

Speedrunning Glitch Hunting



Tricks to find Tricks & Tips to find Skips



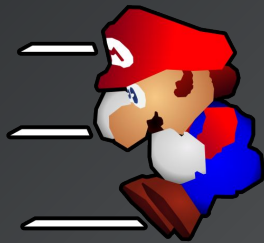
By Auride (<https://auride.love>), Ashley93oBTW (<https://www.twitch.tv/ashley93obtw>),
aloyark (<https://www.twitch.tv/aloyarkk/>), WitherMin (<https://www.twitch.tv/withermin>), and
Waezone (<https://www.twitch.tv/waezone>)



Speed Science

- All runs have tech.
 - Glitches
 - Skips
 - Tricks
 - Strats
 - Exploits
 - Setups
 - Mechanics
 - Cheese
- **BUT HOW DO THESE PEOPLE FIND THIS STUFF???**



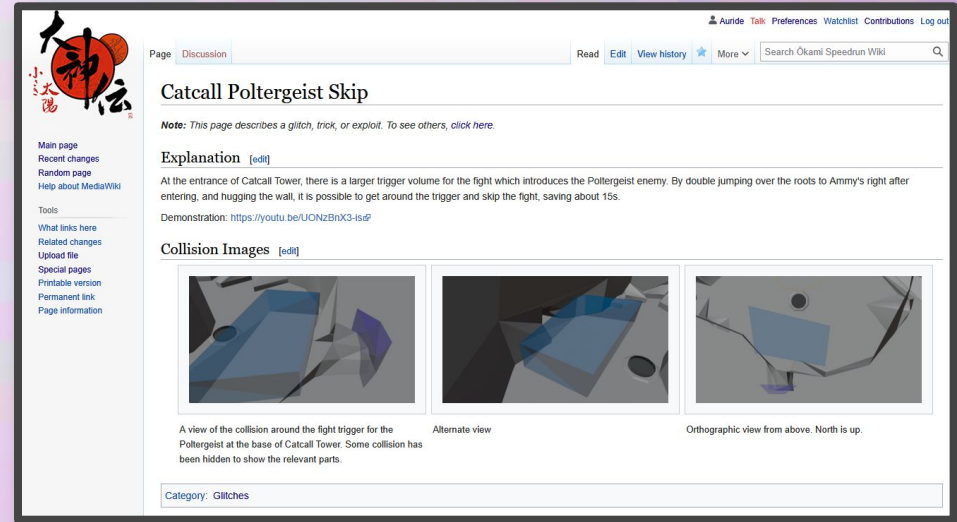


Where to start?



Prior Art

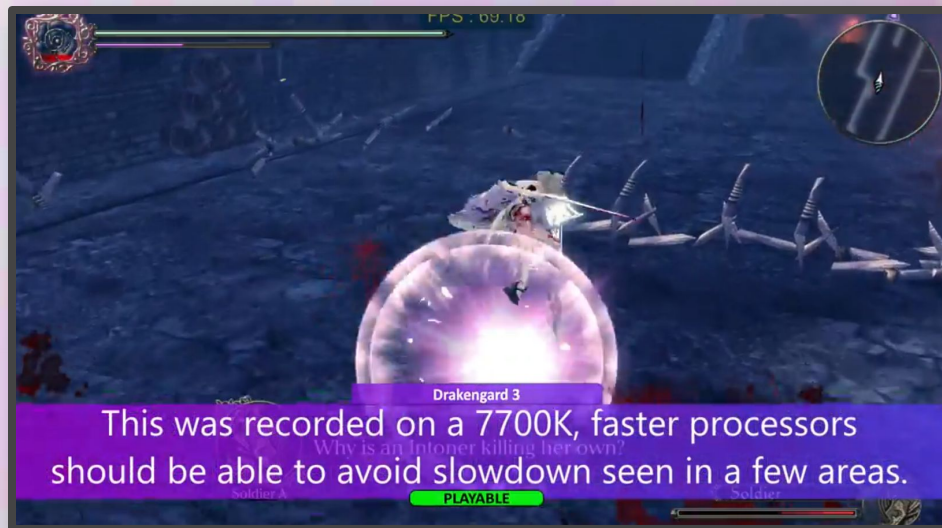
- Understand what's already known.
- Talk to existing community members.
- Find, create, and improve resources:
 - [Wikis](#)
 - [Text guides](#)
 - [Videos](#)
 - [Tools](#)
 - [Data](#)
 - [Collision visualizations](#)
- Explore related communities around the game (e.g. modding)
- **Always ask questions.**

