

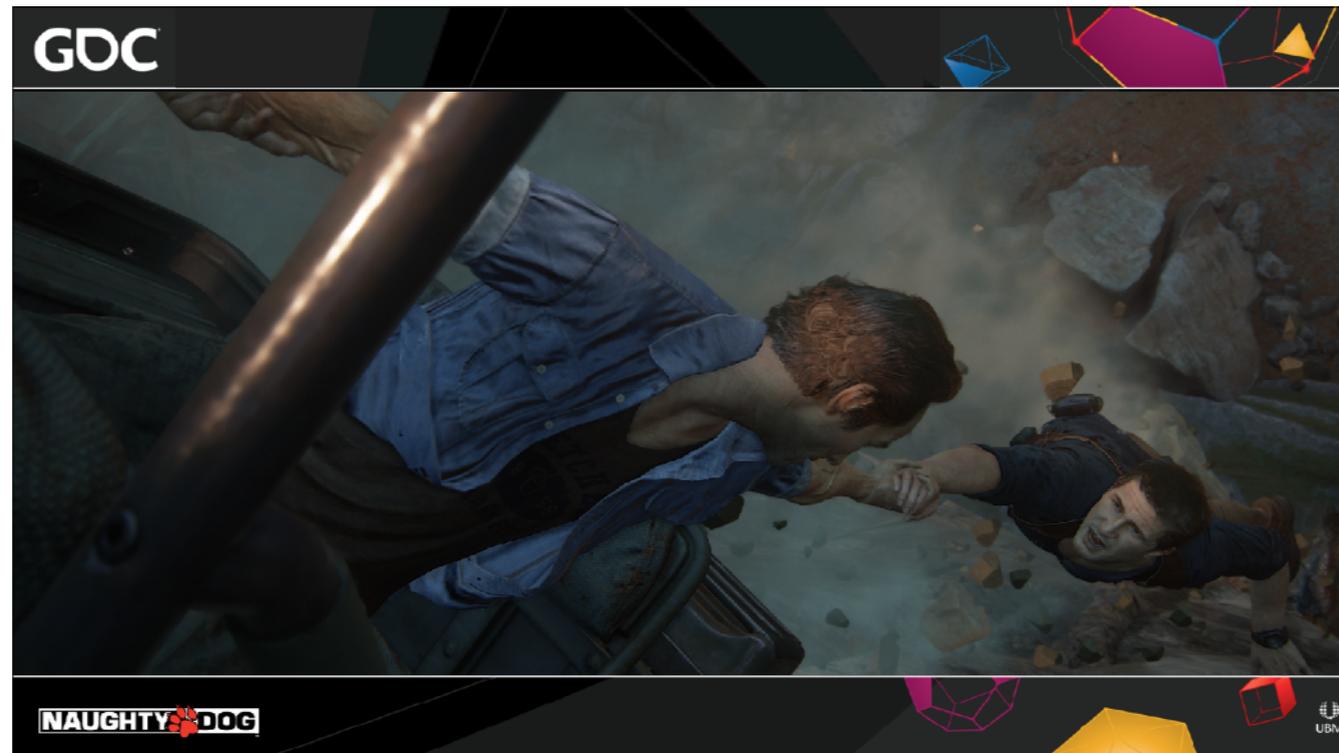


Good afternoon, and welcome to Realistic Performances in Games.

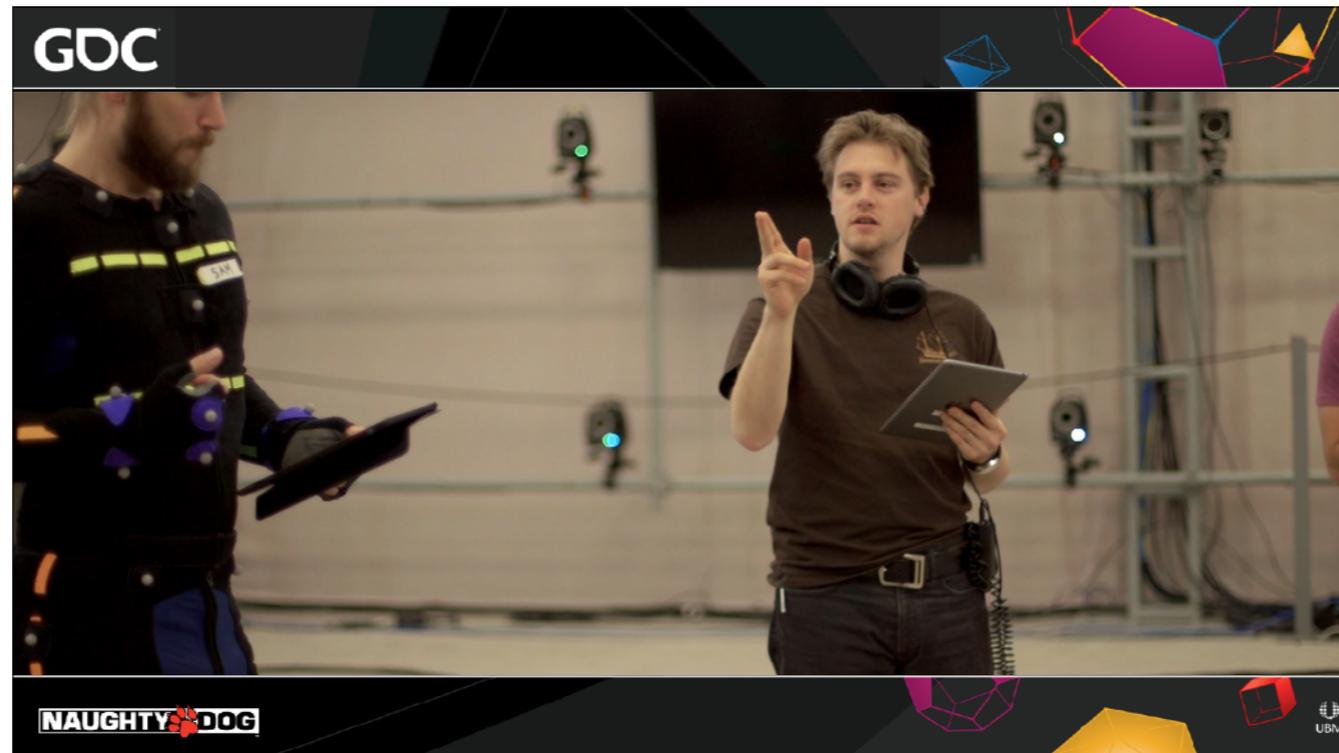
Fair warning, I've been told this talk is a bit "chewy", so...**STRAP IN!**



There's a perception out there that the average game is mindless entertainment, with at best a thin story, cardboard cutout characters and stilted acting.



But many companies have been working tirelessly against that stigma. At Naughty Dog, where I've been for over 7 years, we work hard to ensure our performances are believable, emotionally relevant to the Player, and blend with our gameplay as seamlessly as possible.



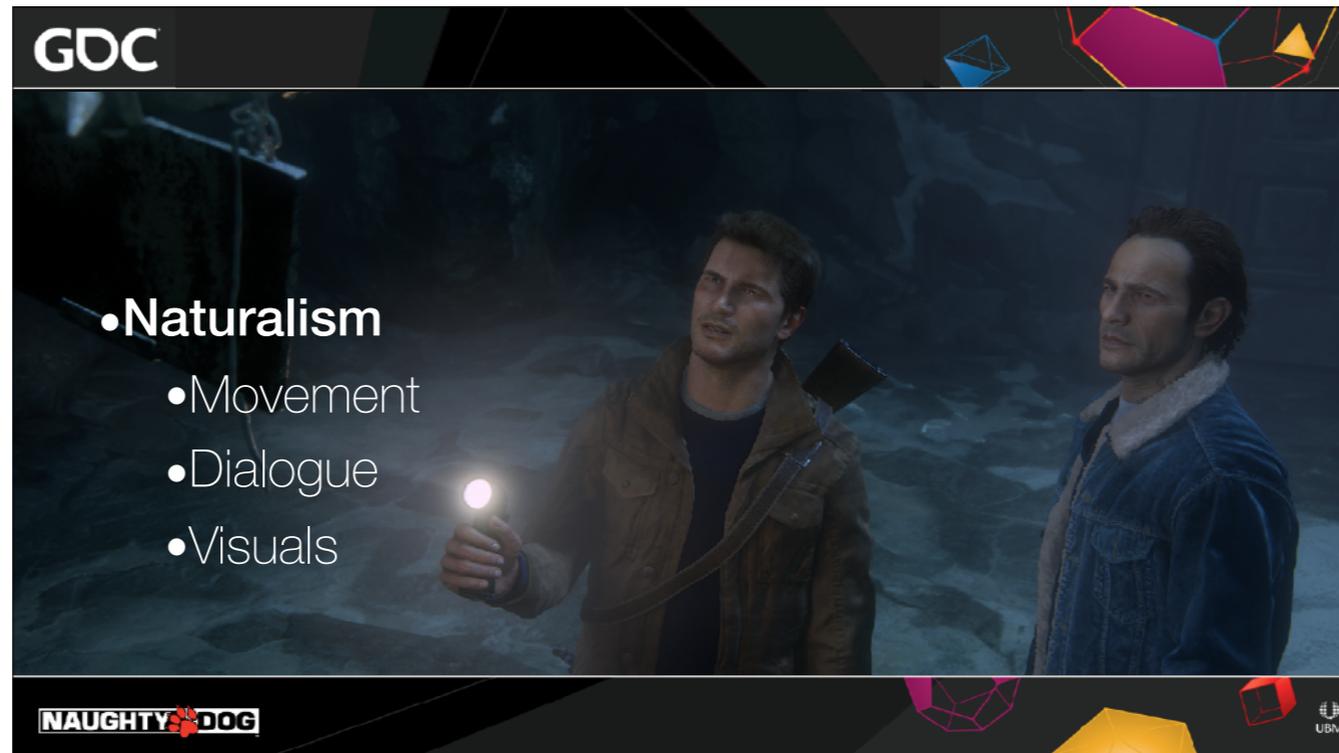
I'm Ryan James, and I work at Naughty Dog in a somewhat unique position—as Lead Editor. Aside from writing and directing some of our content, it's my job to help the rest of the team create and maintain performances that feel like what you'd expect from an edited movie—even when they're fully interactive.



But what makes a realistic performance?

{SLIDE}

At Naughty Dog, it means a character needs to feel **vulnerable**, **nuanced**, and **human**.



Which means we're often focused on how **NATURAL** every moment feels.

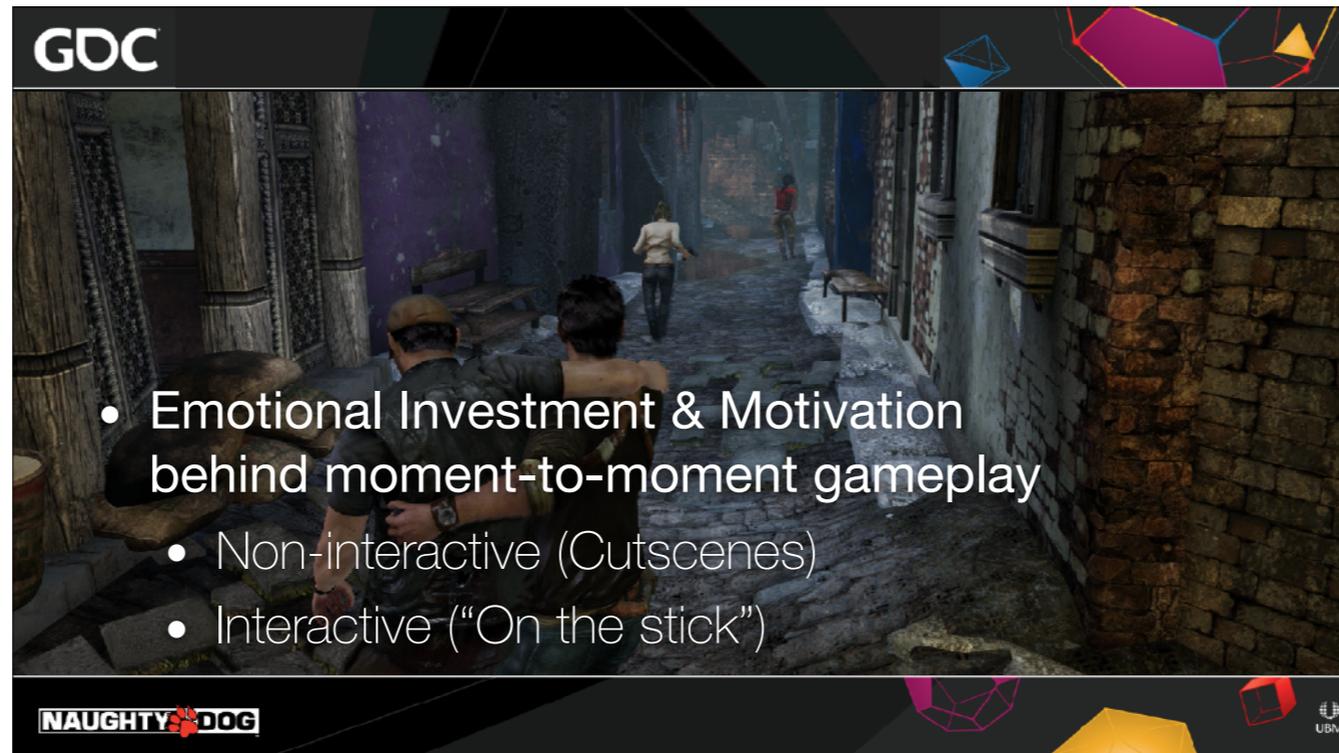
Meaning how the character **MOVES**, and how they **SPEAK**, needs to feel physically and emotionally relatable.

And of course, they also have to **LOOK** realistic—which takes labor from **everyone** to get right.



Which is our entire goal. Naughty Dog's games strive to intertwine story and gameplay, so the Player experiences a "*seamless*" performance, which we call the **ACTIVE CINEMATIC EXPERIENCE**.

{beat}

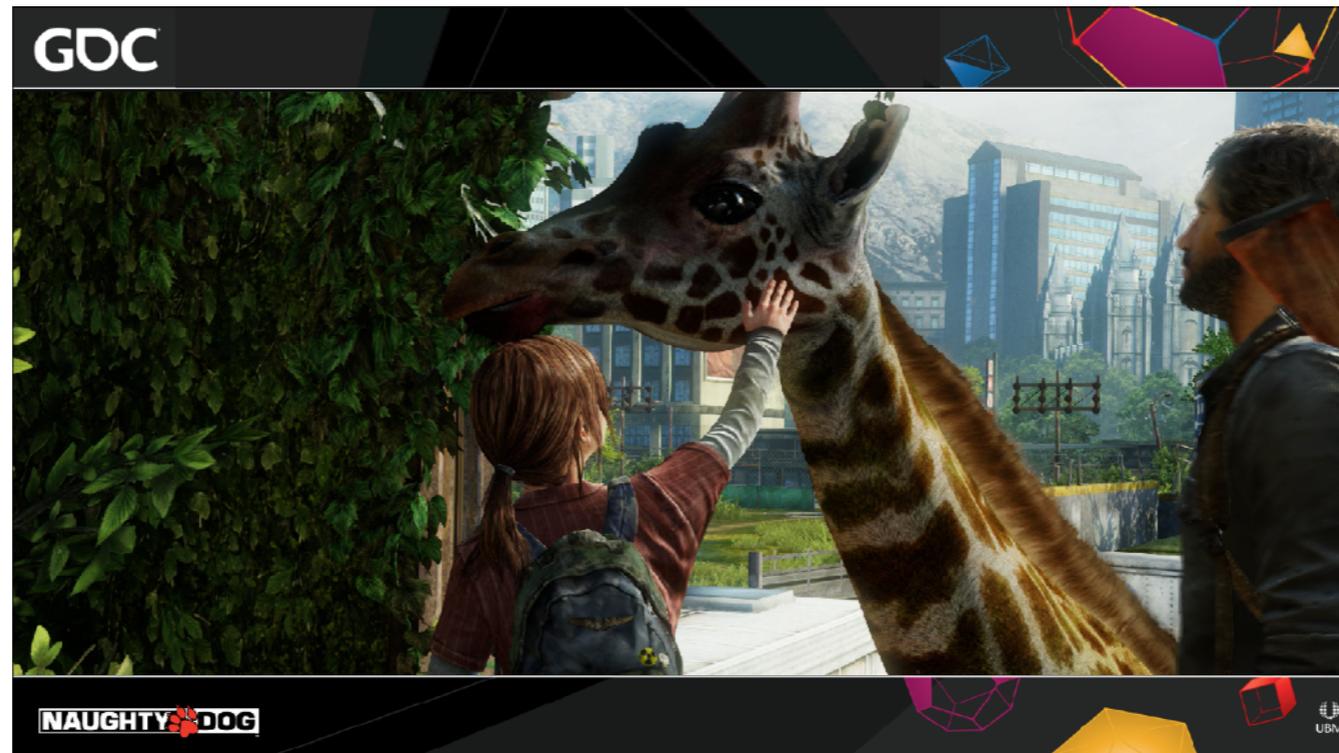


We like to provide the Player with EMOTIONAL INVESTMENT & MOTIVATION behind the moment-to-moment gameplay.

This is largely done through NON-INTERACTIVE CUTSCENES, but because we strive to keep the Player in control as often as possible, a lot of those drama and character moments end up paying off "ON THE STICK", as we call it.



But figuring out which beats belong where—and pulling off the execution of them—requires a lot of iteration. And at Naughty Dog, one of our biggest strengths is our **willingness to re-tool or even throw away content**—including captured performances—if it will make the Player's experience better.

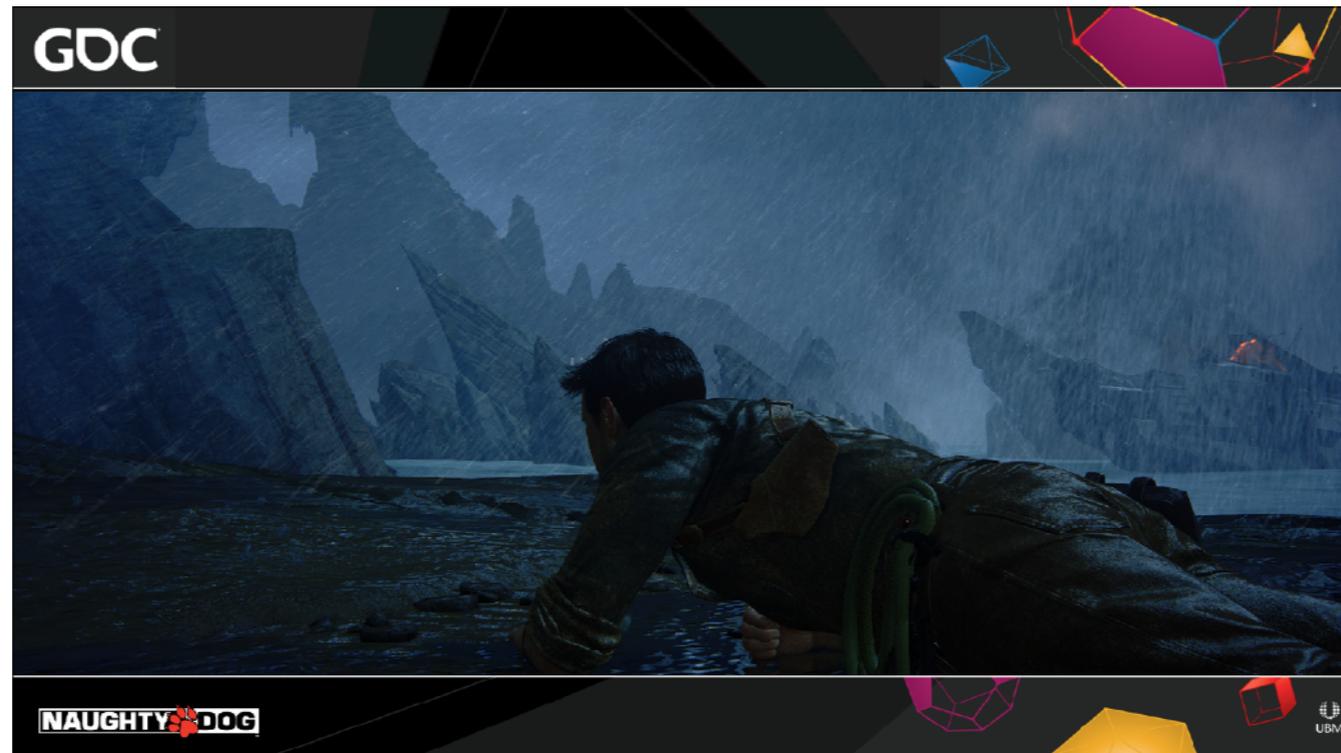


Even when deadlines are extremely tight, our company culture encourages people to speak up if they think something isn't working, and take advantage of our tools which enable quick alterations to try out new ideas.

