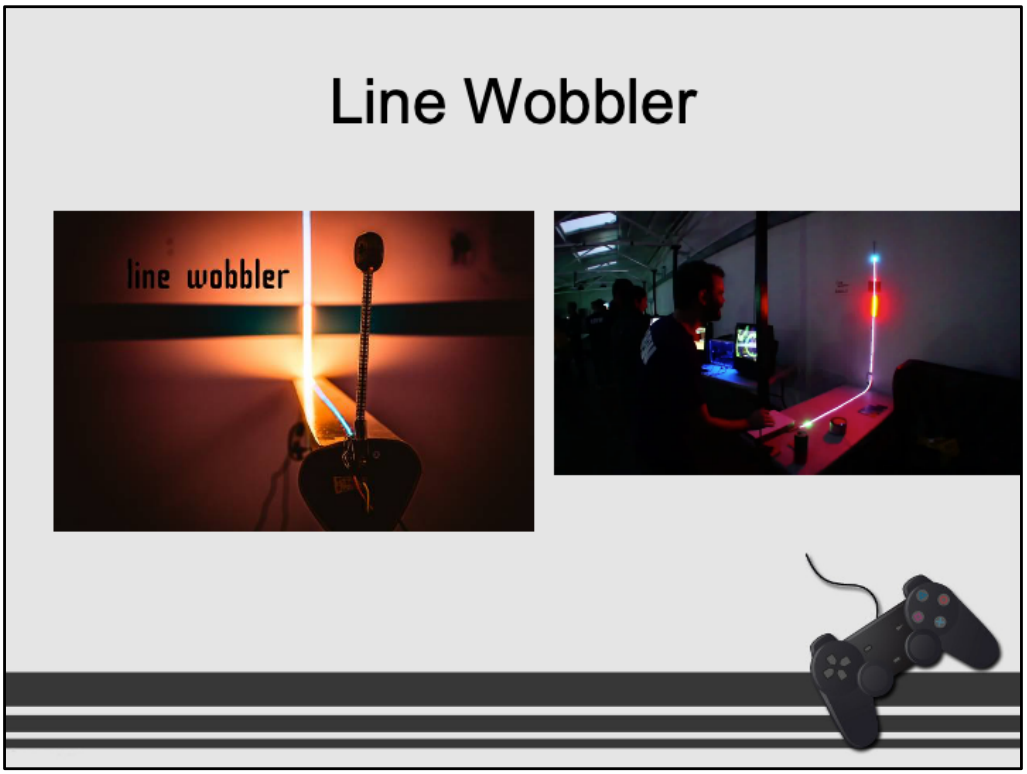
APPLYING THE CRITERIA

79

CHAPTER FOUR • MECHANICS OF GAME FEEL

One tap equals one input. To express a new input, the player has to lift the stylus off the screen and tap again. This is not an ongoing correction cycle.

The ambiguity of Canvas Curse is in its simulation. Kirby moves around a sim- ulated space, colliding with walls, enemies and other objects. Those interactions are emphasized with polish effects like sounds and particles. This is where things become fuzzy; Kirby interacts with simulated space in just the way it should to fall inside our definition of game feel. The world of Canvas is its own unique physical world. **But the player does not experience the simulated space directly**, perceiving it actively via Kirby's "body" in virtual space. Instead, the player guides Kirby indi- rectly, observing the results of his interactions and building a model of the game world from those interactions. Kirby: Canvas Curse falls outside the definition of game feel (Figure 4.12).



http://wobblylabs.com/projects/wobbler

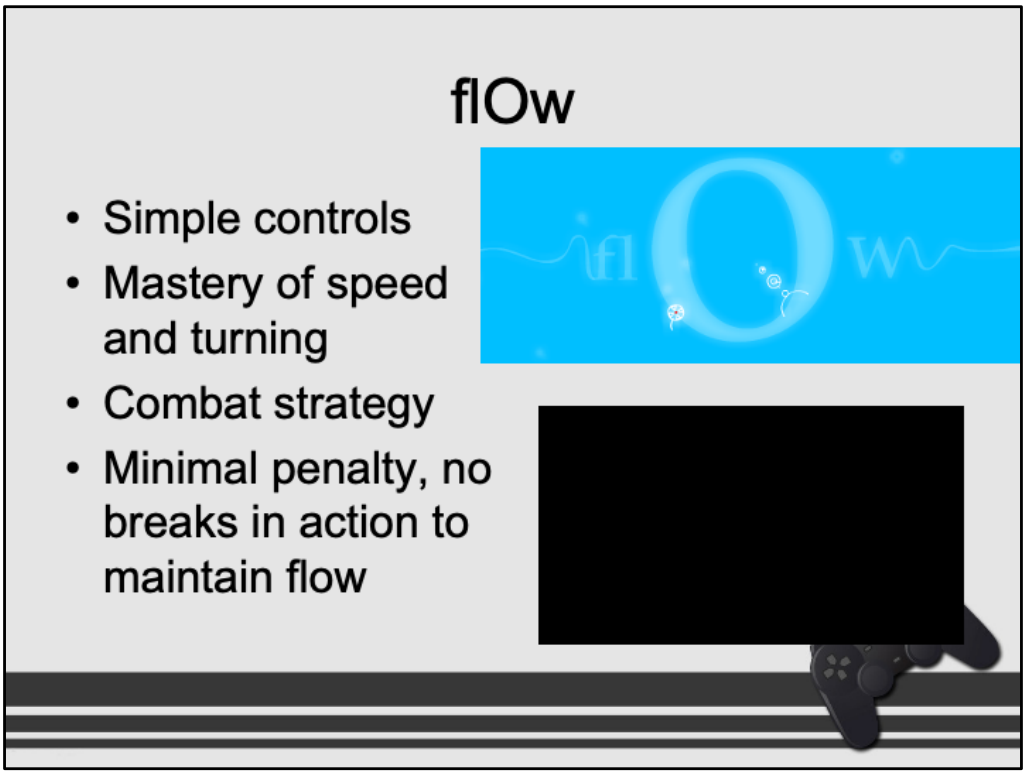
https://www.youtube.com/watch?v=UZ_5ol_kyL4

Is Game Feel

Real-time control

Simulated space, player moves avatar dot back and forth and interacts with game objects

Colorful lights, animated sequences, sound effects



flOw: https://www.jenovachen.com/flowingames/flowing.htm

https://www.youtube.com/watch?v=9pRBptP3i1Q

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