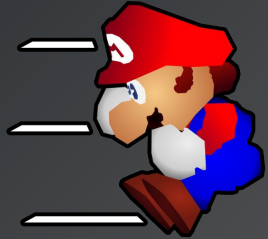




Prior Art – Replication and Testing

- Don't assume community knowledge is gospel.
- Try everything yourself.
- Retime routes and strats.
- Example: DoD3 Jump Dash Lights
 - Tech was known since 2020
<https://youtu.be/wGLxIO1lauA?t=19>
 - Wasn't tested to see if it was faster until 2021
 - **~30% faster**
https://youtu.be/DIC7_EA5ST8



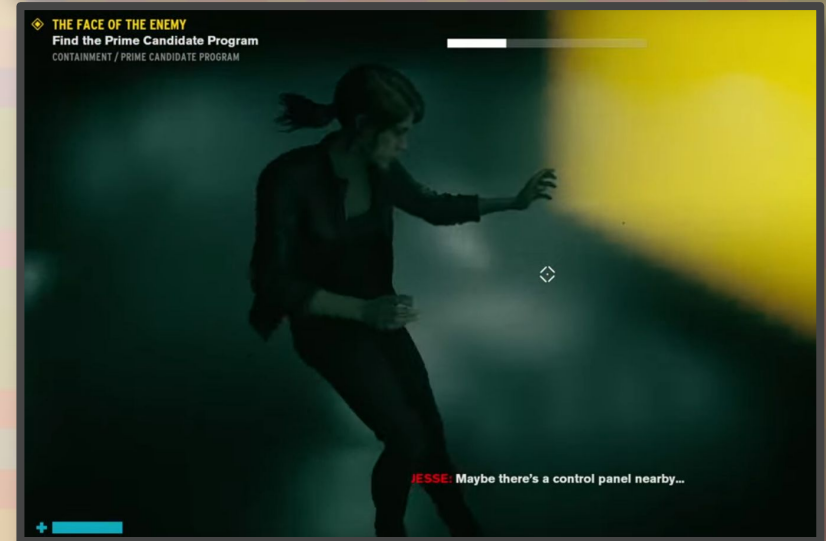


Methodology



New Physics

- Study poorly understood phenomena.
- Explore the edge of what's known.
- Take it to the limit.
- Example - Okami NG - D Boost
 - Poorly understood: https://youtu.be/_mglI8rAlkU
<https://youtu.be/XaulMp9UMMM>
 - New examples expand horizons:
<https://youtu.be/-z01DiUm4xQ>
<https://youtu.be/Hro65moK-SM>
 - Useful applications discovered:
<https://youtu.be/i5hu-vo7mr0>
https://youtu.be/EvGgEN2_3Cw?t=5334
<https://youtu.be/qjFbOdZzRUw>
<https://youtu.be/yYi2yXQulAY>
- Example - Control - Shieldy McSoary
 - Discovered by accident:
<https://clips.twitch.tv/DarkObeseChickenOSfrog>
<https://clips.twitch.tv/BrainyArbitraryWormKAPOW>
<https://clips.twitch.tv/ModernCautiousAnthHumbleLife>
<https://www.twitch.tv/bryonato/clip/MotionlessCovertPizzaHeyGirl>
 - Discarded as being niche/unviable tech
 - Later discoveries made it the most iconic glitch in the run:
<https://youtu.be/39sivP8ezhU>
<https://youtu.be/BI78NK84TMk?t=1848>