That means **all of the narrative content that we capture is prone to changing**, even after it goes into the game. **And, sometimes these alterations happen so quickly that their trickle-down effects get lost in the daily shuffle.**



Thus it is up to the Editorial team to constantly **CHASE CHANGE**, tracking and managing each edited performance in its various evolutions over the course of development. In order to ensure that when the Player gets their hands on the game, our character's interactions still feel like the authentic, human moments we'd intended them to be when we first captured them.



So today I wanted to share some of the **techniques** we've used—and **challenges** we've encountered—when creating **realistic performances in games**, while allowing them to change over the course of development.



Oh, and just a heads up: SPOILER ALERT for several of our games.



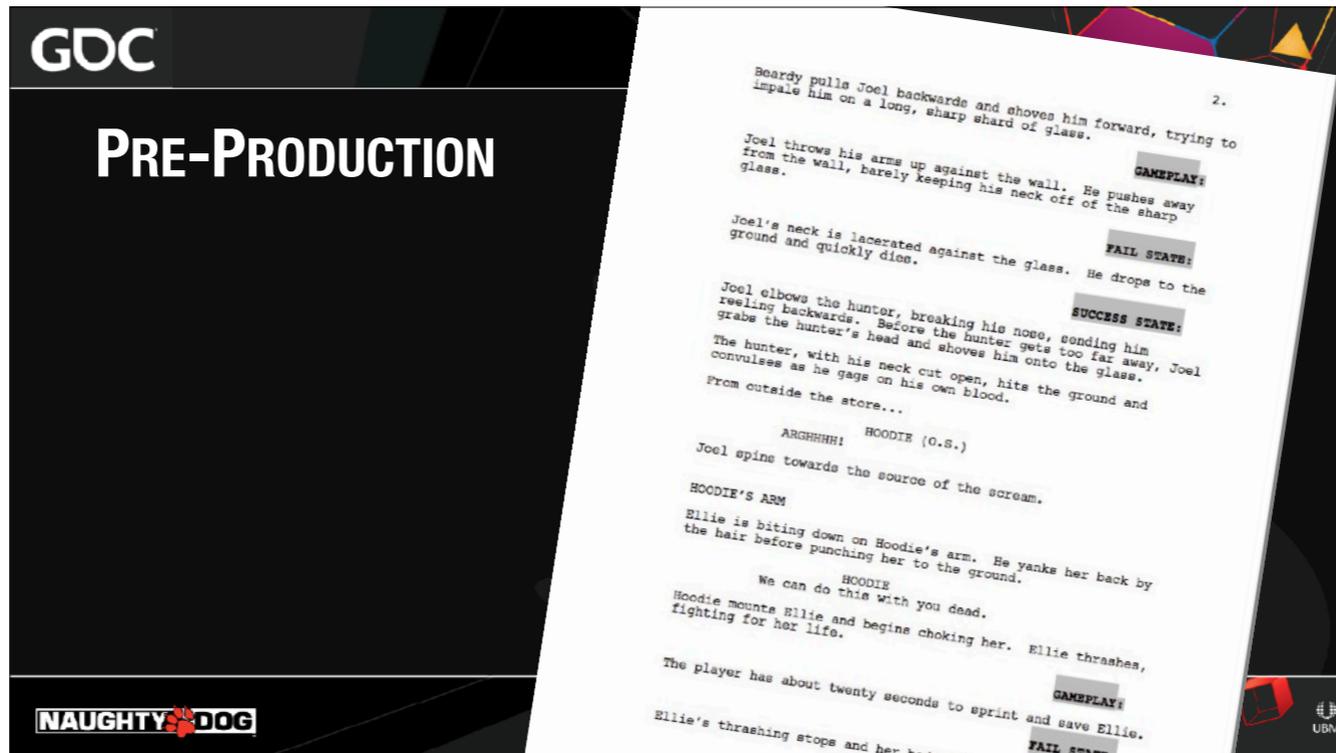
Here at Naughty Dog we don't develop the story second. Since we shoot and implement narrative material in small batches—capturing progressively with the Actors for easily a year or more—**our story in fact comes together right alongside Design.**

PRE-PRODUCTION



LEVEL 3	NARRATIVE MACRO BEATS	CHARACTERS	SET	Important questions
Orphanage	Nate is in the bed - with a black eye. He gets berated by a nun. She leaves the room, leaving him in a saddened state. A flash light hits the window. Nate spots Sam.	Kid-Nate, Kid-Sam, Nun		
break out	Nate escapes out of the orphanage, climbing on windows, roofs, walls.			
orphanage-entrance	Sam tells Nate he's saving. Nate is upset - Fe's unhappy at the end of the day.	Kid-Nate, Kid-Sam, Nun		
break out 2	Nate and Sam traverse out of the orphanage courtyard using Sam's Rope.			
orphanage-backtrack-out				
Prison		Prison Nate, Prison Sam		
		Prison Nate, Prison Rafe, Prison Sally		
	Rafe watches nervously	Prison Nate, Prison Rafe, Prison Sally		
	Good prisoners (got up the game you see?)	Prison Nate, Prison Rafe, Prison Sam		Can we support three character beats?
	cause of the gunshot, POV	Prison Nate, Prison Rafe, Prison Sam, Virgus		End brawl transition to here?
	is this a dark space and we. Nate and Nate along	Prison Nate, Prison Rafe, Prison Sam		
		Dive Nate		

Of course, it takes months of Pre-Production before we can shoot anything. Our directors and writers first juggle developing **Story Macros** with Design, overseeing the **creation of Characters** that offer varied gameplay mechanics, and **casting Actors** to embody those characters.



But as soon as we have enough material written, we jump in head first with our Actors to capture story beats via **motion-capture** and **dialogue recording**.

Often, we focus on a **Demo** of some kind: a small slice of the game that establishes our tone and explores the game's developing mechanics.

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PRE-PRODUCTION



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Right away, the game starts evolving because of these initial shoots. Not only do they help our principle Actors start infusing their personality into the characters, but their choices this early on allow the team to adapt to discoveries we've made with the Actors on stage.

PRE-PRODUCTION



- For instance, on the very first day of shooting *The Last of Us*, we began with a scene where Joel and Ellie are ambushed during their cross-country journey. Ellie was originally pulled from their pickup truck and pinned helplessly by an enemy, making her a quasi-damsel in distress for Joel to save.

{SLIDE}

But Ashley Johnson (who plays Ellie) had a desire to "fight back" against her attacker. So we shot it that way, leading our Directors to go back to Design and rethink the character's overall vulnerability over the rest of the game.

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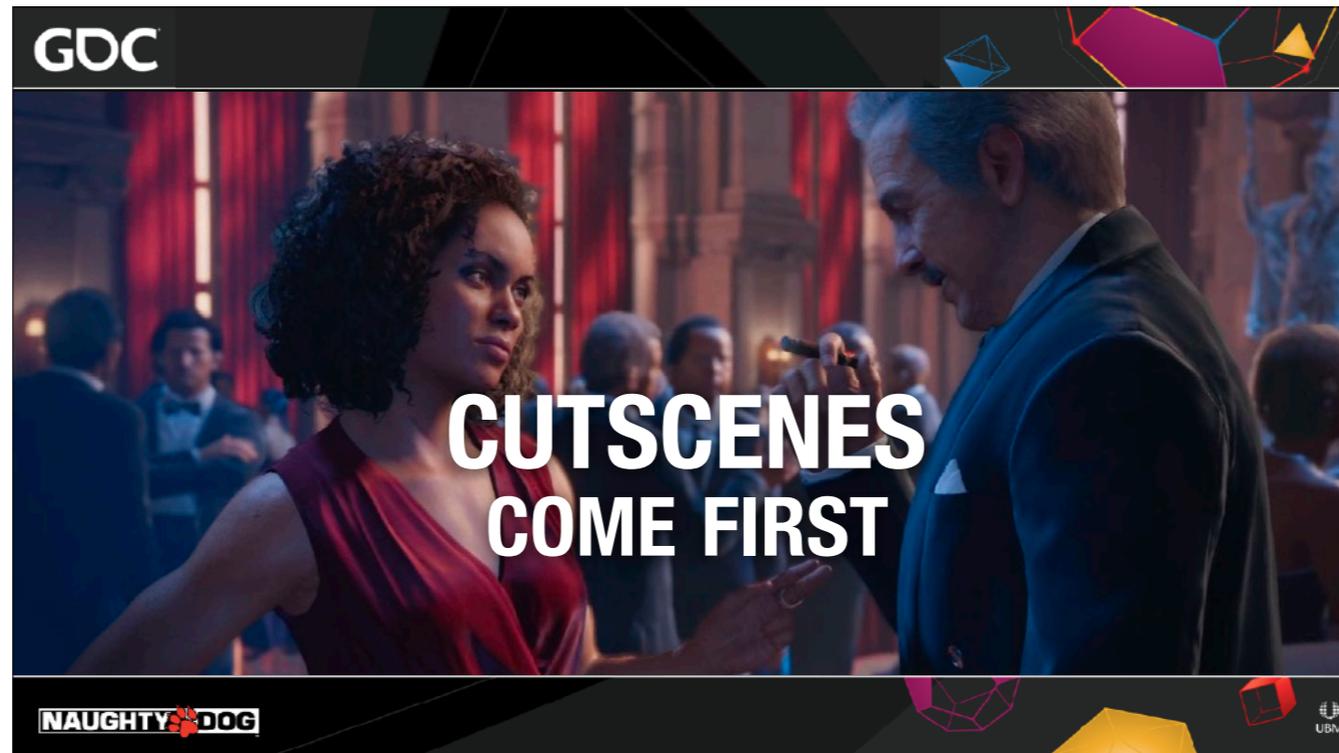
PRE-PRODUCTION



NAUGHTY DOG

UBM

Though we wanted to reinforce the need for the Player, as Joel, to protect Ellie from harm, it still worked better for her to become far more capable in combat situations than we'd originally conceived.



As we continue to shoot, **Cutscenes** are initially our top priority. Since these are **non-interactive beats**, reserved for the **more delicate emotional and character moments**, they require as much Animation time as possible to hit the high level of polish required.

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MOTION CAPTURE



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UBM

We've spoken about our capturing process before, but there's a couple things I feel we do that are essential to capturing the best performance possible. Because, as an Editor, if all I had to start working with was **stale or unnatural material**, there'd only be so much we could do in Post to make it better.

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MOTION CAPTURE



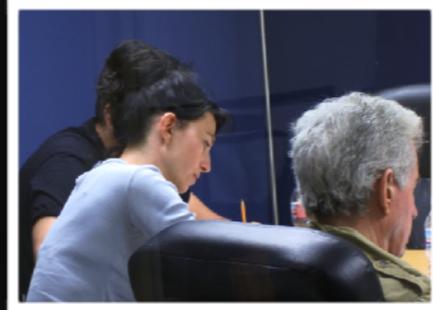
NAUGHTY DOG

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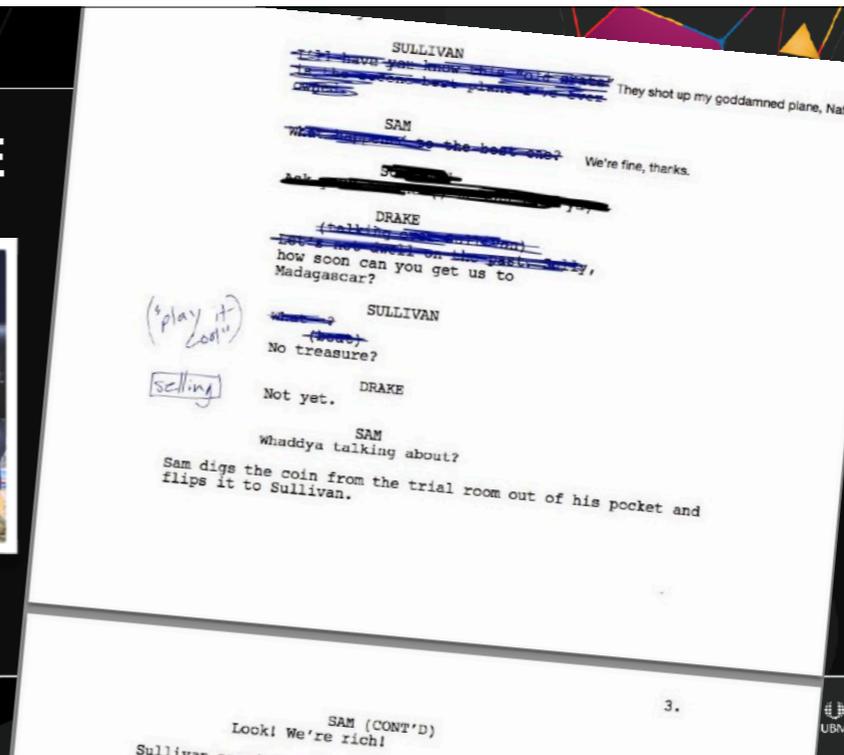
A lot goes into how we create scripts that give Actors honest material to play, but I sadly don't have time to touch on that today. However, I'd like to point out one strength in that process: **every phase the material passes through is a collaborative effort**. From the start, our Creative Directors encourage input from the team, and our Actors, either before a shoot or during our full-day rehearsals.

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MOTION CAPTURE



NAUGHTY DOG



Especially with our Actors. **We even do a table read to break down the script before we rehearse.** If something doesn't feel right, the Director and Actors work out what sounds the most natural and try that. Sometimes when we're shooting, we try a few variations of takes, and see what we like best in the Edit Bay later.

MOTION CAPTURE



When shooting a scene, we primarily capture it in one continuous take, unless we need to break it up for additional set builds or to accommodate a stunt. Lighting, camera angles, we don't worry about any of this until Post-Production. This lets us focus on getting that "perfect master take" with the Actors, **encouraging the spontaneity and improvisation** that brings life and genuine emotion to the scenes.

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MOTION CAPTURE



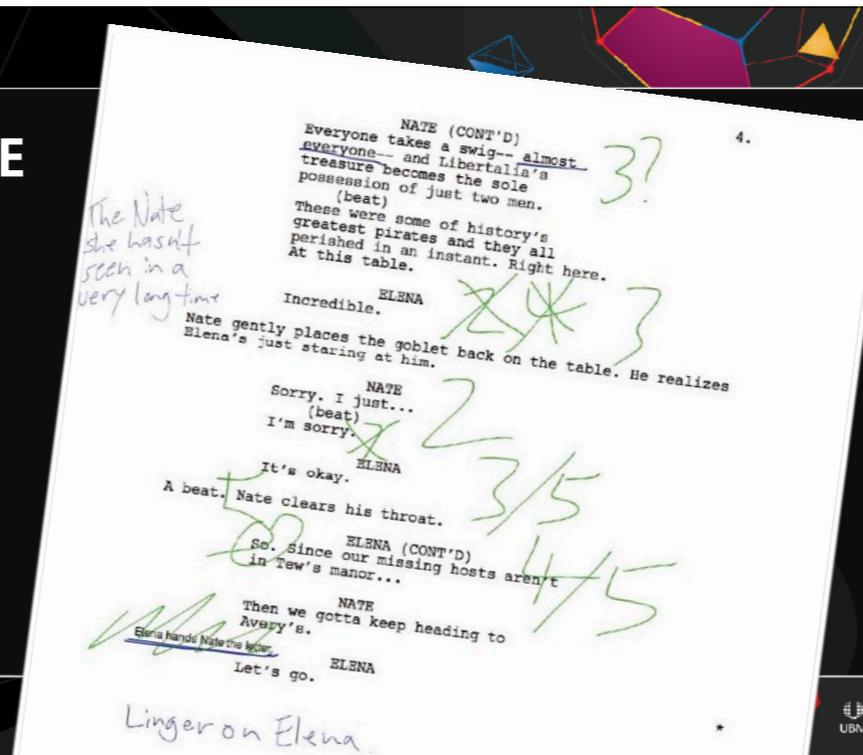
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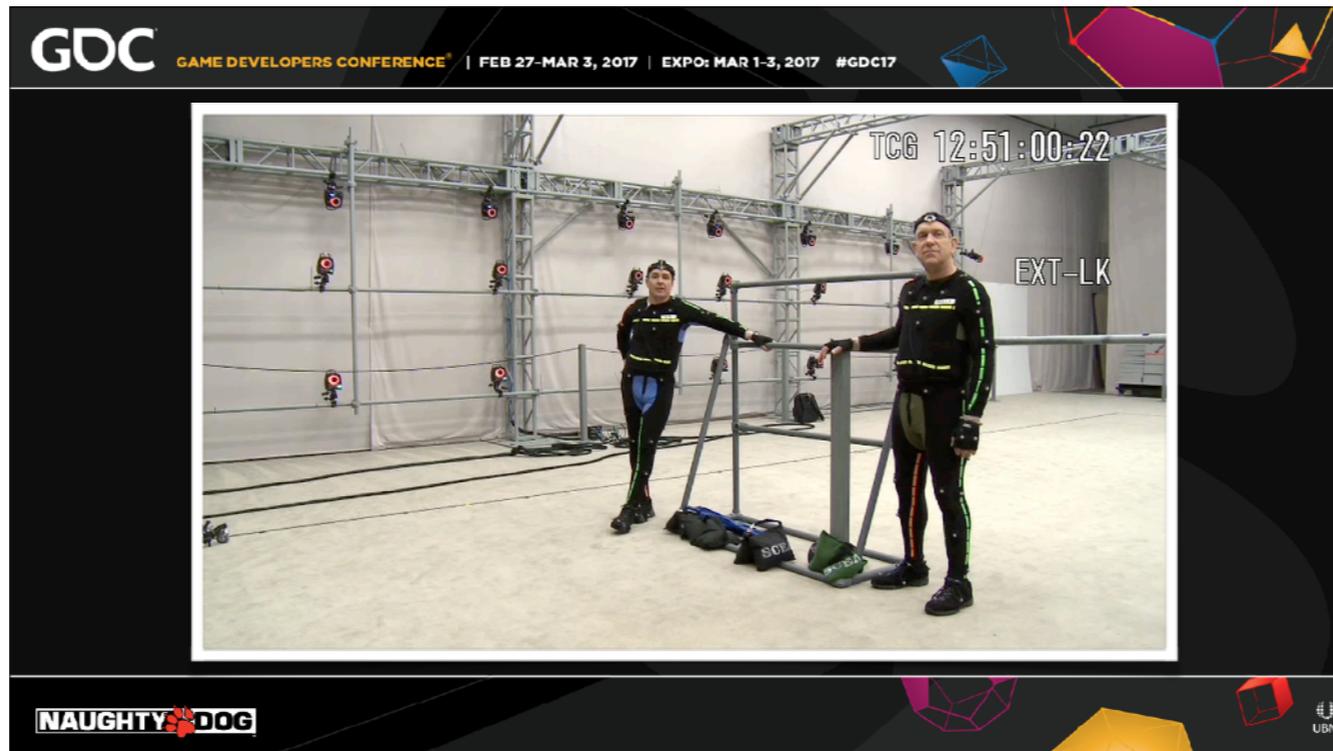
During the shoots, the Creative Director acts as the Director on set, partially because that's who's worked most closely with Design throughout the Production process, and therefore who can give the most context to the Actors.

Meanwhile, the Editor's job at a shoot is twofold. First, **staying aware of the Director's notes**, since then later they can be more helpful at personally executing—or communicating—the Directors' intention behind each moment.

MOTION CAPTURE



And secondly, the Editor ensures we have the material we need to craft the dialogue performances later. This includes noting which takes were the best performances of a particular line...



...as well as **asking for a Wild Take to get a clean read of a line when the performance is still fresh**, rather than trying to recreate it months later in ADR. This is especially useful for **Efforts**—those "grunts" you hear when characters exert themselves—which often get spoiled by set, prop, or suit noise while the Actors are moving around.