The Engineering Method

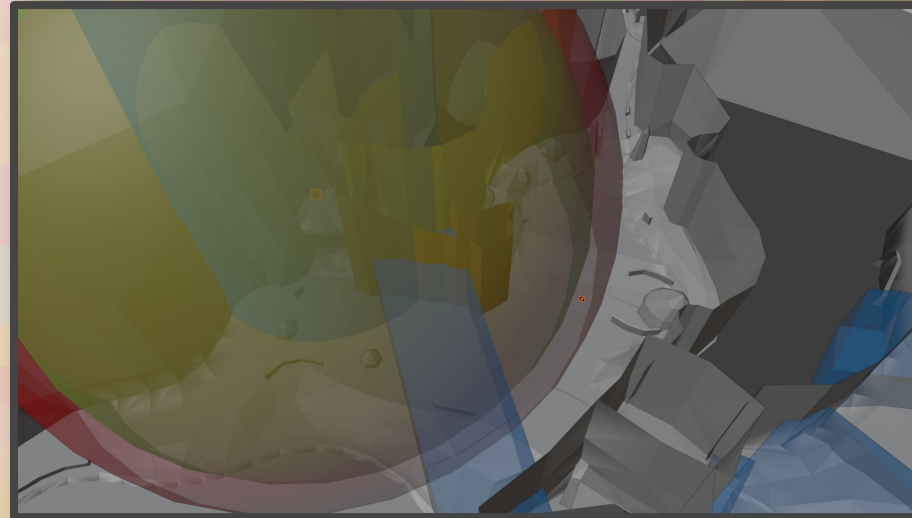
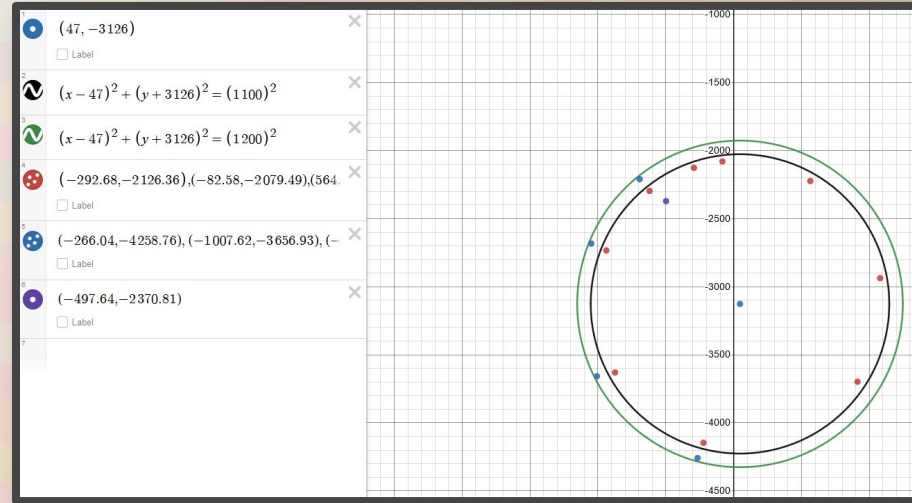
- Look for solutions where you have problems.
- Determine what's needed.
- Explore all available tools and techniques.
- Attempt every variation until success is achieved (or you give up).
- Optimise.
- Example: Okami - Oni Island Floor 1 Skip
 - Problem: Labyrinth is slow <https://youtu.be/sRRZ9lDqdBI?t=6346>
 - Technique: Corner Skew + Unskew Boost <https://www.twitch.tv/videos/84809002>
 - Solution: <https://youtu.be/au0eUIN0Zb8>
 - Optimization: <https://youtu.be/hGdGvpu6aFY>
- Example: NieR Replicant v1.22 - Flyers Skip
 - Problem: Flyers are slow <https://youtu.be/l5bbIJt9nss?t=2832>
 - Technique: Infinite height + triggers extend infinitely downward
 - Solution: <https://youtu.be/5rq95nr1ZrQ>





The Scientific Method

- Choose a target to study
- Form a hypothesis
- Break out every tool of analysis
 - Reverse engineering
 - Data collection - memory watching
 - Asset dumping - collision visualization
 - Frame-by-frame analysis
- Example - Okami NG - Igloo Turtle Skip
 - Target of study: <https://youtu.be/k88UtutOe3g>
 - Incorrect hypothesis: <https://youtu.be/6FsajWiG7tE>
 - Studied in-depth, correct understanding: <https://youtu.be/XvcytZgzFCY>
- Example - Control - Wavedashing
 - First discovery: <https://youtu.be/DRaefCxi1VA>
 - <https://youtu.be/4StgWOqW7qA>
 - Viability was unclear
 - Developed CSRM tool to analyze speed & better refine understanding of technique <https://youtu.be/dDK7R-IIQ0Q?t=1074>





Serendipity

- Always pay attention to the unexpected.
- Cast a wide net - search the internet.
- Explore every facet.
- Document everything - a useless tool might eventually be the perfect fit.
- Capitalize on every opportunity.
- Example - Okami NG+ All Brushes Ezofuji Interior Clip
 - Lucky discovery: <https://youtu.be/pV43r3lj2A>
 - Inspired innovation: <https://www.twitch.tv/videos/2456860348?t=1h46m53s>
- Example - Half-Life 2 Bill's Big Thrill
 - Discovery: <https://www.twitch.tv/billthethrill/clip/SpeedyAltruisticMochaDoubleRainbow>
 - First application: <https://www.twitch.tv/videos/399359828?filter=highlights&sort=time>
 - Refined application: https://youtu.be/CBgo4WVG_3I?t=189





Serendipity (Cont.)

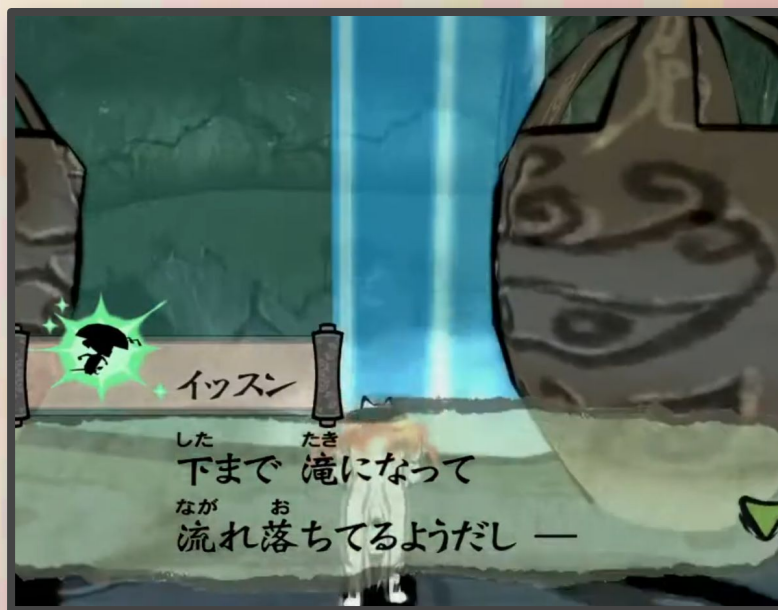
- Sonic Adventure - Death Cutscene Skip
 - Discovery: <https://youtu.be/9EKBfCYWtH4>
 - Application: <https://youtube.com/playlist?list=PLdYqUMnP-XFmfT2my6sPIbvESPV3NPdFd>





Synthesis

- Combine the tools and techniques you already know.
- Recontextualize old knowledge.
- Try what you one before looking for a new way past a roadblock.
- Two useless mechanics might have undiscovered synergy together.
- Example - Okami NG Pot Skip
 - Tech 1: Destroying invisible pots: <https://youtu.be/5Wjfv3Bg0-o>
 - Tech 2: Agata Bridge Skip: <https://youtu.be/nvs5ZGcrjvU?t=887>
 - Tech 3: City Checkpoint Skip: <https://youtu.be/AjZOtO869Fo>
 - Tech 4: Fireburst Early: <https://youtu.be/z7W-vSBu4jc>
 - Synthesis: https://youtu.be/Lla1W4_Qhxc

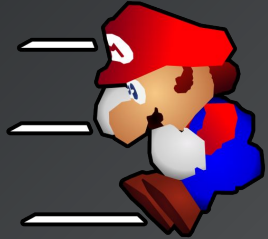




Synthesis (cont.)

- Example - DoD3 Shop Skip
 - Tech 1: Cool MovementTM:
<https://youtu.be/3KsspblrwYc>
 - Tech 2: Swap Cancel:
<https://youtu.be/iOIQoH3TXLQ>
 - Synthesis:
https://youtu.be/9ZEaprJ_XIQ?t=425