{PLAY}

<https://youtu.be/ulbSVcgeXU0>

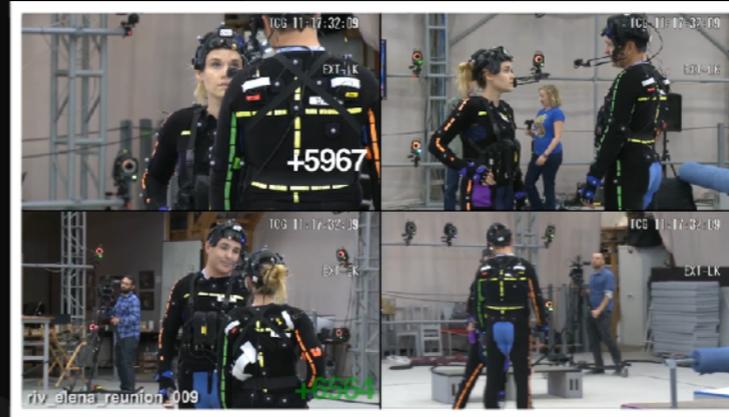


Once the footage of our Actors is "in the can," the real work begins: breaking it into pieces for the Design, Animation and Audio teams. Back at the office, the Editor, Lead Animator and Creative Director start editing as soon as possible.

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CUTSCENE EDITORIAL

“4-Ups”



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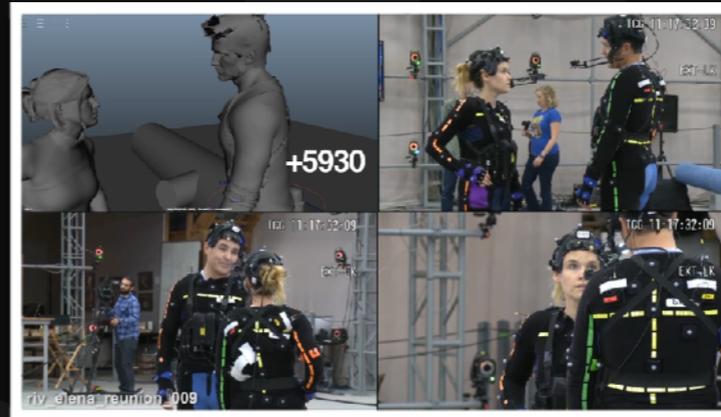
We've found that cutting together reference videos is the **fastest and most efficient way to communicate the eventual shape of a performance.**

After choosing which takes of mocap we want to use, we create 4-paneled videos called "4ups" that show reference footage of the Actors alongside the intended camera angles.

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CUTSCENE EDITORIAL

Cameras



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As we experiment with cameras (and massaging the blocking for the best composition), you end up having to **watch them with a split focus**, looking at face here, body and camera there, and sometimes even listening to audio that doesn't match the Actor's lips.

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CUTSCENE EDITORIAL

Facial



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This is because **we can take advantage of the fact that this isn't live action**. We can swap in different audio takes if we need to fix something—or use those Wild Takes to cover spoiled dialogue. The facial motion capture is even ordered separately after the edit is locked, and conformed to match. **So we truly have the freedom to change anything.**

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CUTSCENE EDITORIAL



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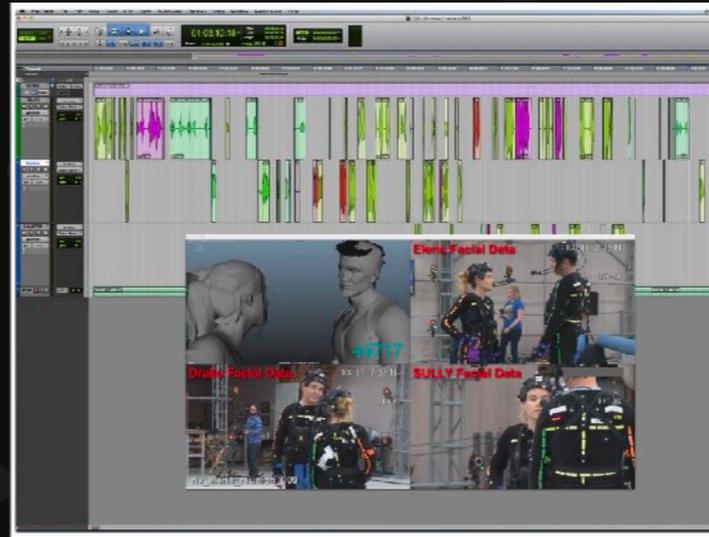
UBM

{SILENT} <https://youtu.be/OOzGVQcjDPI>

- Like swapping only one actor's mocap for an alternate take to get a cool gesture they did in there.
- Or cutting between two different performances in the middle of a shot. Normally we hide these edits on a camera cut just like live action—but if we don't, our Animators then have to clean up the resulting "pop" in the mocap.
- Or, at the most extreme, grabbing the face, audio and body all from different sources to cobble together a moment we don't have. Usually that's because we discover a way something could play better in the edit—and since we didn't get it originally we've got to fake it.

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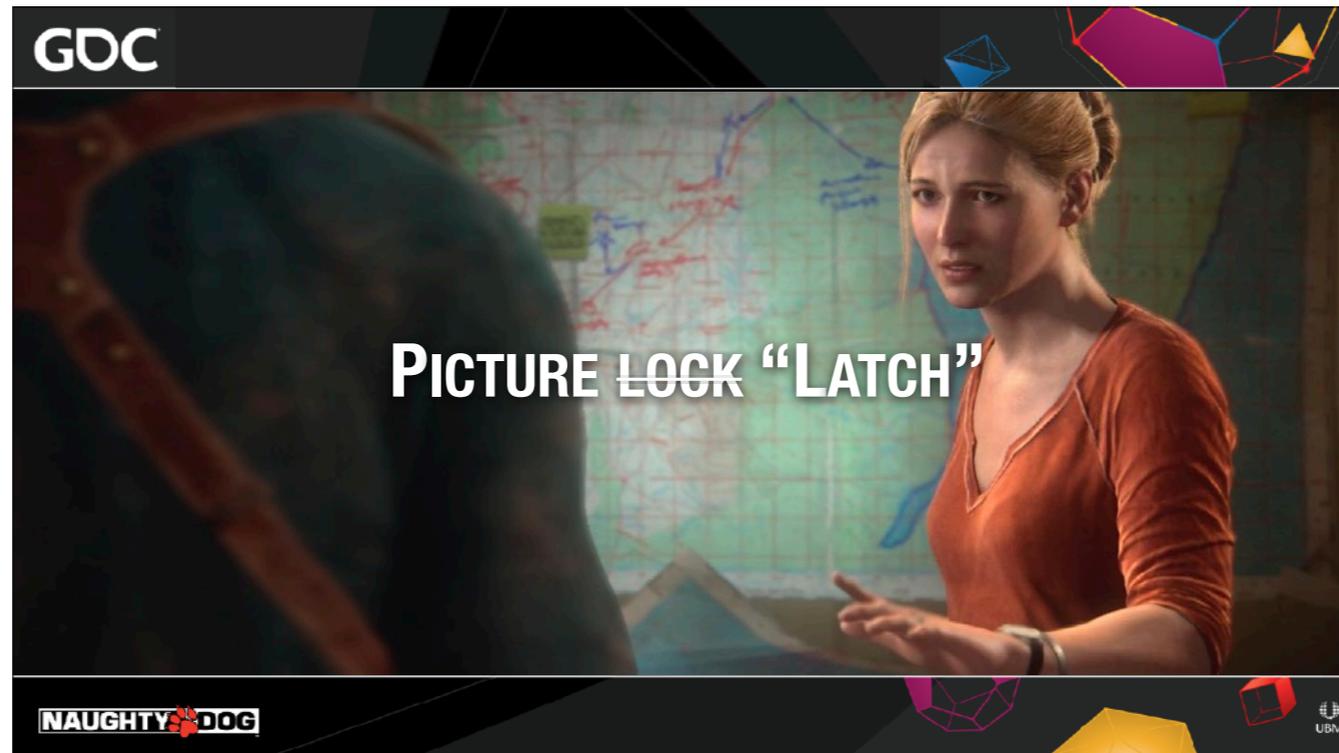
CUTSCENE EDITORIAL



NAUGHTY DOG

UBM

But usually the most we do is swap reads of some lines to increase clarity or subtlety. There's definitely magic in a performance that can easily be shattered if you stray too far from the source.



Once a scene's edit is approved, that 4up reference video is funneled to every department that will be involved in the further translation of these performances. This includes Animation, Props, Environment, Lighting, Sound, and Design.

But they all know the scene isn't "picture locked"—more like "**picture latched**"...because, as I warned, **these edits may very well have to change.**

PICTURE “LATCH”

•Timing



{SILENT} <https://youtu.be/bQ6f18Ov9PE>

- Sometimes, a change is required because of a mistake in the edit. Nailing the timing of a moment can sometimes be difficult, since you're essentially looking at mannequins in one pane, and trying to sell an emotional transition from the Actor in another. When the facial animation is applied and we look at the scene full-frame, things might move just a little too quickly, so we have to adjust—and then communicate those timing changes to all the affected departments.

PICTURE “LATCH”

- Timing
- Set change



{SILENT} <https://youtu.be/363iQ2xUnFc>

- Another change that comes up is that **sets are often altered to accommodate gameplay revisions**. The entrance or exit to a space had to move. There's a wall in front of that camera, or a cover object sitting right in the middle of a Character. Usually, these require minor Animation fixes, like moving characters or cameras. At worst, the environment might need to be reverted by Art and Design.

PICTURE “LATCH”

- Timing
- Set change
- Continuity



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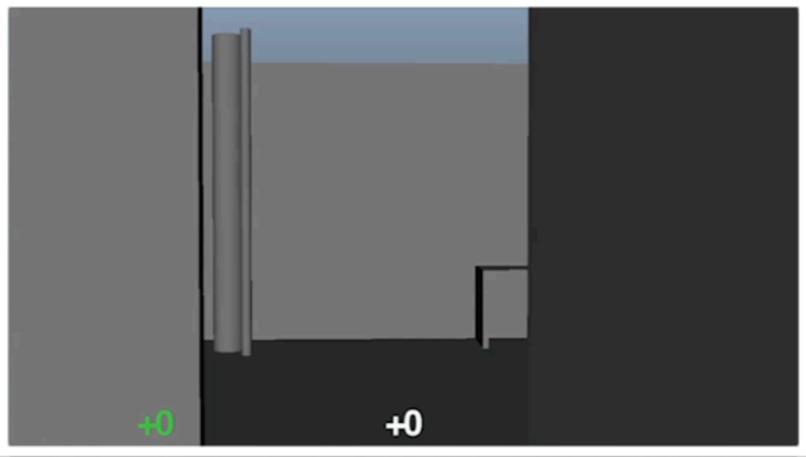
- The biggest changes come in maintaining continuity with gameplay. Since the transition of characters entering or leaving a scene needs to feel “seamless,” their animations have to match what’s happening in gameplay.

Design helps ensure this by creating "pinch points" that force a certain action from the Player—like opening a door or vaulting over something—that will blend into the start of a scene. And when it’s over, we often **blend characters’ movements into regular gameplay animations** to match on the way out.

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PICTURE “LATCH”

- Timing
- Set change
- Continuity



NAUGHTY DOG

UBM

But, when gameplay changes, so do these entrances and exits. Often this means re-capturing or at least re-animating that portion of the material.

{SILENT} <https://youtu.be/Kbpulp7ZiLs>

- Like this scene in *The Last of Us*, which first had to have the camera corrected to not be behind the Player—that would be too similar to gameplay. Then the level changed so that Joel would be in the lead rather than Ellie, so we needed to pickup a new opening where Joel went in first.

PICTURE "LATCH"

Lingering
Cutscenes...

Scene	Status	Priority	Dependencies	Start Date	End Date	Owner	Notes
000001	Completed	High		2010-01-01	2010-01-01	John	Intro cutscene
000002	In Progress	Medium	000001	2010-01-02	2010-01-05	Jane	Character introduction
000003	On Hold	Low	000002	2010-01-06	2010-01-10	John	Environmental cutscene
000004	Completed	High		2010-01-11	2010-01-11	Jane	Dialogue cutscene
000005	In Progress	Medium	000004	2010-01-12	2010-01-15	John	Action cutscene
000006	On Hold	Low	000005	2010-01-16	2010-01-20	Jane	Character interaction
000007	Completed	High		2010-01-21	2010-01-21	John	Final cutscene
000008	In Progress	Medium	000007	2010-01-22	2010-01-25	Jane	Ending cutscene
000009	On Hold	Low	000008	2010-01-26	2010-01-30	John	Post-credits cutscene
000010	Completed	High		2010-01-31	2010-01-31	Jane	Game over cutscene

As these scenes change, we have to keep careful watch so nothing slips through the cracks. Sometimes **certain scenes linger in a "partially" done state for a long time**, waiting on a character model or a set that didn't exist when it was shot.



However, Cutscenes are just the tip of the iceberg. Since we like to keep the Player in control as often as possible, we've **increasingly relied upon methods other than Cutscenes** for implementing story beats. One major way is through animations we call **IGCs**.

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IGCs

vs Cutscenes



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“IGC” stands for “In-Game Cinematic” because—until Uncharted 4—all our Cutscenes were pre-rendered movies, so **IGCs define the distinction between animations that happen live in game**, versus more traditional non-interactive narrative moments like Cutscenes.

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IGCs

vs Cutscenes



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UBM

Now that everything plays back in real-time, the biggest distinction is that **some aspect of the animation is usually interactive**. In the very least, the Player might have camera control—but that all depends on the particular IGC.

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IGCs



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Some are as insignificant as opening a door, or walking into frame at the start of a level.

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IGCs



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Others are full-blown mini-Cutscenes, sandwiched between gameplay moments with no camera cuts, like during this puzzle in Uncharted 4.

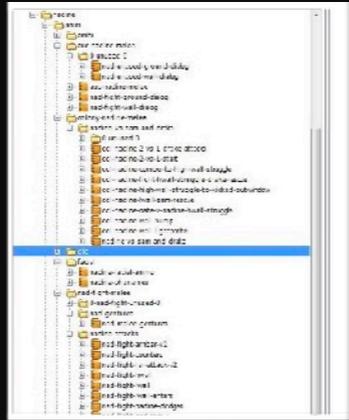


{SILENT} <https://youtu.be/kRePtBAAZhE>

IGCs are also a clever method we use nowadays to **blend into and out of our Cutscenes**. The first or last shot of some Cutscenes on Uncharted 4 were IGCs, so the camera could blend smoothly, transitioning on a camera cut to the rest of the non-interactive Cutscene.

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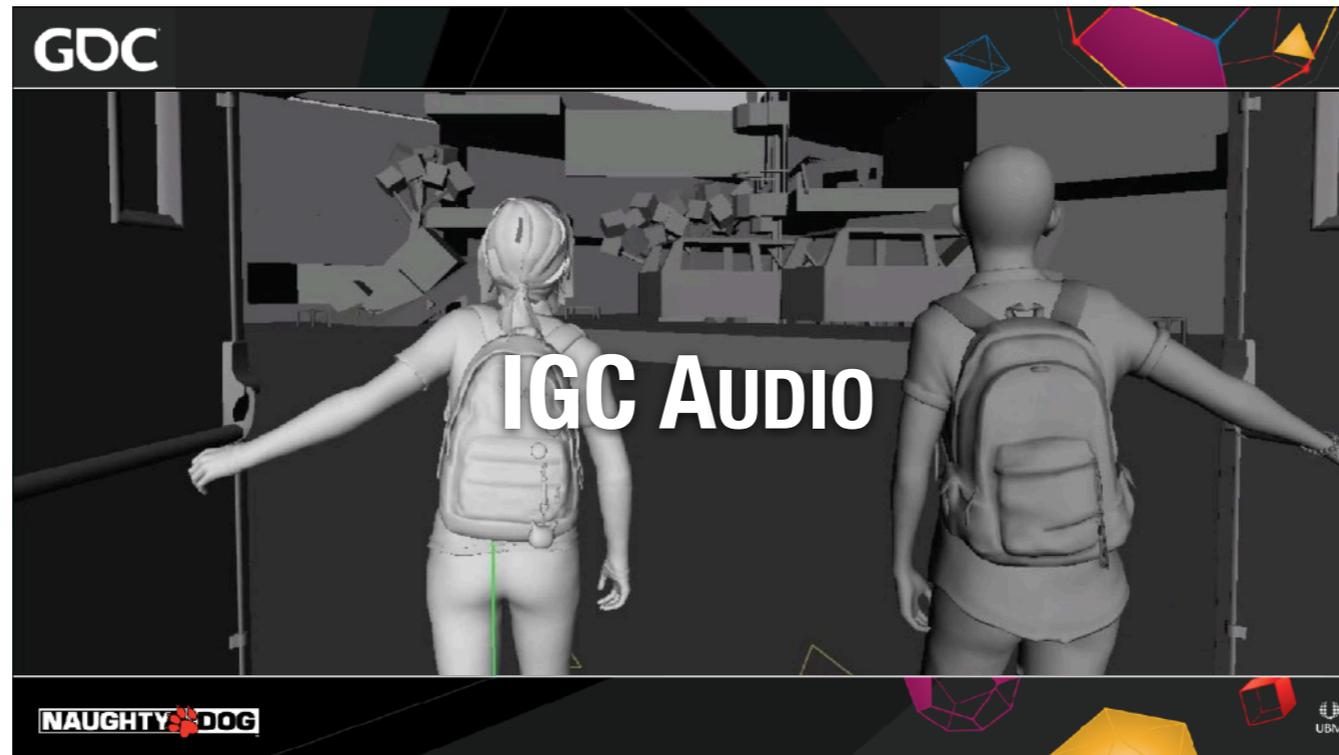
IGCs



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UDM

There are hundreds of these littered all throughout the game, and **they often will change multiple times**, being shortened, lengthened, or recaptured, until Design thinks they “feel” right, within the pace of the gameplay around them.

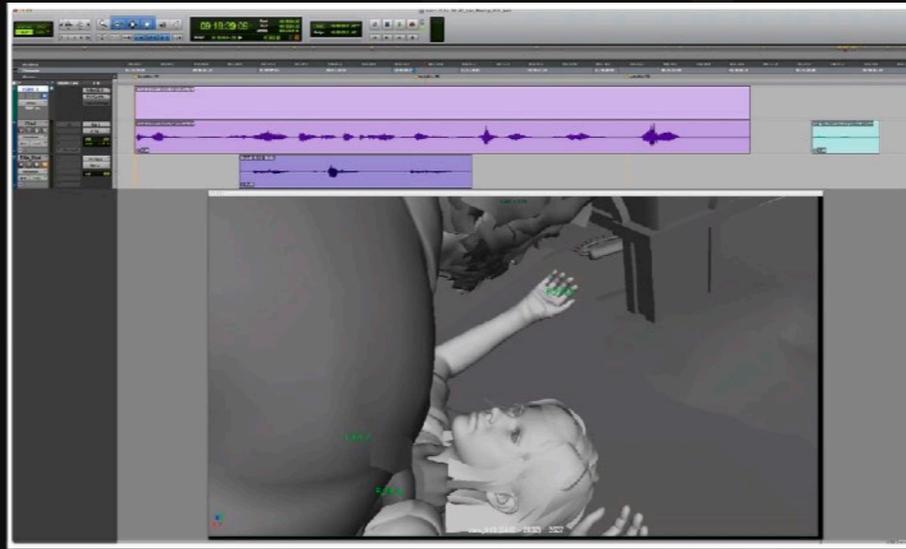


Editorial, like with Cutscenes, needs to keep up with any timing adjustments, moving parts of the audio around to match the animation as it changes.

But even though the interactivity of an IGC offers great advantages for gameplay, **the way their audio works sometimes offers additional challenges.**

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IGC AUDIO



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UDM

IGC dialogue is similar to a Cutscene **in that it plays from the first frame of the animation until the end**, usually containing several lines of dialogue and/or efforts precisely timed to the animation.



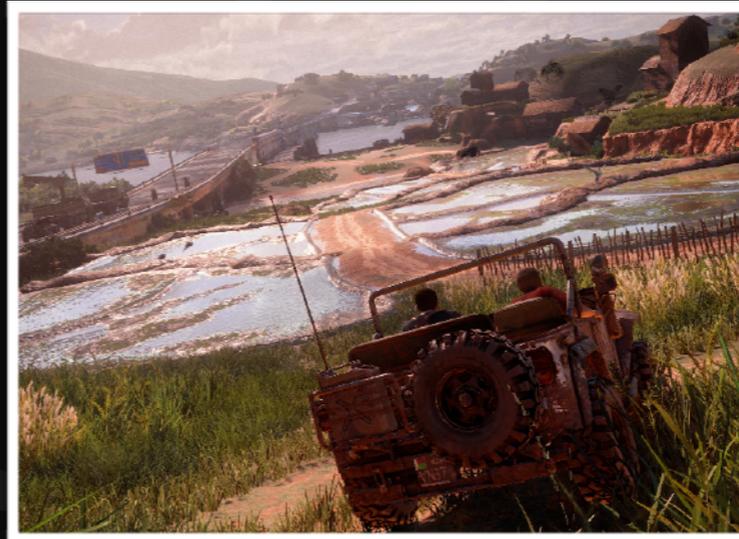
However, that's where the similarities end. Unlike Cutscenes—which play back like a movie, **where every volume level or perspective shift is crafted and controlled**—IGCs often have to account for a real-time, interactive camera.