Universal Glitches



Universal Glitches

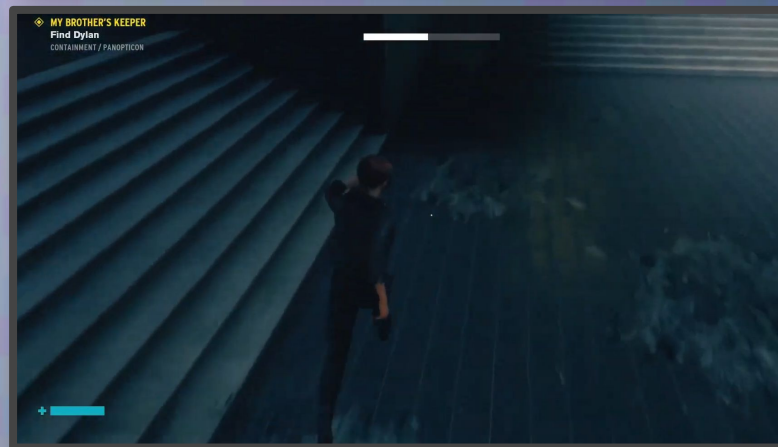
- All computers inherit the original sin.
- Many games have the same kind of glitches.
 - Certain programming or design errors are extremely common
 - Especially if they share the same engine
- Dialog Storage / Walking While Talking
 - Maintain control of your character during a state (e.g. dialog) which is supposed to revoke it.
 - Use stored dialog to cancel other events.
 - Okami - Half Blue Skip
 - <https://youtu.be/vPgBrd6l-g8?t=1308>
 - NieR Automata - EDS <https://youtu.be/YkSdJiASWjw>
 - Wind Waker - Double Storage
 - <https://youtu.be/T8tKL3ifkoc>
 - Sonic '06 - Mission Storage Credits Warp
 - https://youtu.be/zMaBVvGsf_o?t=723





Universal Glitches

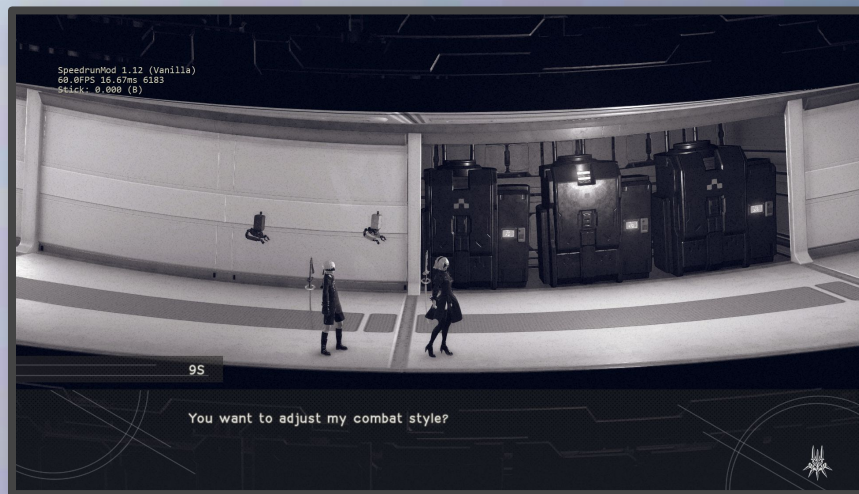
- Animation cancelling
 - Save time by ending player character or NPC animations early
- Examples:
 - Okami - Ground attack jump cancel
<https://youtu.be/xalpezqPB4c>
 - Control - Wavedash
<https://youtu.be/DRaefCxi1VA>
 - Jedi Academy - Saber Switching
<https://youtu.be/ScDYh12H0mY?t=30>
 - Star Wars: Republic Commando - Reload Cancelling
<https://youtu.be/4vL6RMUQfwY?t=4284>
 - NieR: Automata - Self Destruct (SD)
<https://youtu.be/pSp-msAFZII>





Universal Glitches

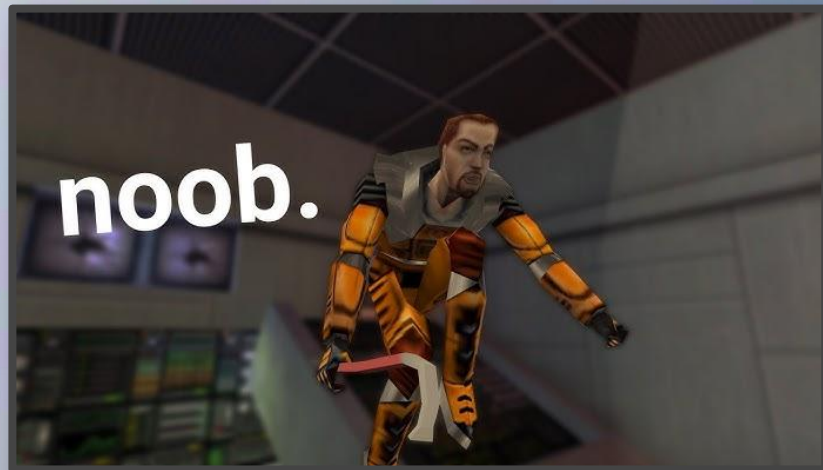
- Dialog cancelling
 - Save time by ending player character or NPC dialog early
- Examples:
 - Portal 2 - New dialog cancels old
<https://youtu.be/XIMb6QtBjBQ>
 - DoD3 - Octa Dialog Skip
https://youtu.be/9ZEaprJ_XIQ?t=2802
 - NieR Automata - Partner dialog cancel
<https://youtu.be/b9AOXeG2RVY>
 - NieR Automata - Mansplaining
<https://youtu.be/g8YQNvOubCg>





Universal Glitches

- Bunnyhopping / Bypassing friction
 - Avoid losing momentum
 - Maintain a state where the game doesn't apply friction.
- Examples
 - Half-Life 1 - Bunnyhopping
<https://youtu.be/cNTB4TQAts4?t=438>
 - Okami - Slope Hopping
<https://youtu.be/LbsXr0gHhtl?t=1607>
 - Ocarina of Time - Super Slide
<https://youtu.be/UffGaLgfh6Y>
 - Twilight Princess - Break Slide
<https://youtu.be/ivUBO2NV3uc?t=57>





Universal Glitches

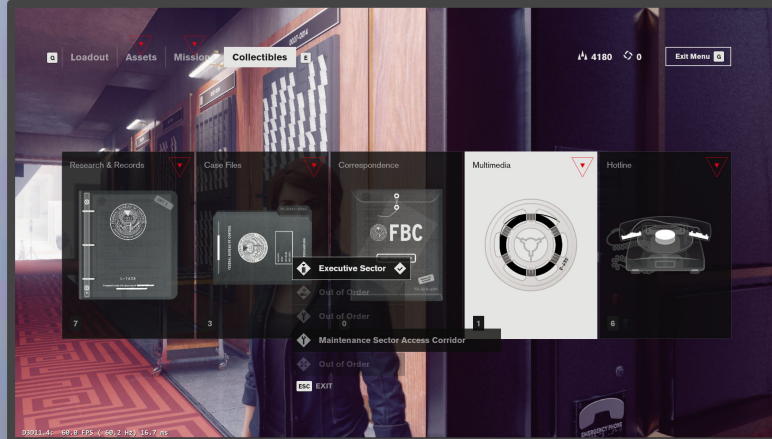
- Not limiting negative speed
 - Games often hard-cap forward velocity
 - A big negative number is still less than any positive number.
 - Programmers forget to use `Math.abs()`
 - Move in unexpected ways
- Examples:
 - Super Mario 64 - Backwards Long Jump
<https://youtu.be/a3QgV73-res>
 - Source Engine - ABH/ASH/AFH
<https://youtu.be/j2N0FJ0dhAw?t=75>
 - The Wind Waker - Superswimming
<https://youtu.be/kEF4ksaD9R4?t=13>