So, IGC dialogue plays directly from the "voice box" of each character in 3D space. This creates different mix issues, because...

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IGC AUDIO

Camera = “Listener”



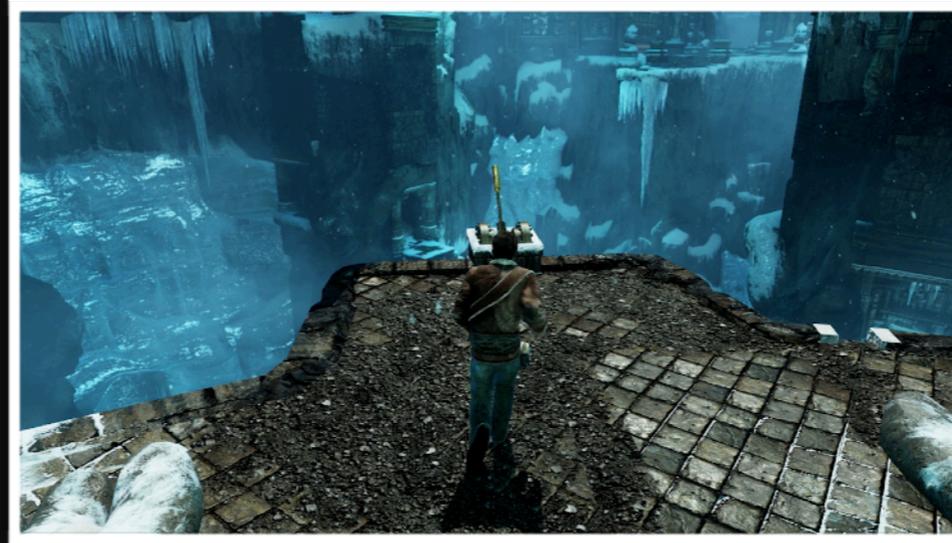
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UBM

...our Camera is the **Listener** (i.e. microphone) by default. The benefit is that the **position of the character's voice automatically matches what you're seeing on screen** without any post-production work—*Instant Realism!*

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IGCs



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But the downside is that **if the camera is really far away** and we want you to hear the speaker clearly, we have to cheat how the line plays. Or **if the camera cuts while someone's speaking**, suddenly the person you hear in your left ear is now talking on your right mid-word, which can be distracting.

- *In this moment from Uncharted 2, we dealt with both problems. It took a lot of trickery to make Nate's voice audible from across the Ice Cave. But when the camera cuts across the space, you'll notice we couldn't quite fix the "pop" in Nate's voice as the camera cuts.*

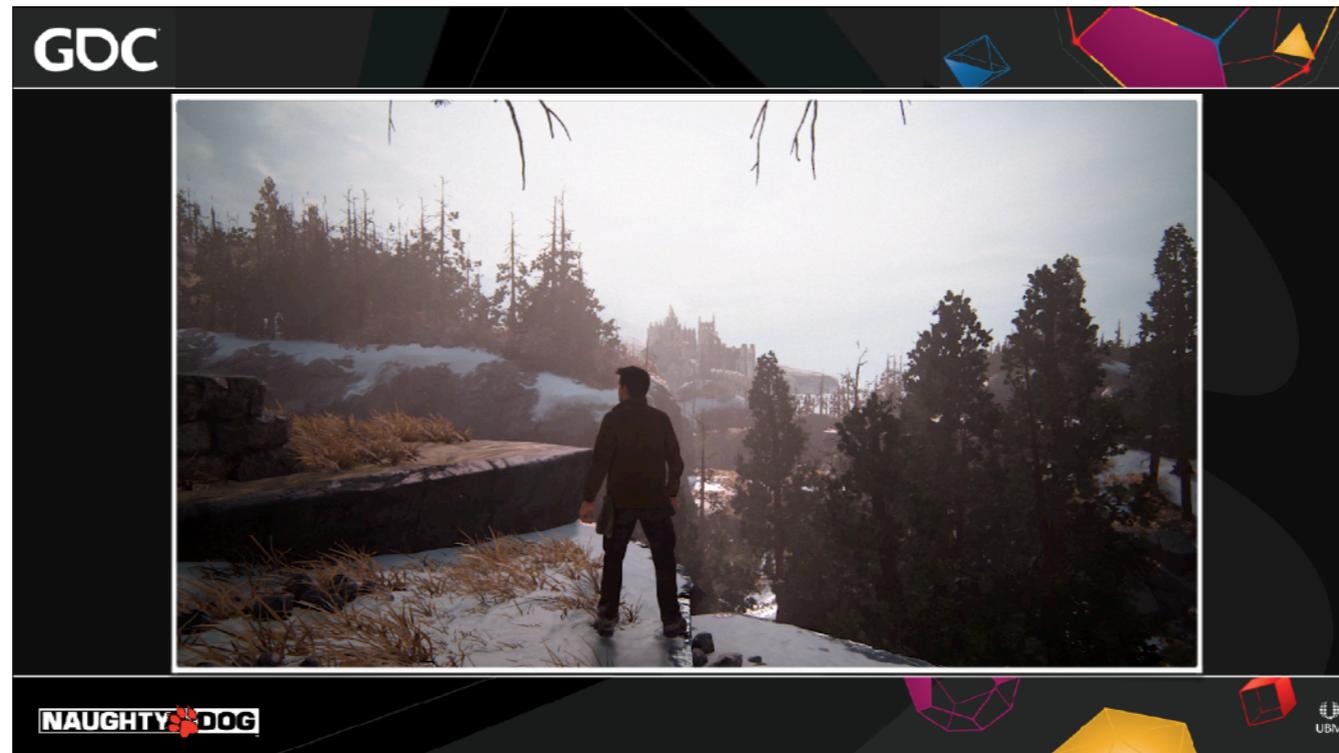
{PLAY} https://youtu.be/TTX47865_OQ



But wait, there's more!

Cutscenes and IGCs are only half the battle. Our performances would not feel seamless without **a lot of other systems** that play in between them.

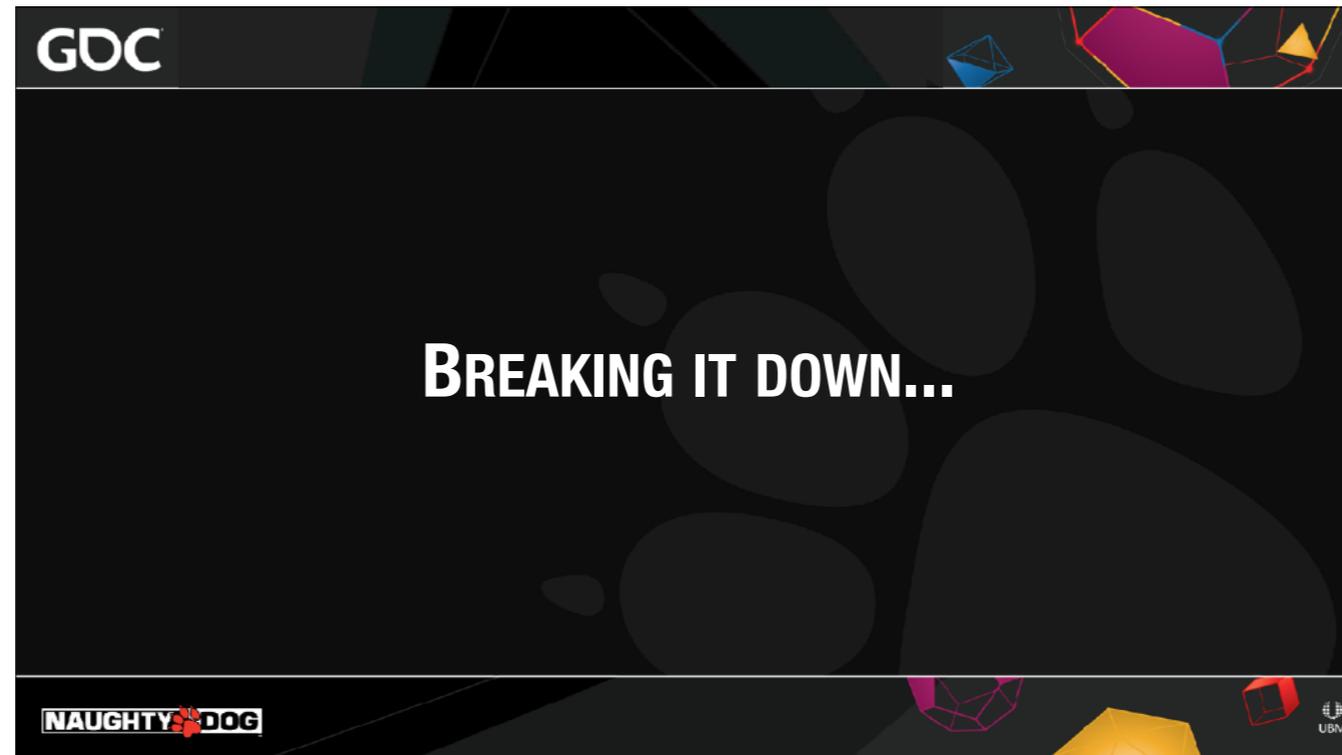
Before I break those down further, I'd like to look at an example clip of what it all looks like when everything comes together.



During this beat of Uncharted 4, Nate and Sam are just starting the next leg of their journey—exploring the ruins of a Scottish monastery that their rival, Rafe, and the team of Mercenaries he's employed are trying to excavate with dynamite.

The Drake brothers meet the Shoreline mercs for the first time, learn the new dynamite gameplay mechanic, and solve the first puzzle of the level: finding a crate to climb past a section of ruins. That is, until another team of mercenaries arrive...

{PLAY} https://youtu.be/DgM8vrAtz_Q



There's a lot going here, with **every element helping convey our story beats.**

At a glance, these elements include:

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BREAKING IT DOWN...

In-Game Cinematics



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* IGCs when Nate uses his rope, and later when he picks up the dynamite.

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BREAKING IT DOWN...

Layered
Gestures



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* **ANIMATED GESTURE LAYERS** on Nate and Sam as they explore and converse.

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BREAKING IT DOWN...

Cutscene



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* a brief **CUTSCENE** of Nate & Sam finding the Shoreline equipment before they're ambushed.

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BREAKING IT DOWN...

Enemy
Dialogue



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* **SYSTEMIC ENEMY DIALOGUE** from our Shoreline Mercenaries as they attack the Player.

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BREAKING IT DOWN...

“Buddy”
Dialogue



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UBM

* **SYSTEMIC BUDDY DIALOGUE** from Sam when the Player successfully stays in cover.

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BREAKING IT DOWN...

Efforts!



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UBM

* **EFFORTS** as Nate knocks out the last Merc, and then lands from a long drop near the ruins.

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BREAKING IT DOWN...

Story
Dialogue



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UBM

* And, of course, before and after all of this there's also crap-tons of **STORY DIALOGUE** playing.



So, about that STORY DIALOGUE...

Most of the dialogue you hear in our games are **individual lines scripted by hand, with specific timing**. We even have a Designer and a Scripter 100% dedicated to creating systems for hooking it up. They can't complete a game entirely on their own, since by the time the game is finished, there's too much material for them cover alone. But they are *usually* the ones **triggering lines to play based on numerous conditions**—some as simple as when a Player walks through a defined region, others much more complex.

Rather than play with rigid timing like Cutscenes and IGCs, **we cut our dialogue into pieces that can flexibly respond to the Player's actions**. This also means we can adjust the execution more easily as things change during development.

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IN-GAME DIALOGUE

- Keeps Characters Alive
- Grounds Gameplay goals
- Informs Player of State Changes
- Sells Realism of the Environment

NAUGHTY DOG UDM

These in-game dialogue moments actually make up a larger percentage of narrative beats than our Cutscenes. We feel this type of material is crucial because:

- It **carries the story forward** by keeping the characters alive between Cutscenes.
- It can **justify practical, gameplay-driven goals** within the context of the narrative.
- Likewise, it **informs the Player** of any changes in tension (like exploration or combat states).
- It's also a vital tool for **selling the realism of the environment** in the Player's mind when the characters respond contextually to it.

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ADR



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UBM

Unlike the cutscenes and many of the IGCs, **most of this dialogue doesn't come from the mocap stage.** That's because it primarily requires the characters speaking while in the Player's in full control.



So, we record the lion's share of this content at an ADR studio. The Actors are usually paired up so we profit from their chemistry, just like at mocap. Also, they wear the same type of microphones so the audio quality matches that of the stage.

ADR

Character	Dialogue	Description	Take	Notes
Sam	(Whistles) Long drop.	***Save Back to Day*** "Should be one down at the junction" "The hell did you get up there?" "It's pretty jarring on the legs" "I'm not sure if that's a good thing"	Take	
Drake	Yeah. Need to find another way down.		Still	
Drake	This should hold.	Not final for now	Hold	
Sam	Oh. Good call.		Still	
Sam	Notion. Over here. We can attach the rope to that thing.	Notion for now	Swap	
Sam	Okay. We're good.	Notion for now	Still	
Drake	Nice to meet you too, Shoreline. Seems like they were expecting us.		Still	
Sam	And like they're searching away from the cathedral.		Still	
Drake	Which means we should get to the graveyard, pronto.		Still	

The scripts for ADR sessions come online rather late—as the levels they reflect often are still being locked down by Design.

This means that most of the time, the Actors are reading their lines without any time to prepare. **So we bring a video capture of the level—in its most current state—to give them context.**



And any time there's a Cutscene that we've already shot and implemented, we watch those down with the Actors to remind them of the character's emotional state that they need to match to keep the tone consistent.

GDC

ADR

- Essential Material



NAUGHTY DOG

UBM

Because the game is still in flux, we record a variety of material in anticipation of ways in which the game might change.

- **Gameplay Conversations** make up the bulk of our recording. These aren't always straightforward, because **sometimes parts of them are optional**. The Actors will perform one version of the conversation all the way through, then pick up the other versions right away to keep the energy consistent.

GDC

ADR

- Essential Material



NAUGHTY DOG

UBM

••• Such as: in that Scotland clip, different lines would play out depending on when the Player interacted with that yellow crate.

{PLAY} <https://youtu.be/x3XKtjW5kbc>

ADR

- Essential Material
- “ALTs”

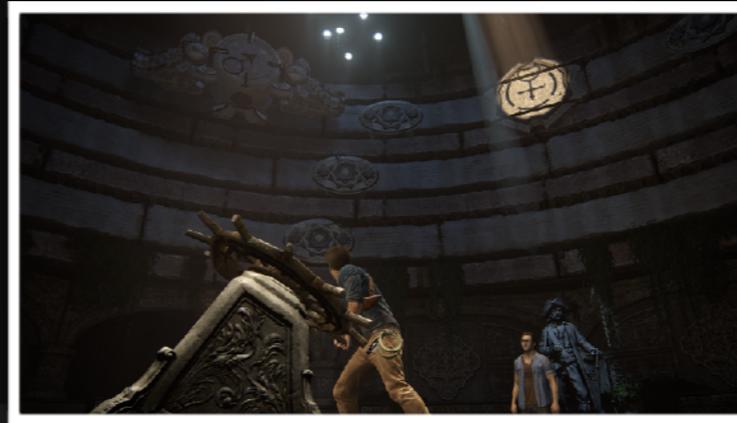
ADR ID	Category	Date	Status	Notes
Island Arrival				
VO Dialogue Pickups - CLAYD ARRIVAL	dialog, cheer, cry, life	10/14/2015	Arch	Included
Island	dialog	10/15/2015	Tim	Included
Island	dialog	10/15/2015	Tim	Included
Island	dialog	10/14/2015	Tim	Included
Island	dialog	10/14/2015	Tim	Included
Island	dialog	10/14/2015	Tim	Included
Island	dialog	10/14/2015	Tim	Included
Island	dialog	10/14/2015	Tim	Included
Malacca				
VO Dialogue Pickups - MANAGER	secondary characters	11/11/2015	Arch	Recorded
man-act1		11/11/2015	Arch	Included
man-act2		11/11/2015	Tim	Included
man-act3		11/11/2015	Arch	Included
Island				
VO Dialogue Pickups - DIALOGUE	action, sound, emotion, state, plans...	11/12/2015	Arch	Included
col-act1		11/12/2015	Arch	Included
col-act2		11/12/2015	Tim	Included
col-act3		11/12/2015	Tim	Included
col-act4		11/12/2015	Arch	Included
col-act5		11/12/2015	Arch	Edited
col-act6		12/5/2015	Tim	Recorded
col-act7		11/12/2015	Arch	Recorded
Suntem Ruins				
sun-upon-entrance	dialog, event	11/14/2015	Tim	Recorded
sun-upon-entrance	dialog, event	11/14/2015	Tim	Picked
VO Dialogue Pickups - SUNTEM RUINS	dialog, event	11/14/2015	Arch	Picked
sun-entr-act1		11/14/2015	Tim	Picked
sun-entr-act2		11/14/2015	Tim	Picked
sun-entr-act3		11/14/2015	Tim	Picked
sun-entr-act4		11/14/2015	Tim	Picked
sun-entr-act5		11/14/2015	Tim	Picked
sun-entr-act6		11/14/2015	Tim	Picked
sun-entr-act7		11/14/2015	Tim	Picked

* Sometimes we also pick up **alternate versions of lines**—“ALTs” for short—especially when the level is in a rougher state and we need to have multiple options as Design locks things down later. This frequently happens for puzzle spaces, among others—since they require tons of specific VO and animations to cover what the Player does (and in what order).

*** On *Uncharted 4*, we even kept a “wish list” of ALT lines that Design thought they might need, and tried to cover them all as pickups near the end of recording. This resulted in much better coverage for the final game than we’ve ever had before.

ADR

- Essential Material
- “ALTs”
- “CYA” Lines



* We also have a whole category we call "**CYA Lines**" (as in "cover your ass"), which are generic phrases like "Hey, look at this" and "Come on, this way"—which we record in multiple emotional states and contexts **Just In Case** we need them at a later date—either to help with gameplay changes or maybe sell a character beat. We record these with our heroes and all their Buddy allies.

ADR

- Essential Material
- “ALTs”
- “CYA” Lines
- Improvisation



*Just like at mocap, **our Actors are encouraged to improvise during ADR**. Sometimes this will inspire us to rewrite—and re-record—a new version of a conversations on the spot.

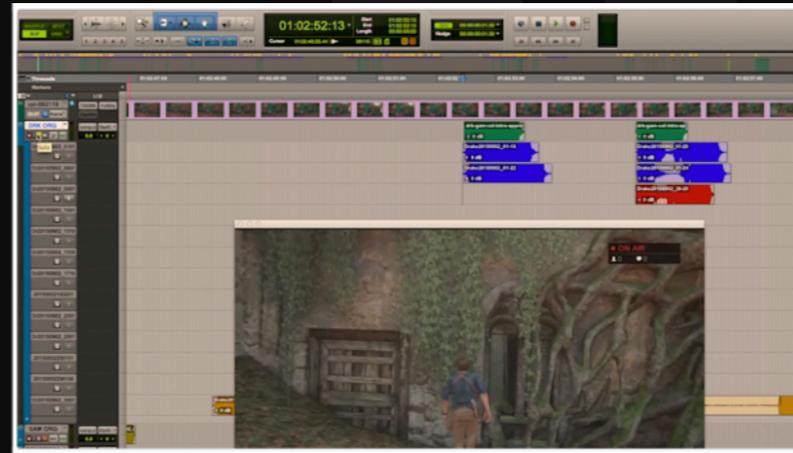
* And at the end of most sessions, **we also record "Wild" passes of our levels**, where the Actors watch the playthrough video again and are encouraged to riff on top of it. Though our Writers try to cover everything we need in a given section of the game, this often provides alternate versions of lines—or completely new conversations—that add enormous amounts of spark and character. We extract these "gems" and use them whenever possible.

****For instance, Sam's "location, location, location" line in that Scotland clip was an improv that Troy Baker threw in and we kept.*

GDC

DIALOGUE EDITORIAL

“Stacking”



NAUGHTY DOG

UBM

All our recorded dialogue is then brought back to the office and "stacked" in time to the video. This means each take of a line is edited in a ProTools playlist and arranged in columns, so we can quickly listen down to all the takes of a line when making our selects.

{PLAY} https://youtu.be/_2KO3EQZLFE

DIALOGUE EDITORIAL

Import into
Database

hillside-valley			
Sam	sm-gem-va-hillside-valley-001	Okay. We're good.	Immediately after combat ends.
Drake	dk-gem-va-hillside-valley-001	Nice to meet you too, Shoreline. Seems like they were expecting us.	
Sam	sm-gem-va-hillside-valley-002	And like they're searching away from the cathedral.	
Drake	dk-gem-va-hillside-valley-002	Which means we should get to the graveyard, pronto.	
Sam	sm-gem-va-hillside-valley-003	Exactly.	
hillside-ruins			
Sam	sm-gem-va-hillside-ruins-001	What's this place?	Note: sm and Sam drop into the first ruins section.
Drake	dk-gem-va-hillside-ruins-001	The monks had several living quarters... the main one being by the graveyard of course.	
Sam	sm-gem-va-hillside-ruins-002	Location, location, location.	
Sam	sm-gem-va-hillside-ruins-003	More Shoreline equipment.	Sam sees scaffolding or other Shoreline stuff.
Drake	dk-gem-va-hillside-ruins-003	At least no Shoreliners .	
Drake	dk-gem-va-hillside-ruins-003	Maybe we'll get lucky and they'll blow themselves up.	BOOM. Another distant explosion.
Sam	sm-gem-va-hillside-ruins-004	It's open.	
Drake	dk-gem-va-hillside-ruins-004	Now what do you bet...?	Note: finds the box of dynamite.
Drake	dk-gem-va-hillside-ruins-005	{beat} Yup . Dynamite.	

These picked lines are then edited into individual files with unique names, and uploaded to our dialogue database tool. **Editors also distribute scripts from the database to our Designers**, so they have a list of what content they need to implement.

GDC

DIALOGUE EDITORIAL

Reference
Video



NAUGHTY DOG

UBM

Along with the scripts, we also supply another form of **reference movie**. Unlike our Cutscene 4ups, which are tied to motion capture data, these are instead exports of the very movies the Actors ADRed to, with dialogue placed to match the **timing** of the Actors' original deliveries.

{PLAY} <https://youtu.be/PfwFQPIpJB8>

These ref vids help show **where and when the individual lines of dialogue should to be scripted play**, so that it “feels”—and sounds—like a realistic performance. Designers use it as a guideline as they **translate all this cinematic pacing and subtlety into scripted math**.

GDC

```
)  
(wait 1.0)  
(wait-say 'samuel 'vox-igc-sam-gam-sco-hillside-ruins-003)  
;More Shoreline equipment.  
(wait-say 'player 'vox-igc-drk-gam-sco-hillside-ruins-002)  
;At least no Shoreliners.  
(set-boolean 'shoreline-vox-done #t 'ss-sco-hillside-valley-sam-controller-1)  
(wait (random-float-min-max 3.0 6.0))  
(send-event 'dynamite 'ss-sco-hillside-cathedral-dynamite-fx-1)  
(wait 1.25)  
(wait-say 'player 'vox-igc-drk-gam-sco-hillside-ruins-003)  
;Maybe we'll get lucky and they'll blow themselves up.  
(wait 0.75)  
(wait-say 'samuel 'vox-igc-sam-gam-sco-hillside-climb-006)  
;Ha  
(set-boolean 'ruins-vox-done #t 'ss-sco-hillside-valley-sam-controller-1)  
(send-event 'vox-done 'ss-sco-hillside-cathedral-dynamite-fx-1)  
(go 'hillside-ruins-convo)
```

IMPLEMENTATION

NAUGHTY DOG

UDM

The goal is to **include proper beats for a breath or natural pause between lines**—either for the speaker to have a new thought, or for the companion character to listen before responding. **When we don't hit this, the moment can feel rushed, disjointed, or flat-out confusing.**

IMPLEMENTATION

Timing in
Script

```
(state ('job-conversation)
  (on (start)
    (suspend-idle-gestures 'elena)
    (set-boolean 'conversation-active? #t)
    (set-boolean 'disallow-vox? #t 'ss-vox-sun-averys-house-1)
    (npc-stop-script 'elena)
    (npc-request-follow 'elena)
    (wait-say 'player 'vox-igc-drk-gam-sun-averys-house-entrance-010)
    : "Your producer on your TV show?"
    (wait-say 'elena 'vox-igc-eln-gam-sun-averys-house-entrance-009)
    : "No. My manager from Macho Nacho."
    (wait-say 'player 'vox-igc-drk-gam-sun-averys-house-entrance-011)
    : "You worked at Macho Nacho?"
    (wait-say 'elena 'vox-igc-eln-gam-sun-averys-house-entrance-010)
    : "It was a high school job."
    (wait-say 'player 'vox-igc-drk-gam-sun-averys-house-entrance-012)
    : "[beat] Did you wear one of those hats?"
    (wait 0.5)
    (wait-say 'elena 'vox-igc-eln-gam-sun-averys-house-entrance-011)
    : "[beat] Point is... my boss was a paranoid psychopath."
    (wait-say 'player 'vox-igc-drk-gam-sun-averys-house-entrance-014)
    : "He was the manager at a Macho Nacho."
    (wait 0.5)
    (wait-say 'elena 'vox-igc-eln-gam-sun-averys-house-entrance-012)
    : "Watch it."
```

It sometimes takes several passes to get timing right in-game. **The Designers can only use these movies as a guideline**, because often the video's timing was too fast or slow, and **not representative of how everyone might play the game**. They use their best judgment, trying to keep **3 different potential play styles** in mind:

GDC

IMPLEMENTATION

Different Play Styles



NAUGHTY DOG

UBM

* Some Players like to **Explore**, taking their time, stopping to hear every lovingly crafted line so they don't miss a thing.

* But if we were to time out everything to that play style, it would ruin the experience of more **Average** Players, who like to enjoy the story but keep things moving.

*** Where we can, the simplest solution is to just have certain lines **not play** if the Player is going to fast. Like in the Scotland ruins, the line specifically pointing out that a ledge is "too high for a boost" doesn't play if the Player rushes out of there before the previous conversation is finished.

{PLAY} <https://youtu.be/EF4diXE1TUk>

* And then there's the **Speedy** Players, who dash through the puzzles to get to the next combat setup. We do our best to get our conversations playing naturally—but quickly—so they don't get lost, but sometimes it can't be helped.

IMPLEMENTATION

Timing is
Key



*** Once in awhile, we have an area too small for the amount of VO that has to play, and end up shipping with moments that can feel like a string of lines back-to-back, depending on how quickly the Player is going. Like this moment in Uncharted 3 that just ended up a little too tight, compared to the pacing of the cutscene that preceded it.

{PLAY} <https://youtu.be/0wkLdee5cMY>

GDC

IMPLEMENTATION

“The Sweet Spot”



NAUGHTY DOG

UBM

If we get the timing right, it can convey subtlety without needing a specific body gesture or facial performance to sell a moment.

**** Like in this bit from The Last of Us, the pause before Ellie's "oh" line conveys a turn: her realization about Joel's darker past. Her follow-up question then gives Joel an awkward pause of his own. All of this emotional content manages to fit in one small stairwell, even if the Player never stops.*

{PLAY} <https://youtu.be/xG2aLMeW-cw>



That moment worked on dialogue Timing alone. But when we need more, we can dynamically **add extra body motions** to our Story dialogue to increase physical—and emotional—realism.

**** In that Scotland clip, when you saw Nate waving his arm and actually looking at Sam while talking to him, that was an example of our **Gesture System**.*

GESTURES



In previous games, we've had all sorts of **Contextual Move-sets & Animation** that helped sell the reality of the Hero's world by having him/her react to their environment. Whether it be recoiling from fire, stumbling while exhausted, bracing themselves against walls, etc.

GDC

GESTURES



NAUGHTY DOG

UBM

Our designers are also able to play **additional unique animations** on our AI characters to bring them to life contextually. That's what allows Sam to look around and dynamically check out the world around him.



{SILENT} https://youtu.be/tOEE_Qft0vg

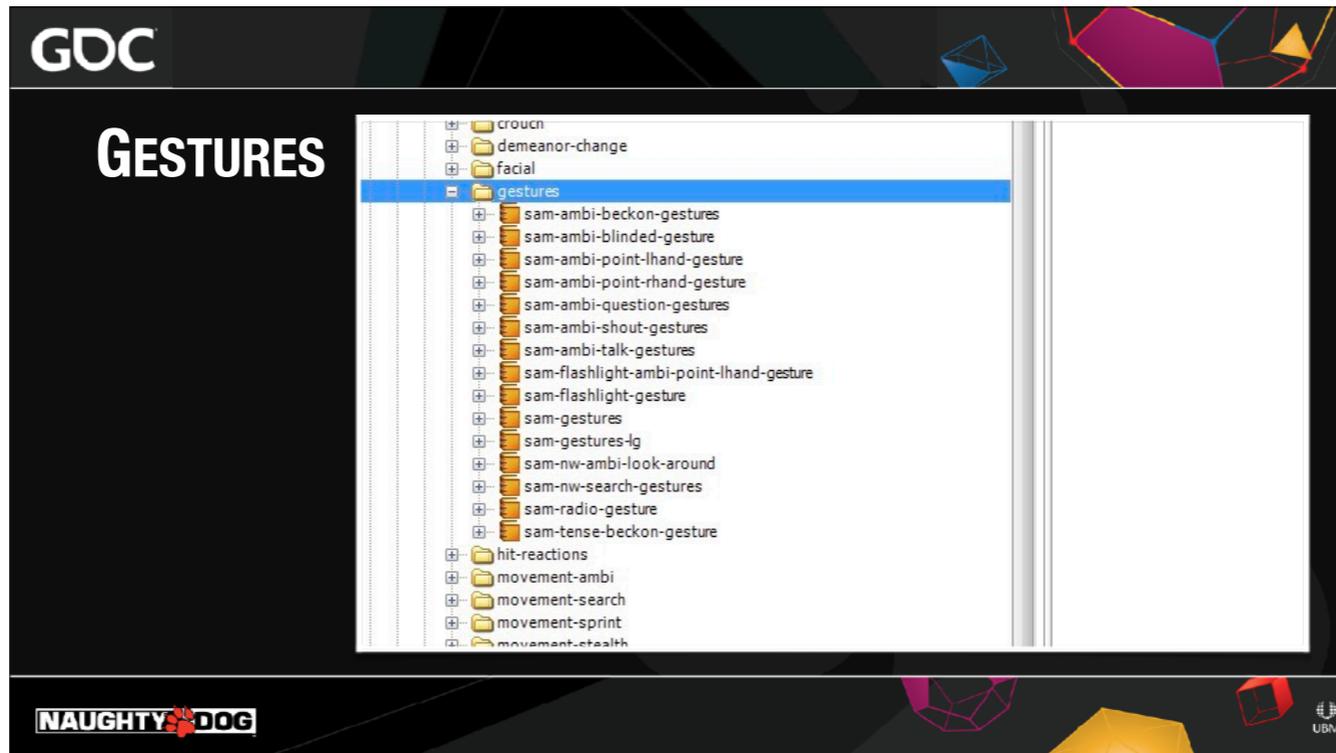
But now we employ an additional level of detail, **Gestures**. These are partial animations that play on top of normal gameplay animations, like a head shake, an arm pointing, a shrug, etc. The Player can be running, climbing, or crouching and these layers will usually still play.

****In case you're wondering why sometimes an arm isn't moving in that clip, that's because it's not part of the Animation's layer. Meaning the Player can be carrying a gun or other object, while the rest of the body does the Gesture.*

GESTURES

```
(vox-action vox-igc-sam-gam-sco-hillside-ruins-001
  (track ('gestures)
    (wait-gesture 'samuel 'sam-nw-ambi-talk-short-c-gesture)
    (wait 1.0)
    (clear-gesture 'samuel)
  )
  (track ('lookat)
    ;(look-at-object 'samuel 'player 'heada 3.0)
  )
)
;What's this place?
;-----
(vox-action vox-igc-drk-gam-sco-hillside-ruins-001
  (track ('gestures)
    (wait-gesture 'player 'hero-talk-i-gesture)
    (wait 1.5)
    (wait-gesture 'player 'hero-talk-e-gesture)
  )
  (track ('lookat)
    (look-at-object 'player 'samuel 'heada 3.0)
  )
)
;The monks had several living quarters... the main one being by the graveyard of course.
;-----
```

One of the ways we "sell" these moments is by **hooking a specific Gesture up to a line of dialogue in script**. So when each line plays, the Gestures play on top of whatever the character is doing. Programming and scripting magic also helps the speaking characters **actually look at each other dynamically**, when appropriate.



Since we don't record specific Gestures for every line, the final performance isn't as rich as a Cutscene might be. But the result is still an **added level of life that doesn't restrict the Player's movement** as they roam around the game world.

GDC

GESTURES

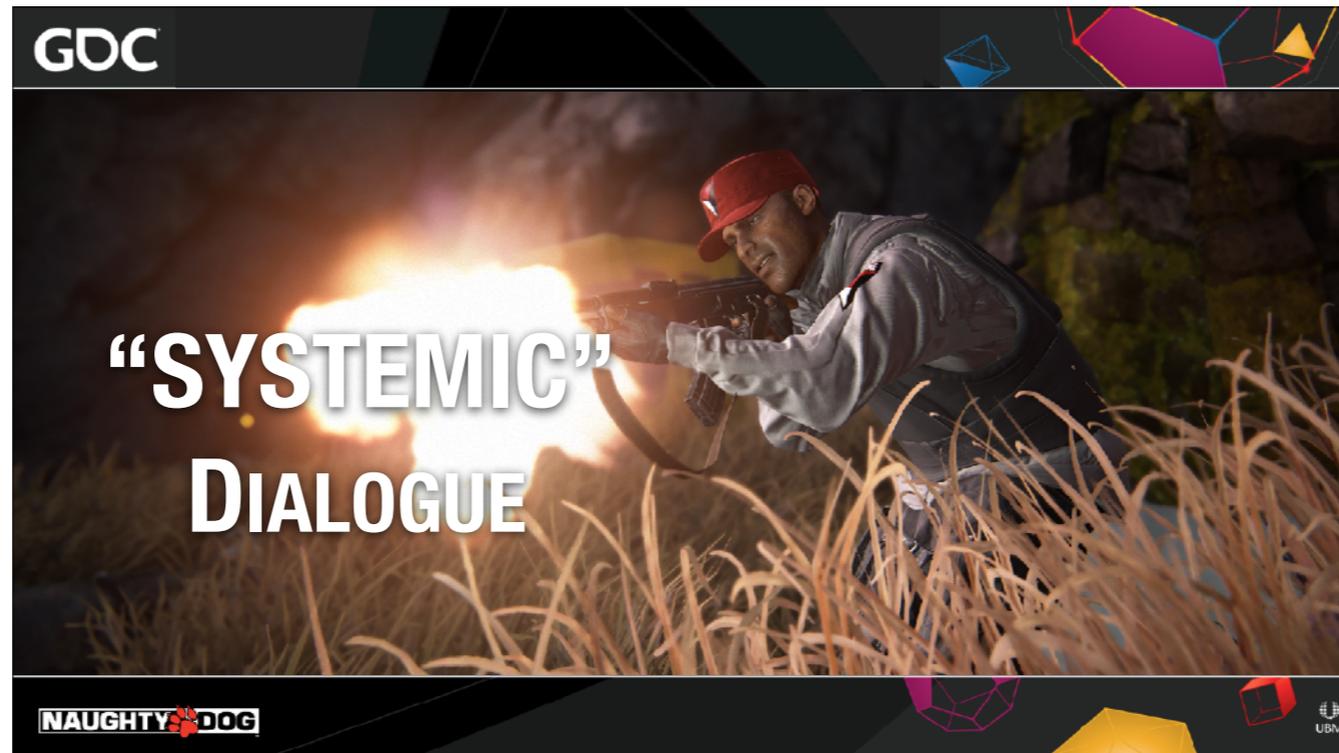


NAUGHTY DOG

UBM

Though we can also hook up custom **facial** gestures to lines in the same way, we usually don't go to the extra work—since the camera is normally behind the Player character's head, and far enough away from other speaking characters. By default we employ a neat **procedural system**, which generates lip sync and facial animations using the audio file's amplitude and subtitle text.

{PLAY} <https://youtu.be/qHm-WOf2Zlo>



Besides the story dialogue, we have another category of lines called **Systemic VO**. These are **groups of lines with similar context that can play when triggered by AI-driven events**. This material helps to add life, reinforce character relationships, and provide feedback in various situations throughout the game—mostly during types of gameplay scenarios that use repeated systems, like Combat.

SYSTEMIC DIALOGUE

“Buckets”



When an Enemy spots the Player, for instance, they have specific lines they use to call that out. ("There he is!"/"I see him!") These **"Buckets"**, as we call them, **offer multiple varieties that play based on the same situation**, so the Player doesn't just hear "I see them!" over and over and over.

****At the end of our Scotland demo, Sam called out one of his Systemic lines to indicate the Player is still hidden from the Enemy. The entire bucket consists of these lines:*

{PLAY} <https://youtu.be/CGKsgNMdqWQ>

GDC

SYSTEMIC DIALOGUE

- Enemies



NAUGHTY DOG

UBM

This sort of dialogue serves a practical function in terms of Player feedback, but it also keeps the characters alive and reacting to what's going on in the same way the Story lines do. Which is why we don't only use Systemic dialogue for our Enemies....

GDC

SYSTEMIC DIALOGUE

- Enemies
- Hero



NAUGHTY DOG

UBM

Any dialogue triggered by AI, rather than just script, falls into this category—including Buckets for any major characters: the Hero,...

SYSTEMIC DIALOGUE

- Enemies
- Hero
- Buddies



...their AI-controlled "Buddies",...

SYSTEMIC DIALOGUE

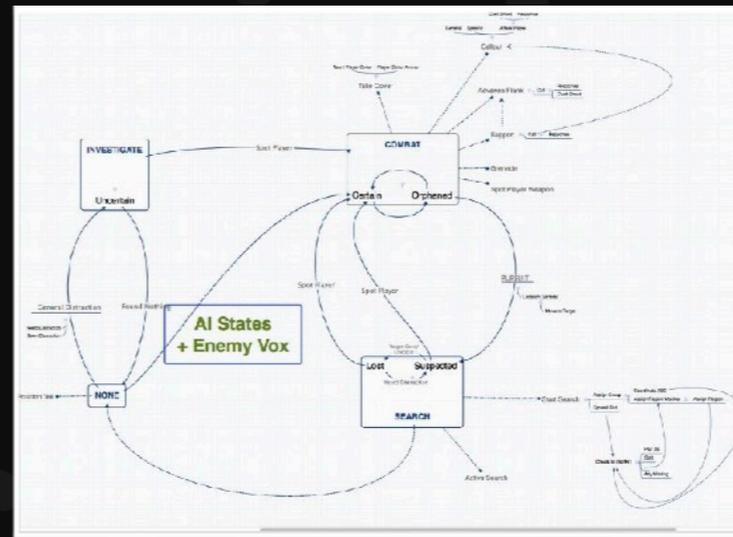
- Enemies
- Hero
- Buddies
- Multiplayer



...and of course all of our Multiplayer characters (since that mode is pretty much all combat mechanics).

SYSTEMIC DIALOGUE

• TENSION STATES



The system is controlled by the global **Tension State**, which we break down into 4 stages: **Unaware**, **Investigate**, **Search**, and **Combat**.

SYSTEMIC DIALOGUE

- TENSION STATES
 - Unaware



In **Unaware**, any threats nearby have no knowledge of the Player or their companions.

- Enemies can converse with custom, story-based dialogue, *like they did in the end of that Scotland clip*.
- The Player and his Buddies, meanwhile, will likely be in standard "Explore" mode. **This is the natural state of the game.** If they get close to Enemies in this state, Buddies and the Hero will use the Whispered versions of their various buckets, so the characters sound like they're trying to stay hidden.

GDC

SYSTEMIC DIALOGUE

• TENSION STATES

- Unaware
- Investigate



NAUGHTY DOG

UBM

In **Investigate**, tension rises a bit. The Enemies heard or saw some evidence of Player interference. They try to uncover the source of the distraction—now playing their Systemic buckets regarding what they saw, checking in if anyone saw anything, etc. **This is the first level of Tension where the Player would feel threatened**, and that they should either fight—or get the hell out of there.