Universal Glitches

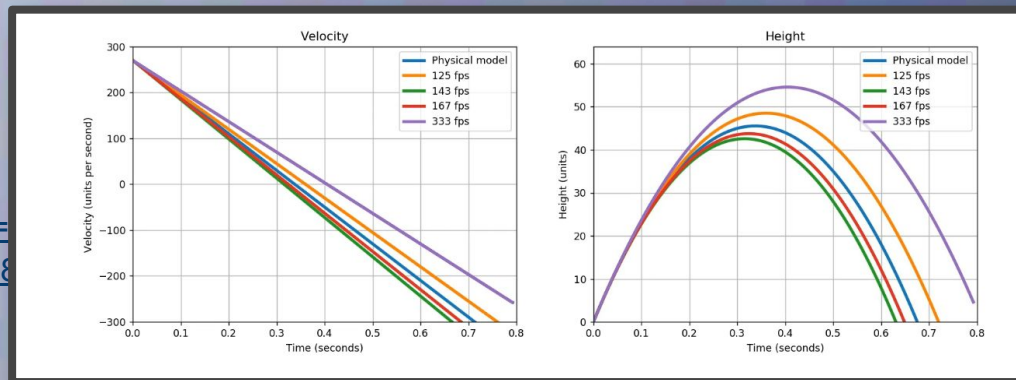
- Race conditions
 - 2 or more events on the same frame
 - Open 2 menus simultaneously
 - Start a process and then interfere with its completion
- Examples:
 - Ocarina of Time - Equip Swap
<https://youtu.be/UI2ipeV5npQ>
 - Control - Slidey McGunny
<https://youtu.be/dDK7R-IIQ0Q?t=858>
 - Skyward Sword - Back in Time
<https://youtu.be/ahoBmlhEg2k?t=21>
 - Super Mario World - Cloud Glitch
<https://youtu.be/Vf8FiktWIJ4>
 - Billy Hatcher - Super Clippen Yeet
<https://www.twitch.tv/videos/547591214?t=0h0m45s>
 - Sonic Adventure -
 - BoTW - Blight Skip <https://youtu.be/0KaX5dVFszk?t=1030>
 - Half-Life - Early Grenade
<https://youtu.be/cNTB4TQAts4?t=889>
 - Half-Life 2 - Yes Clip
https://youtu.be/CBgo4WVG_3I?t=586





Universal Glitches

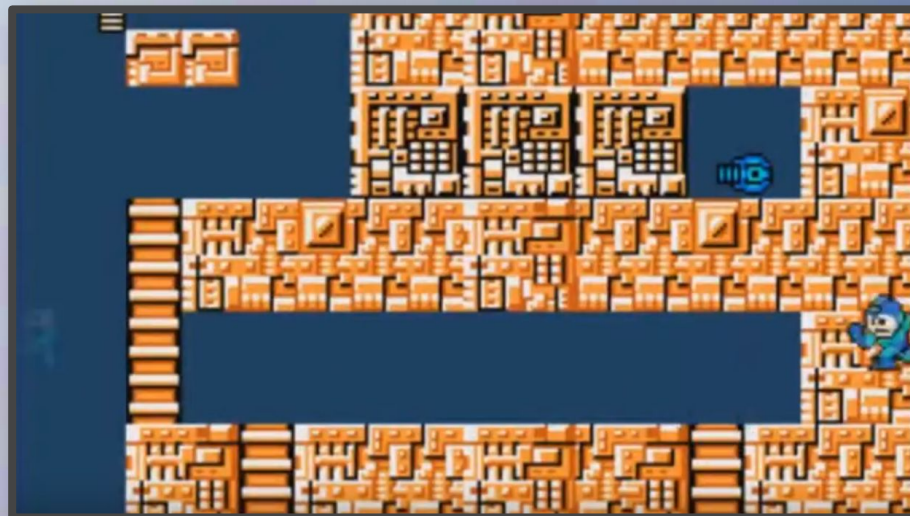
- Frame Rate-Dependent Physics
 - Many games have physics that assume a constant frame rate
 - Use a fast PC, limit FPS, or create excess lag to move faster, jump higher, and phase through walls.
- Examples
 - Indiana Jones and the Great Circle - Mantle
https://youtu.be/Yv8_HMpUY2U?t=1602
 - Quake 3 (& descendents)
 - Half-Life 1 - NPC Turning
<https://youtu.be/cNTB4TQAts4?t=59>
 - Resident Evil 2 REmake - Knifing
15 hits: https://youtu.be/_pPmek_c_OA?t=35
35 hits: <https://youtu.be/xAnefW0nLH4?t=8>
 - NieR Replicant - Ladder Clip
<https://youtu.be/e84SSkP7iNo>





Universal Glitches

- Zipping
 - In tile-based 2d games, collision will try to push the player out.
 - What if “out” is actually *in*?
- Examples
 - Megaman <https://youtu.be/bR3EZwHFANQ>
 - Super Mario World
<https://youtu.be/p7gKAYbn4Uw?t=404>
 - Sonic The Hedgehog
<https://youtu.be/PbLhU5BOUsc?t=66>
 - The Legend of Zelda: A Link to the Past
<https://youtu.be/WujTgBfvhfE?t=35>



SGDQ 2025, The Fake University of Speedrunning



Bachelor of Speed Science (BSS)

Thank you for watching!