SYSTEMIC DIALOGUE

• TENSION STATES

- Unaware
- Investigate
- Search



In **Search**, tension is near its breaking point because Enemies saw the Player, then lost track of them. They speak buckets of lines so the Player can audibly locate the Enemies attempting to converge on their position. Feedback from the Heroes remains whispered—including Buddies pointing out where the nearest Enemy is ("On your left." "Behind you.") or warning them if someone approaching is carrying a powerful weapon ("Lookout. Shotgun.").

SYSTEMIC DIALOGUE

• TENSION STATES

- Unaware
- Investigate
- Search
- Combat



Combat is when all hell breaks loose, and in our games uses almost exclusively Systemic dialogue. But since we want it to feel as nuanced as any quieter story moments, we employ a lot of buckets to cover a variety of potential situations.

GDC

SYSTEMIC DIALOGUE

ENEMIES
in Combat



NAUGHTY DOG

UBM

* **Enemies are aware of the Player**, and actively trying to attack him/her with guns, fists, or whatever other means they have. They have lines announcing when they are flanking, pointing out the Player's exact location, or warning each other if the Player has a power weapon like an RPG or Molotov Cocktail.

GDC

SYSTEMIC DIALOGUE

BUDDIES in Combat



NAUGHTY DOG

UBM

* **Buddies continue to warn the Player** the same as they do in Stealth, but instead of whispering, their lines are shouted over gunfire. **We also have dialogue that helps emphasize their relationship to the Hero**—i.e. that they care about them. Buddies ask if the Hero is okay after they've been shot, stumbled by an explosion, shout out that they're coming to the rescue if the Player is grabbed by an Enemy, and say "thank you" to the Player if ever they're rescued in return.

GDC

SYSTEMIC DIALOGUE

HERO
in Combat



NAUGHTY DOG

UBM

* **The Hero also has dialogue to connect the Player to their emotional state**, like the stress of diving out of the way of a grenade ("Oh god!") or steeling themselves up while reloading in cover ("Okay, here we go"). **There's usually something that plays after taking down an enemy as well.** In Uncharted, it's usually a funny quip that suits the tone ("Lights out!"), whereas in The Last of Us it matched the world's grittier nature (like an "Okay.").

SYSTEMIC DIALOGUE

• Personality Helps

SAM		SULLIVAN		ELENA	
Character	Dialogue	Character	Dialogue	Character	Dialogue
185	Sam (Forensic) Here we go.	185	Sullivan Let's get through this.	185	Elena Here we go again.
186	Sam All right, let's do this.	186	Sullivan Still, how safe?	186	Elena I can do this.
187	Sam Okay.	187	Sullivan How safe?	187	Elena It's right, I can do this.
188	Sam All right.	188	Sullivan Well, [Sully] Doc.	188	Elena [Sully] Steady.
189	Sam Right, steady...	189	Sullivan Oh great.	189	Elena Oh, now what?
190	Sam Ah, great.	190	Sullivan Steady.	190	Elena I'm not.
191	Sam Ha, Great.	191	Sullivan Okay, here we go.	191	Elena Oh no.
192	Sam I'm not.	192	Sullivan All right, Here we go.	192	Elena Well, doc's vi.
193	Sam (anticipatory exhale)	193	SULLIVAN CHECKING (HEALTH)	193	SULLIVAN CHECKING (HEALTH)
194	Sam Oh shit, Here we go.	194	Sullivan You good?	194	Elena You doing okay?
195	SULLIVAN CHECKING (DEFAULT)	195	Sullivan You good, Nate?	195	Elena You all right, Nate?
196	Sam you good?	196	Sullivan How're you doing?	196	Elena How're you doing?
197	Sam you good, Nathan?	197	Sullivan You okay, eh?	197	Elena Are you all right, Nate?
198	Sam How're you doing?	198	Sullivan Note, you okay?	198	Elena Note, you okay?
199	Sam you all right?	199	Sullivan You okay?	199	Elena Are you okay?
200	Sam You okay?	200	Sullivan You alright?	200	Elena You alright?
201	Sam How'd?	201	Sullivan You okay, Nate?	201	Elena You okay, Nate?
202	Sam How's mangle?	202	Sullivan PGL you alright?	202	Elena Note, you alright?
203	Sam How're we doing?	203	Sullivan How're you doing, Nate?	203	Elena How're you doing, Nate?

Since Systemic lines have a more functional purpose, they sometimes lack the subtlety or subtext that our longer conversations do. But they always maintain the same personality as the character delivering them, so that the Player doesn't become weary of hearing the exact same thing from multiple characters over and over.

{SLIDE}

*** For example, Sam calls our main character "Nathan" or "little brother" in a lot of his systemic warnings—and is more ball-busting in his tone—while Sully calls him "kid" and maintains a more paternal tone. Elena calls him "Nate," and has her own brand of...loving exasperation with our hero in her pattern of speech.

SYSTEMIC DIALOGUE

- Personality Helps
- Shuffle System

		Uncharted 4		Sam	
Time	Category	Text	Category	Text	Time
00:00:00	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:00
00:00:01	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:01
00:00:02	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:02
00:00:03	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:03
00:00:04	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:04
00:00:05	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:05
00:00:06	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:06
00:00:07	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:07
00:00:08	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:08
00:00:09	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:09
00:00:10	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:10
00:00:11	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:11
00:00:12	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:12
00:00:13	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:13
00:00:14	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:14
00:00:15	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:15
00:00:16	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:16
00:00:17	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:17
00:00:18	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:18
00:00:19	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:19
00:00:20	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:20
00:00:21	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:21
00:00:22	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:22
00:00:23	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:23
00:00:24	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:24
00:00:25	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:25
00:00:26	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:26
00:00:27	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:27
00:00:28	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:28
00:00:29	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:29
00:00:30	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:30
00:00:31	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:31
00:00:32	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:32
00:00:33	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:33
00:00:34	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:34
00:00:35	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:35
00:00:36	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:36
00:00:37	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:37
00:00:38	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:38
00:00:39	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:39
00:00:40	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:40
00:00:41	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:41
00:00:42	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:42
00:00:43	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:43
00:00:44	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:44
00:00:45	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:45
00:00:46	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:46
00:00:47	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:47
00:00:48	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:48
00:00:49	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:49
00:00:50	Sam	Sam: [Character Name]	Sam	Sam: [Character Name]	00:00:50

Even with personality thrown in, **the lines could still sound somewhat repetitive**. So we have a "**Shuffle**" system which keeps track of every line said by every AI group, advancing the queue for any one bucket across the board when they speak, ensuring that the same exact line will not be heard frequently.

**** If Enemies spot the Player, one might yell "I see him!" The next time that happens, rather than hear "I see him!" again, the Player will hear "It's him!" or some other variant. Not until the bucket has been exhausted by the shuffle system does it reset to the top again. We try to record 10-20 different lines per category that might be heard the most to avoid the Player hearing a repetition in any one play session.*

SYSTEMIC DIALOGUE

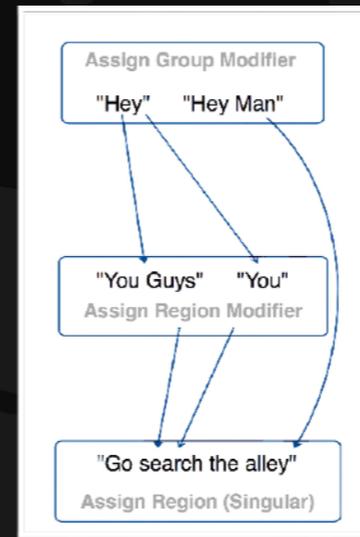
- Personality Helps
- Shuffle System
- Modular Lines

Name	State	Action	Priority	Script	Sound
Enemy 1	Idle	Look at player	1	Script 1	Sound 1
Enemy 1	Idle	Look at player	2	Script 2	Sound 2
Enemy 1	Idle	Look at player	3	Script 3	Sound 3
Enemy 1	Idle	Look at player	4	Script 4	Sound 4
Enemy 1	Idle	Look at player	5	Script 5	Sound 5
Enemy 1	Idle	Look at player	6	Script 6	Sound 6
Enemy 1	Idle	Look at player	7	Script 7	Sound 7
Enemy 1	Idle	Look at player	8	Script 8	Sound 8
Enemy 1	Idle	Look at player	9	Script 9	Sound 9
Enemy 1	Idle	Look at player	10	Script 10	Sound 10
Enemy 1	Idle	Look at player	11	Script 11	Sound 11
Enemy 1	Idle	Look at player	12	Script 12	Sound 12
Enemy 1	Idle	Look at player	13	Script 13	Sound 13
Enemy 1	Idle	Look at player	14	Script 14	Sound 14
Enemy 1	Idle	Look at player	15	Script 15	Sound 15
Enemy 1	Idle	Look at player	16	Script 16	Sound 16
Enemy 1	Idle	Look at player	17	Script 17	Sound 17
Enemy 1	Idle	Look at player	18	Script 18	Sound 18
Enemy 1	Idle	Look at player	19	Script 19	Sound 19
Enemy 1	Idle	Look at player	20	Script 20	Sound 20
Enemy 1	Idle	Look at player	21	Script 21	Sound 21
Enemy 1	Idle	Look at player	22	Script 22	Sound 22
Enemy 1	Idle	Look at player	23	Script 23	Sound 23
Enemy 1	Idle	Look at player	24	Script 24	Sound 24
Enemy 1	Idle	Look at player	25	Script 25	Sound 25
Enemy 1	Idle	Look at player	26	Script 26	Sound 26
Enemy 1	Idle	Look at player	27	Script 27	Sound 27
Enemy 1	Idle	Look at player	28	Script 28	Sound 28
Enemy 1	Idle	Look at player	29	Script 29	Sound 29
Enemy 1	Idle	Look at player	30	Script 30	Sound 30
Enemy 1	Idle	Look at player	31	Script 31	Sound 31
Enemy 1	Idle	Look at player	32	Script 32	Sound 32
Enemy 1	Idle	Look at player	33	Script 33	Sound 33
Enemy 1	Idle	Look at player	34	Script 34	Sound 34
Enemy 1	Idle	Look at player	35	Script 35	Sound 35
Enemy 1	Idle	Look at player	36	Script 36	Sound 36
Enemy 1	Idle	Look at player	37	Script 37	Sound 37
Enemy 1	Idle	Look at player	38	Script 38	Sound 38
Enemy 1	Idle	Look at player	39	Script 39	Sound 39
Enemy 1	Idle	Look at player	40	Script 40	Sound 40
Enemy 1	Idle	Look at player	41	Script 41	Sound 41
Enemy 1	Idle	Look at player	42	Script 42	Sound 42
Enemy 1	Idle	Look at player	43	Script 43	Sound 43
Enemy 1	Idle	Look at player	44	Script 44	Sound 44
Enemy 1	Idle	Look at player	45	Script 45	Sound 45
Enemy 1	Idle	Look at player	46	Script 46	Sound 46
Enemy 1	Idle	Look at player	47	Script 47	Sound 47
Enemy 1	Idle	Look at player	48	Script 48	Sound 48
Enemy 1	Idle	Look at player	49	Script 49	Sound 49
Enemy 1	Idle	Look at player	50	Script 50	Sound 50
Enemy 1	Idle	Look at player	51	Script 51	Sound 51
Enemy 1	Idle	Look at player	52	Script 52	Sound 52
Enemy 1	Idle	Look at player	53	Script 53	Sound 53
Enemy 1	Idle	Look at player	54	Script 54	Sound 54
Enemy 1	Idle	Look at player	55	Script 55	Sound 55
Enemy 1	Idle	Look at player	56	Script 56	Sound 56
Enemy 1	Idle	Look at player	57	Script 57	Sound 57
Enemy 1	Idle	Look at player	58	Script 58	Sound 58
Enemy 1	Idle	Look at player	59	Script 59	Sound 59
Enemy 1	Idle	Look at player	60	Script 60	Sound 60
Enemy 1	Idle	Look at player	61	Script 61	Sound 61
Enemy 1	Idle	Look at player	62	Script 62	Sound 62
Enemy 1	Idle	Look at player	63	Script 63	Sound 63
Enemy 1	Idle	Look at player	64	Script 64	Sound 64
Enemy 1	Idle	Look at player	65	Script 65	Sound 65
Enemy 1	Idle	Look at player	66	Script 66	Sound 66
Enemy 1	Idle	Look at player	67	Script 67	Sound 67
Enemy 1	Idle	Look at player	68	Script 68	Sound 68
Enemy 1	Idle	Look at player	69	Script 69	Sound 69
Enemy 1	Idle	Look at player	70	Script 70	Sound 70
Enemy 1	Idle	Look at player	71	Script 71	Sound 71
Enemy 1	Idle	Look at player	72	Script 72	Sound 72
Enemy 1	Idle	Look at player	73	Script 73	Sound 73
Enemy 1	Idle	Look at player	74	Script 74	Sound 74
Enemy 1	Idle	Look at player	75	Script 75	Sound 75
Enemy 1	Idle	Look at player	76	Script 76	Sound 76
Enemy 1	Idle	Look at player	77	Script 77	Sound 77
Enemy 1	Idle	Look at player	78	Script 78	Sound 78
Enemy 1	Idle	Look at player	79	Script 79	Sound 79
Enemy 1	Idle	Look at player	80	Script 80	Sound 80
Enemy 1	Idle	Look at player	81	Script 81	Sound 81
Enemy 1	Idle	Look at player	82	Script 82	Sound 82
Enemy 1	Idle	Look at player	83	Script 83	Sound 83
Enemy 1	Idle	Look at player	84	Script 84	Sound 84
Enemy 1	Idle	Look at player	85	Script 85	Sound 85
Enemy 1	Idle	Look at player	86	Script 86	Sound 86
Enemy 1	Idle	Look at player	87	Script 87	Sound 87
Enemy 1	Idle	Look at player	88	Script 88	Sound 88
Enemy 1	Idle	Look at player	89	Script 89	Sound 89
Enemy 1	Idle	Look at player	90	Script 90	Sound 90
Enemy 1	Idle	Look at player	91	Script 91	Sound 91
Enemy 1	Idle	Look at player	92	Script 92	Sound 92
Enemy 1	Idle	Look at player	93	Script 93	Sound 93
Enemy 1	Idle	Look at player	94	Script 94	Sound 94
Enemy 1	Idle	Look at player	95	Script 95	Sound 95
Enemy 1	Idle	Look at player	96	Script 96	Sound 96
Enemy 1	Idle	Look at player	97	Script 97	Sound 97
Enemy 1	Idle	Look at player	98	Script 98	Sound 98
Enemy 1	Idle	Look at player	99	Script 99	Sound 99
Enemy 1	Idle	Look at player	100	Script 100	Sound 100

Sometimes, the lines are written to be modular, so that they can be stitched together based on situation. Not only does this allow for variety in the simulation, but it makes the Enemies seem alive and intelligent.

SYSTEMIC DIALOGUE

- Personality Helps
- Shuffle System
- Modular Lines



*** In *The Last of Us*, an Enemy might say "Hey. You two. Go search over there." Each of those is a separate bucket of lines that plays back to back, **utilizing natural pauses to make them sound like complete, varied thoughts**. In another scenario, it might play as "Hey. You. Go check the alley." or some other variant.

SYSTEMIC DIALOGUE

- Personality Helps
- Shuffle System
- Modular Lines
- Varied Actors

Conversation Table	START	END	STATE	ACTOR	VOICE	EMOTION	ACTOR	VOICE	EMOTION	ACTOR	VOICE	EMOTION
1	00:00	00:10	1	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
2	00:15	00:25	2	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
3	00:30	00:40	3	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
4	00:45	00:55	4	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
5	01:00	01:10	5	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
6	01:15	01:25	6	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
7	01:30	01:40	7	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
8	01:45	01:55	8	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
9	02:00	02:10	9	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
10	02:15	02:25	10	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
11	02:30	02:40	11	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
12	02:45	02:55	12	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
13	03:00	03:10	13	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
14	03:15	03:25	14	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
15	03:30	03:40	15	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
16	03:45	03:55	16	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
17	04:00	04:10	17	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
18	04:15	04:25	18	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
19	04:30	04:40	19	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
20	04:45	04:55	20	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
21	05:00	05:10	21	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
22	05:15	05:25	22	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
23	05:30	05:40	23	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
24	05:45	05:55	24	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
25	06:00	06:10	25	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
26	06:15	06:25	26	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
27	06:30	06:40	27	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
28	06:45	06:55	28	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
29	07:00	07:10	29	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
30	07:15	07:25	30	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
31	07:30	07:40	31	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
32	07:45	07:55	32	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
33	08:00	08:10	33	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
34	08:15	08:25	34	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
35	08:30	08:40	35	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
36	08:45	08:55	36	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
37	09:00	09:10	37	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
38	09:15	09:25	38	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
39	09:30	09:40	39	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
40	09:45	09:55	40	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
41	10:00	10:10	41	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
42	10:15	10:25	42	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
43	10:30	10:40	43	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
44	10:45	10:55	44	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
45	11:00	11:10	45	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
46	11:15	11:25	46	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
47	11:30	11:40	47	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
48	11:45	11:55	48	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
49	12:00	12:10	49	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3
50	12:15	12:25	50	ACTOR_1	VOICE_1	EMOTION_1	ACTOR_2	VOICE_2	EMOTION_2	ACTOR_3	VOICE_3	EMOTION_3

One subtle way we keep things feeling more real is by **avoiding repetition not just in lines, but in the voices themselves**. Since we have a limited number of Actors voicing our NPCs, we try to make sure they have different voice types (medium, low, etc) so that the Player won't hear voices that sound the same over and over.

Also, as I mentioned, Enemies are often initially encountered while they're having a Story conversation customized to that particular group or area. **We keep track of which Actor's voice is being used in each conversation**, then try our best to not use that Actor in the next setup—further avoiding repetition.

SYSTEMIC DIALOGUE

- Personality Helps
- Shuffle System
- Modular Lines
- Varied Actors
- Interrupt-able



A tricky situation that then comes up with these Enemy conversations is **how to interrupt these lines that are already playing**. If the Player shows up in their vision cones, they have to switch to their Systemic dialogue and go into Combat. So we cut off a line, wait a split second, then just play the Systemic dialogue as if the Enemy had interrupted themselves voluntarily.

{PLAY} <https://youtu.be/Zn1jhCQ4CXI>



For a long time, this rough method was the only way we had to interrupt conversations. However, the addition of a drive-able vehicle in Uncharted 4—which the Player could exit at any time—meant **entire sequences of lines might be skipped just because the Player wanted to explore a little.**

INTERRUPTIONS

Interruption
System 1.0

19	Sullivan	Uh, kid?	(ALT)		S11k			
20	Drake	Hold that thought. I'll be right back.			S1j			
21	Sullivan	We're stopping here?	(ALT)		S1mo			
22	Drake	Yeah, back in a sec.			S1pks			
23	Sullivan	Am I boring you?	(ALT)		S1rwa			
24	Drake	Sorry, Sully. Give me just a sec.			S1t, S2AD			
25	BEHAVIOR/SPEAKER-CRITICAL INTERRUPT							
26	Drake	{interrupting himself} Wait...	While a character is talking, they sometimes interrupt themselves to do something more critical, urgent, or fun and they interrupt themselves.	(ALT)	26abcd			
27	Drake	..Huh?			26efgh			
28	Sam	{interrupting himself} Uh, wait.	When talking.		26jk			
29	Sam	Wait a sec.	(ALT)		26lmn		26n improv run	
30	Sullivan	{interrupting himself} Hey, wait.	When talking.		41mnc, 42ab			
31	Sullivan	Hey...	(ALT)		41gh, 42ab			
32	BEHAVIOR/SPEAKER-CRITICAL INTERRUPT							
33	Drake	Hold that thought.	While a character is talking, they sometimes interrupt themselves to do something more critical, urgent, or fun and they interrupt themselves.	(ALT)	27abc		NO-dst	
34	Drake	Wait.			27defgh			
35	Sam	Hold up.	While a character is talking, they sometimes interrupt themselves to do something more critical, urgent, or fun and they interrupt themselves.		27ijk			

This forced us to come up with a more elegant solution for interrupting—and resuming—dialogue between Nate and his Buddies, ensuring conversations couldn't so easily be lost forever.

- We recorded more "buckets" of lines regarding—and responding to—the Player stopping the 4x4 and exiting, then attempting to resume the conversation upon return.

INTERRUPTIONS

Maintaining
Tone

- To keep things in line with our story dialogue, **the tone of these interrupts had to be different**, depending on the nature of the characters' current relationships.

*** *In the plains of Madagascar, Nate is comfortably exploring with Sully and Sam, so his tone is more casual.*

{PLAY} https://youtu.be/B_rL8xH0uD4

GDC

INTERRUPTIONS

Maintaining
Tone



NAUGHTY DOG

UBM

*** On the Libertalia island, Nate and Elena's relationship is strained, so he's more subdued when he hops out of the car.

{PLAY} <https://youtu.be/enfZxvYGqvU>

GDC

INTERRUPTIONS

Glottal
Stops



NAUGHTY DOG

UDM

- To make it sound natural when the character stopped speaking, we had the Actors record "glottal stops"—the sound a person's throat makes when it stops speaking. These would play to cut off their lines in as natural a way as possible.

{PLAY} https://youtu.be/Y_Y-GS0OwfA



There's one last category of dialogue to cover briefly. **Efforts!** Besides during those Wild Takes we get at mocap, we record lots and lots and LOTS of Efforts—of various types—with each of our Actors.

- Mostly because **they give feedback to the Player while also helping the characters come alive**, selling all those physical situations like climbing, fighting and...well, *dying* that happen in our games.

GDC

EFFORTS!



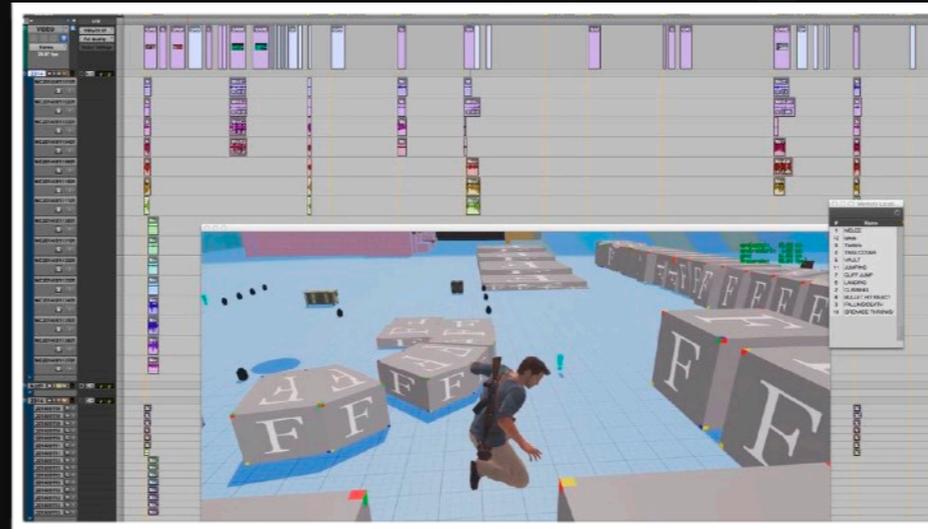
NAUGHTY DOG

UBM

- **Just having breathing from the characters**, especially in situations that are tense, or where they're fatigued, also **helps give a sense of what a character is feeling** without them having to state it.

GDC

EFFORTS!



NAUGHTY DOG

UBM

When recording, we have Actors chase videos of the Player grappling, fighting and falling—so they have context for the sounds they're making. We often get different sizes—small, medium and/or large—of each sound, and play the appropriate ones based on the intensity of the animation.

EFFORTS!

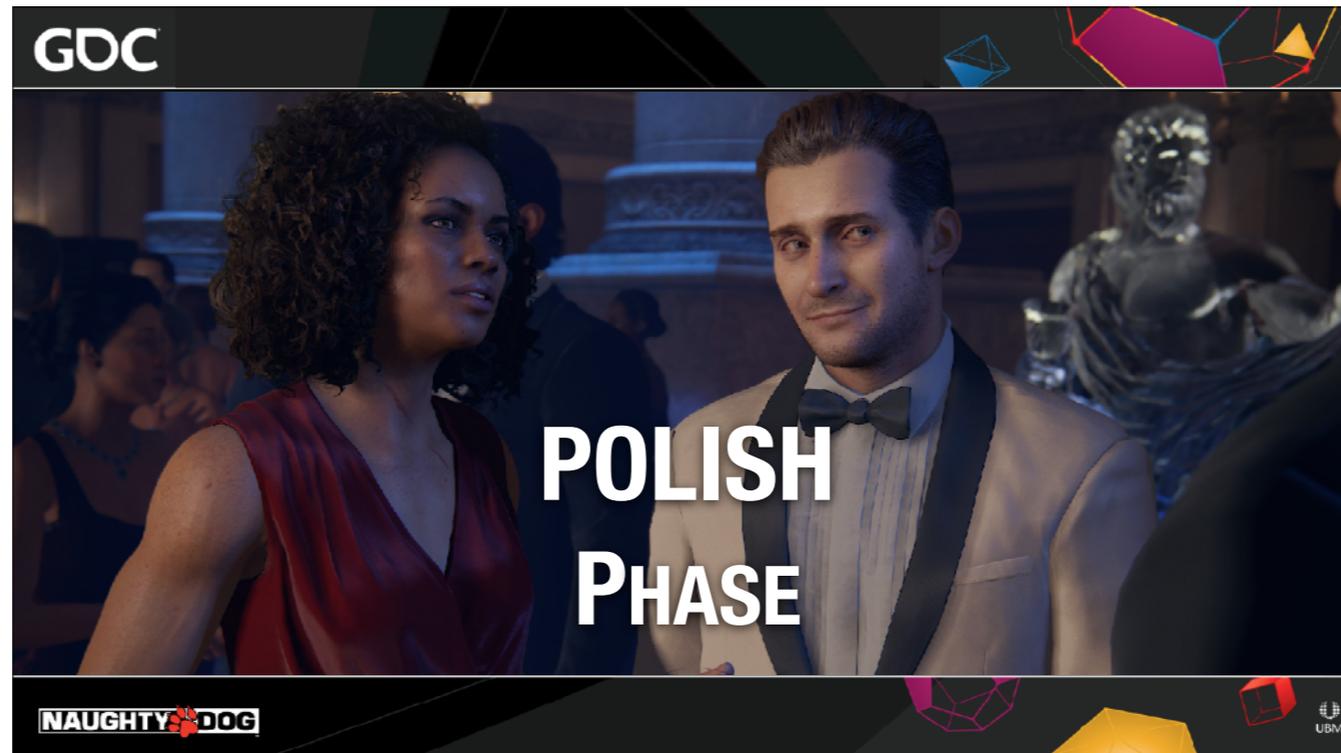
SESSION TWO:
(282 lines, 199 projected)

- Outscene_Dialogue_Enemies (12 lines) Spoken
 - sco-cave-eavesdrop - 11 lines
 - cav-rife-nadine-argument - 1 line
- NPC_Conversations:
 - Island-Arrival - Spo-jected (21 lines)
 - isl-epros-stealth-Already Recorded
 - isl-epros-stealth-2 - 12 lines
 - isl-epros-stealth-3 - 9 lines
 - Colony - Spo-jected (37 lines)
 - cdl-ghost-exit - 11 lines
 - cdl-stadio-second - 8 lines
 - cdl-cliffs-first - 8 lines
 - cdl-cliffs-second - 10 lines
 - River - Spo-jected (14 lines)
 - rv-intro-stealth - 14 lines
 - Sunken-Ruins - Spo-jected (32 lines)
 - sun-lower-terrace-light - 24 lines
 - sun-upper-terrace-snipers - 8 lines
- Pursuit - Projected (93 lines)
 - Location - General - Plural - 11 lines
 - Move to Target Callie - 13 lines
 - Move to Target - Pick-Up - 9 lines
 - Move to Target - Split-Up - 9 lines
 - Target Gone - Group - 5 lines
 - Target Gone - Plural - 12 lines
 - Check-Ins - Plural - 4 lines
 - Spot Player (Secondary Sighting) - Solo - 6 lines
 - Spot Player (Secondary Sighting) - Group - 11 lines
 - Spot Player (Secondary Sighting) - Group

SESSION THREE:
(278 lines, 199 projected)

- Callout Spoken
 - Bed
 - Art
 - Drop
 - Swim
 - Go
 - Wait
 - Bar
 - Put
 - Turn
 - Chase
 - Copy
 - Take
 - Effort
- Investigate - Spoken (20 lines)
 - Investigate - Seen Distraction - 20 lines
- Search - Spoken (13 lines) and Spo-jected (18 lines)
 - Search - Seen Distraction - 13 lines - S
 - Search - Seen Distraction - 13 lines - SP
 - Search - Under Water Well - 5 lines - SP
- NPC_Conversations:
 - Scotland - Spo-jected (SP) and Projected (P) (88 lines total, 68 lines SP and 20 P)
 - sco-hillside-volley-combat - 2 lines - P
 - sco-hillside-ruins-combat-start - 6 lines - SP
 - sco-forest-forest-tutorial - 16 lines - SP
 - sco-forest-forest - 8 lines - SP
 - sco-forest-slide-puzzle - 13 lines - SP
 - sco-dormitory-escape - 10 lines - SP
 - sco-cliffs-explore-to-boat - 3 lines - SP
 - sco-cliffs-combat-start - 9 lines - SP
 - sco-cliffs-combat-cave-after-kill - 3 lines - SP
 - sco-cave-map-room-collapse - 1 line - P
 - sco-cave-map-room-landing - 2 lines - P
 - sco-cathedral-cave-hook - 4 lines - P
 - sco-cathedral-crane-end - 1 line - P
 - sco-escape-start - 10 lines - P
 - Boat-Chase - Projected (P) (4 lines)
 - boa-intro - 4 lines
- Search - Projected (10 lines)
 - Pursuit - Under Water - 5 lines
 - Pursuit - Under Water Unsure - 5 lines
- Combat - Projected (97 Lines)
 - Sco Ally Killed - 9 lines
 - Flanking - Group Announcement - 7 lines
 - Spot Weapon - Sniper Rifle - 5 lines
 - Taunt Player - Solo - 8 lines
 - Taunt Player - Cover - Solo - 4 lines
 - Combat Player - Suppressed - 9 lines
 - Combat - Grab Player - 10 lines
 - Combat - Grabbed Player Accid - 10 lines
 - Combat - Vehicle Taunt - 6 lines
 - Combat - Flanking - 8 lines
 - Combat - Grenade Tell - 6 lines
 - Combat - Dynamite Tell - 4 lines
 - Combat - Dynamite Incoming - 1 line
- Callout - Projected (7 lines)
 - Spot Player - 5 lines
 - Spot Player - Group - 2 lines
- Callout Specific - Projected (27 lines)
 - Ship - 4 lines
 - Beach - 4 lines
 - Crow's Nest - 1 line
 - Log - 2 lines
 - Treesops - 2 lines
 - Cage - 4 lines
 - Scaffolding - 6 lines
 - Headstone - 4 lines
- Efforts - Mixed Levels
 - Stalo (2 types):
 - Drop-Kicks (Taking)
 - Jump Tackles (Taking)
 - Obey (3 types):

And, as most efforts are vocally stressful, we always record them at the end of a session. In fact, we do the same with any shouted material, so we don't blow out an actor's voice in the first hour.



So! As all of these systems and animations start coming together, that's when the glut of minor [and major] **changes** truly start. A Cutscene or a conversation might work in a vacuum, but **it's not until we get these pieces into the game can we truly judge what works.**

GDC

POLISH PHASE



NAUGHTY DOG

UBM

It's about getting it "on the stick" and feeling it out, and then making sure the performances remain consistent despite the adjustments. We continually tweak, swap, and rearrange our dialogue and animation—sometimes over the course of years—all to improve the emotional connection between the Player and what's going on around them.

GDC

POLISH PHASE

- Emotion



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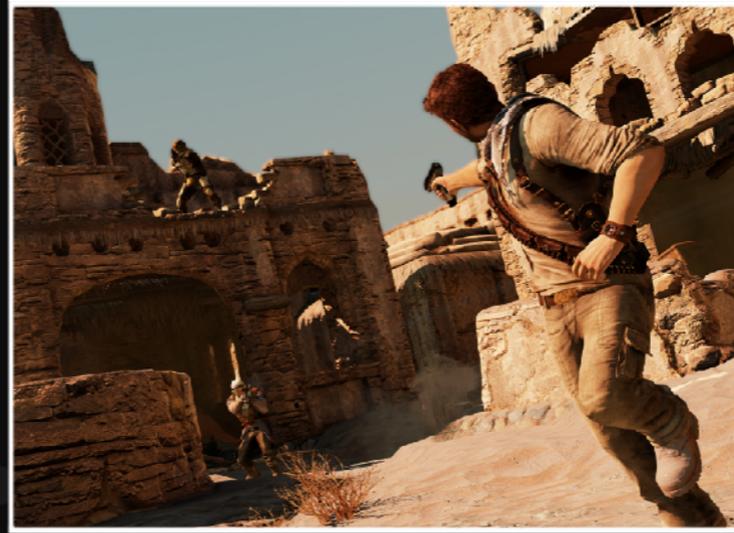
UBM

- First and foremost, **not all the content we write and record "works"** in the final context of the game. Even if nothing has changed in Design or Animation, **sometimes the emotional beat feels false**. IF possible, we'll alter that VO with an edit. By adding pauses, or stealing a breath, sigh or laugh from somewhere else and cobbling it onto the line, it can really help **make moments more natural**.

GDC

POLISH PHASE

- Emotion
- Tone



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UBM

- Our Systemic dialogue might have similar problems when working in context. Sometimes an **AI bucket will fire in a situation that's tonally inappropriate**. Like Nathan Drake's bucket of quips that he might spout off anytime he knocks a dude out. If the tone of the game is more serious in that moment, our Designers flag the area to suppress all that VO until it's appropriate for it to play later in the game. The same goes for the Buddies's systemic dialogue.

GDC

POLISH PHASE

- Emotion
- Tone
- Continuity



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- Another possibility is that a **small—or not-so-small—bit of exposition might need to change**. Sometimes it's contained in a cutscene, others it's a gameplay line whose context was altered in Design. Usually something this specific can't be fixed with an edit—a new line needs to be recorded.

GDC

POLISH PHASE

- Emotion
- Tone
- Continuity
- Clarity



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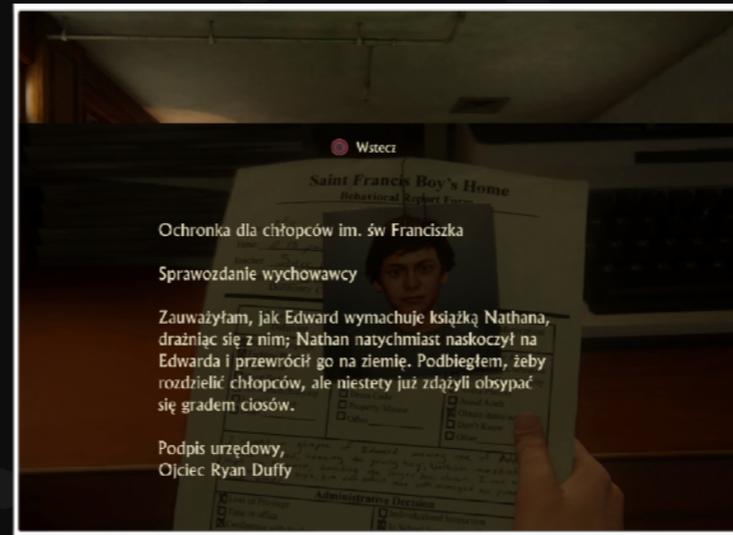
• There are also times when a line is making things confusing, so it **just has to go**. We hold many Focus Tests to determine where the pacing drags, augmenting or cutting as needed to hit the ideal amount of gameplay between story beats.

Since we over-write our levels anyway, **we can usually afford to cut part—or all—of an exchange**, and move another bit of dialogue in to fill the hole if necessary.



All of these adjustments make the game better. But...**we also have limits on what we can change**. As a project draws to a close, the first hard wall we hit is **Localization**.

LOCALIZATION



Localization, for those that might not know, is **the process of translating and re-recording all text and dialogue into dozens of languages** for international Players.

Games at some point have to lock, recording no more new lines and writing no more new text so that the existing material can go through this process in time for shipping.

LOCALIZATION



- This phase is when those generic "CYA" lines become **really** handy. We can use them to "patch" areas of the game that evolved after the deadline.
- *Need to direct the Player's attention at the solution to a puzzle? "Hey, look at this."*
- *Does a character shout out "This way! C'mon!", but you want to sell that their Buddy is following? Add in a "Right behind ya!" response.*

This type of dialogue has become so essential, we intend to record even more lines like it on future projects.

GDC

LOCALIZATION

To Stealth or
Not to Stealth?



NAUGHTY DOG

UBM

{SILENT} <https://youtu.be/0QOy2QL0Rss>

*** Like on Uncharted 4, we didn't know if the kids' escape in the "Manor" flashback would feel better as a tense stealth sequence, or a balls-to-the-wall chase from the police. We had recorded dialogue to support both scenarios (as time was running out), **but most of it was for the stealth version**. Turns out, what worked best was the latter. We ended up covering the majority of the chase using CYA Lines.

The screenshot displays a localization management interface. On the left, a sidebar lists various languages including Arabic, Braz. Portuguese, Trad. Chinese, Simpl. Chinese, Czech, Danish, Dutch, Finnish, French, German, Greek, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, So Am Spanish, Spanish, Swedish, Turkish, and UK English. The main area shows details for a specific localization entry: '2016-01-04-Vox-Gameplay-Open-Water'. It includes fields for 'Date Added' (1/4/2016 6:03:50 PM), 'Name', and 'Notes'. Below this, there is a section for '284 Recordings' with filters for 'Reverse ATE' and 'Vox Generation'. A list of recordings is shown, each with a file name, a date, and a time. The recordings include 'SAM_GAM_OPE_BOAT_EXPLORE_CAVE_BEACH_PU_001' (12/24/2015 4:05:37 PM), 'SAM_GAM_OPE_BOAT_EXPLORE_CAVE_BEACH_PU_002' (12/24/2015 4:05:37 PM), 'DRK_GAM_OPE_BOAT_EXPLORE_CAVE_BEACH_PU_001' (12/24/2015 4:05:37 PM), and 'SAM_GAM_OPE_BOAT_EXPLORE_FIND_SYMBOLS_PU_001' (3/8/2016 7:40:28 PM). On the right side, there are buttons for 'Upload All to LAMS', 'Upload Script to LAMS', 'Check Out Recordings', 'Cancel Uploads', and 'Export Batch'. The Naughty Dog logo is at the bottom left, and the UDM logo is at the bottom right.

- But sometimes, CYA lines aren't enough. We **need something specific**, and have to **borrow lines** from another part of the game.

So we go digging through our database to see what we have that can cover the request. When picking the line that will be duplicated, **we take into consideration how far apart the new instance is from the original place the line plays**, so that—again—the Player won't notice a repeat.

LOCALIZATION

Covering Scenes
that didn't exist...



*** Like this moment in *The Last of Us* that was covered entirely through CYA lines, re-used Systemic dialogue, and a Story line of Ellie's from earlier in the game.

{PLAY} <https://youtu.be/QdBWbQiRsU8>

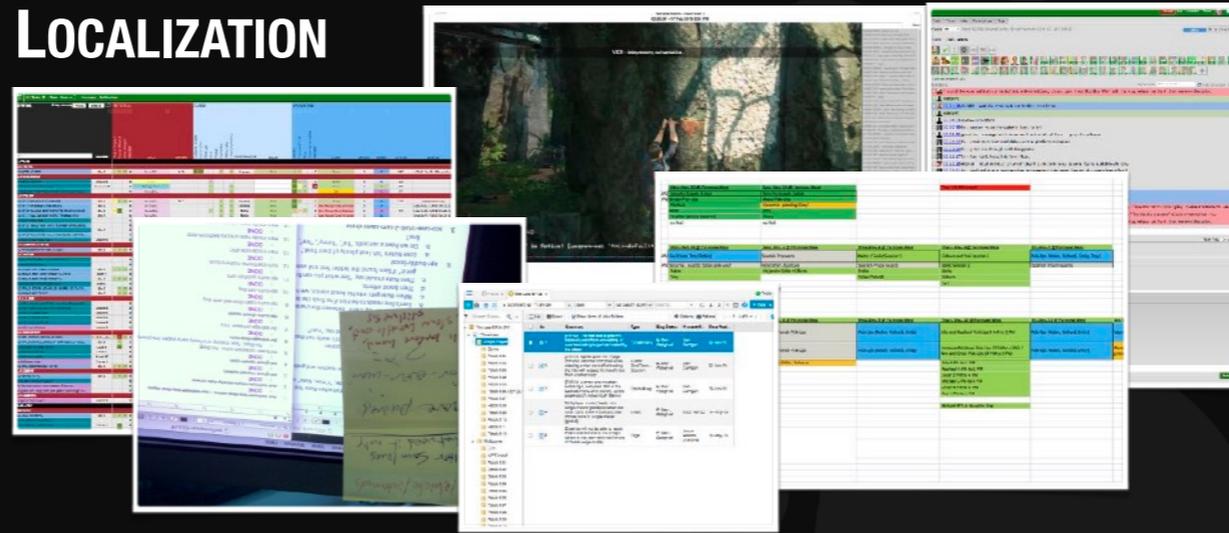
LOCALIZATION



- There are even times where we've had to change the precise timing of certain IGCs or Cutscenes last-minute, meaning the audio files returned from **all** the territories have to be **re-edited by hand** on our end.

GDC

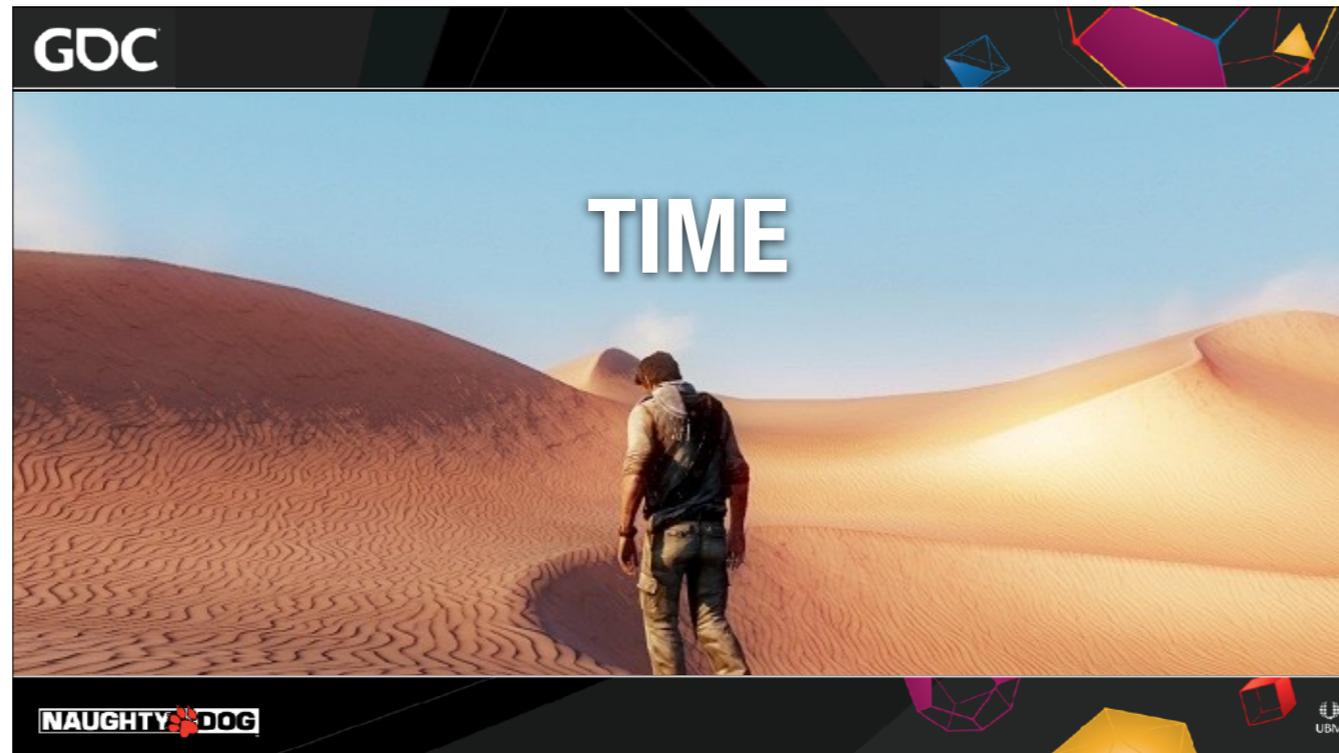
LOCALIZATION



NAUGHTY DOG

UDM

••• And, by the way, tracking all this madness—by any means necessary—is the biggest challenge of making things the "Naughty Dog way." The efforts of our minimal Production staff and various Leads are sometimes heroic.



But as we near the end of production, **the biggest limit on us is just time**. At a certain point, we can only use animations that we've captured or lines that we've recorded. If we don't have the material, and can't make it up, sometimes that means **living with tonal shifts**, or **big cuts of material** that we painstakingly shot and mocap-ed.

GDC



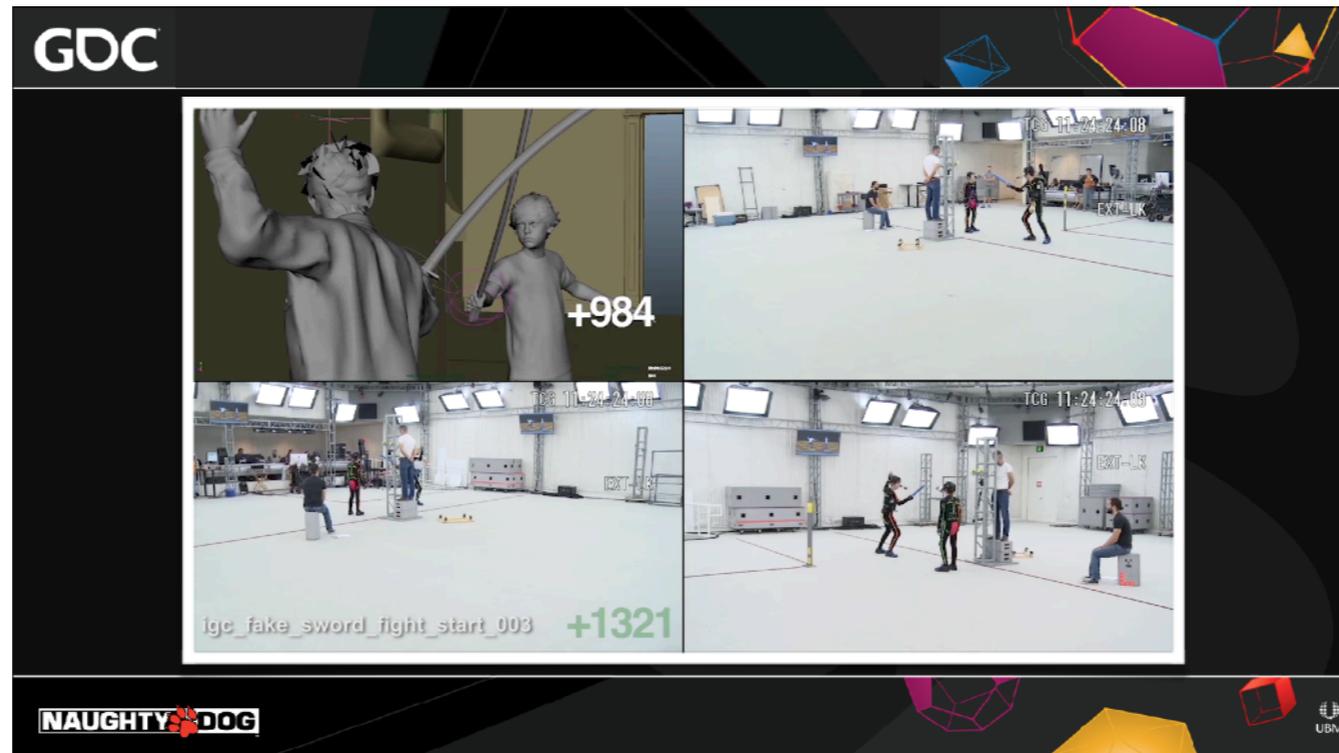
NAUGHTY DOG

UBM

{SILENT} https://youtu.be/YZ_2n3Y0WCA

*** Back on Uncharted 1, Design made a change to gameplay by **inserting combat into a sequence that was originally just quiet traversal**. Nate and Elena casually walked into an area and discovered a jet-ski. They weren't out of breath or recovering from a tense combat situation. But the gameplay **needed** a spike of energy and for the Player it worked, even though it caused a tonal mismatch with the Cutscene that followed.

Still, that late stage in the development process, we couldn't reshoot the scene. So this was logged as an example of how we could improve maintaining tone when going into a Cutscene in the future.



{PLAY} <https://youtu.be/52SnBtJioA>

*** On Uncharted 4, we were working on an epic sword fight near the end of the game. **And we'd planned to introduce those new mechanics during the Manor flashback with the kids.** We even mocap-ed and recorded a bunch of material to make it happen. But when we looked at the amount of work it would take to polish and script all those animations, and time we had left to finish everything in the game, our Directors made a hard call and cut it. **So the Player comes to the ending sword fight untrained,** and can possibly be emotionally divested from the sequence as they struggle to learn new mechanics near the end of the game.



But, if we catch an issue early enough, **it's been possible to make the hard choices required to maintain consistent tone and performances in a sequence that needs adjustment.**



*** Nearing the end of *The Last of Us*, one of our Designers pointed out a **big flaw** we'd overlooked. The Firefly Hospital culminated with a Cutscene where Joel charged into the operating room to save Ellie...

GDC



NAUGHTY DOG

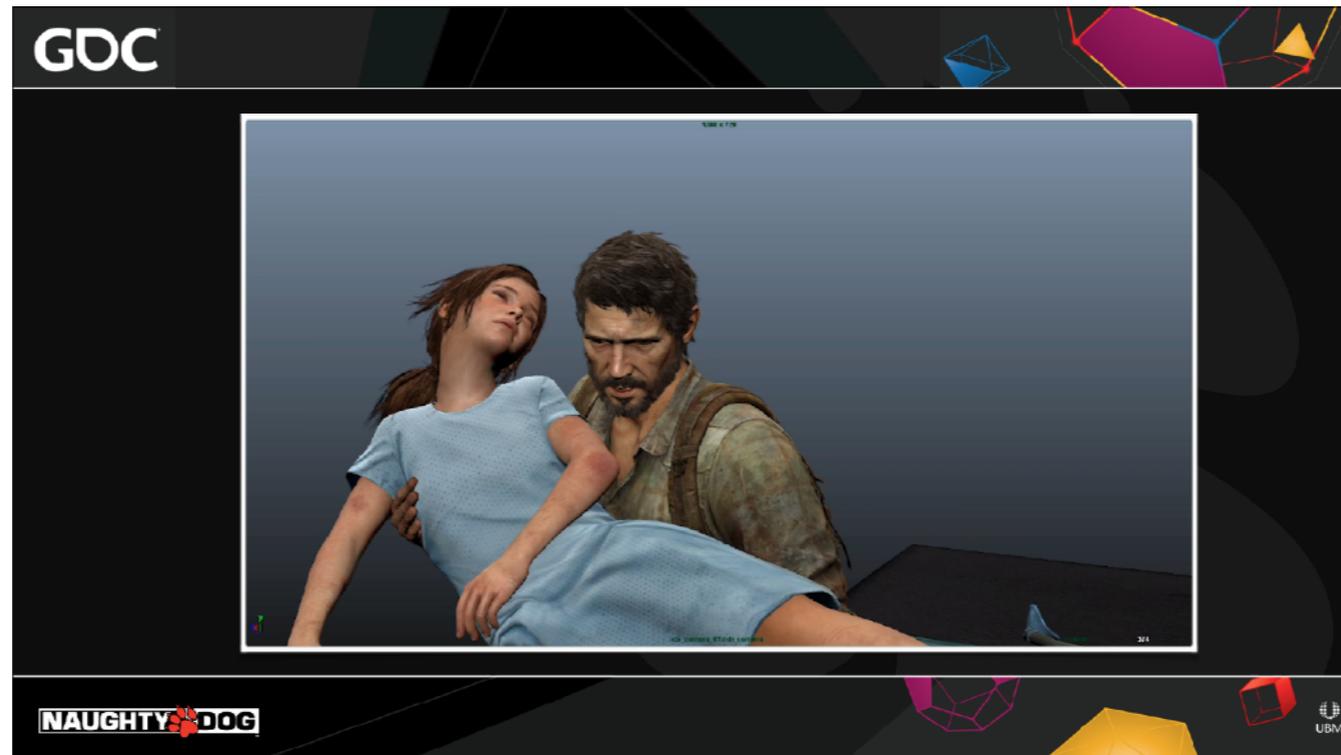
UBM

... In that scene, he kills the doctor (and eventually Marlene) right there, and then we smash-cut to him and Ellie driving away. It was a great Cutscene, and the performances we got of it, as-written, were excellent.



{SILENT} <https://youtu.be/1Uu62po67H4>

The problem was, as the Designer pointed out, that **the Player missed out on a big emotional payoff** that we hadn't even thought about. After carrying Joel's daughter at the beginning of the game, **the Player was set up to expect an echo of that event:...**



*...that Joel would be carrying Ellie to safety at the end, **redeeming some aspect his former loss.***

GDC



NAUGHTY DOG

UBM

So, with some hesitation, we looked at **what it might take to salvage what we could** from the existing Cutscene.

GDC



NAUGHTY DOG

UBM

By keeping the Marlene animation and just picking up Joel—now carrying Ellie—...



...we were able to move the main story beats of the Cutscene into the hospital parking garage.



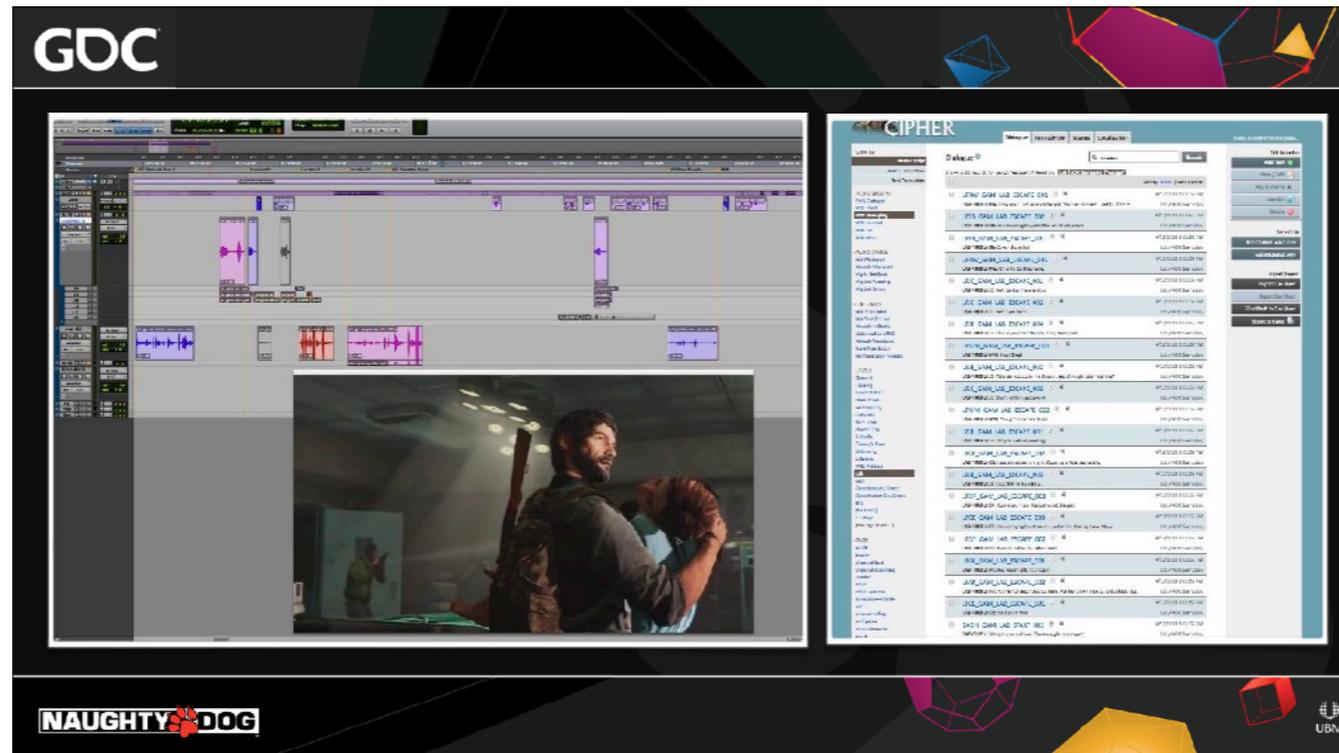
{SILENT} <https://youtu.be/iBr61n6OagI>

This allowed for a brand new ending sequence, with Joel carrying Ellie past dozens of Firefly soldiers—who we were assured would refrain from shooting Joel because, seriously, he was carrying the cure for mankind!



So that's what we recorded all our dialogue for. And then, after Localization locked, **it changed again!** **{SILENT}** https://youtu.be/nGCqViq_ME

There wasn't enough tension if Joel could just walk out of the hospital with Ellie, so the actions of the Firefly soldiers was revamped so they could attack him. **But that didn't match up with any of the dialogue we'd recorded!**



It took digging through NPC material we had recorded for other parts of the game to make this moment—and the performances in it—feel **as equally polished** as the others in the game.

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Ultimately, it was totally worth sacrificing some mocap and scrambling through folders of VO to create an experience that would **capitalize on Player empathy to that degree.**



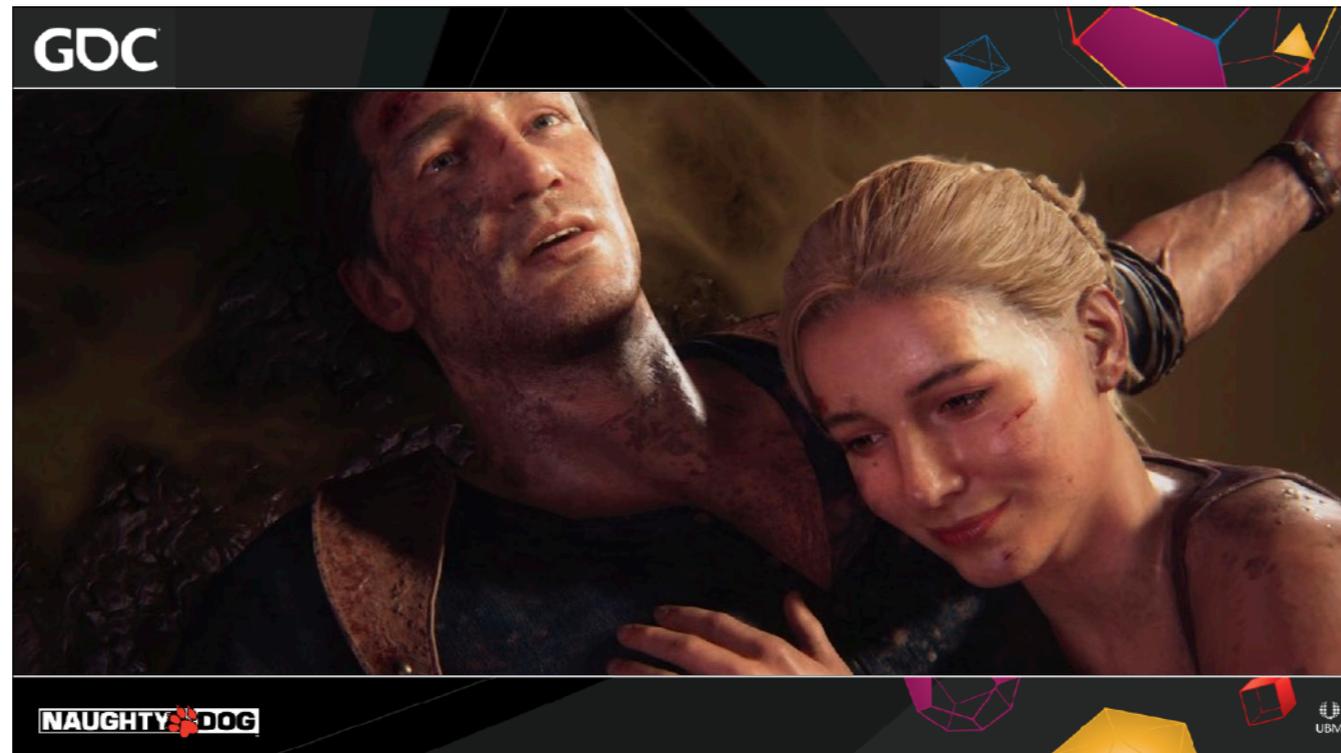
So...we do a lot of *crazy shit!*

And I'd just like to emphasize: the way we do it isn't the "only" way—or even the "right way"—to pull off realistic performances, especially depending on your Team size, budget, etc.

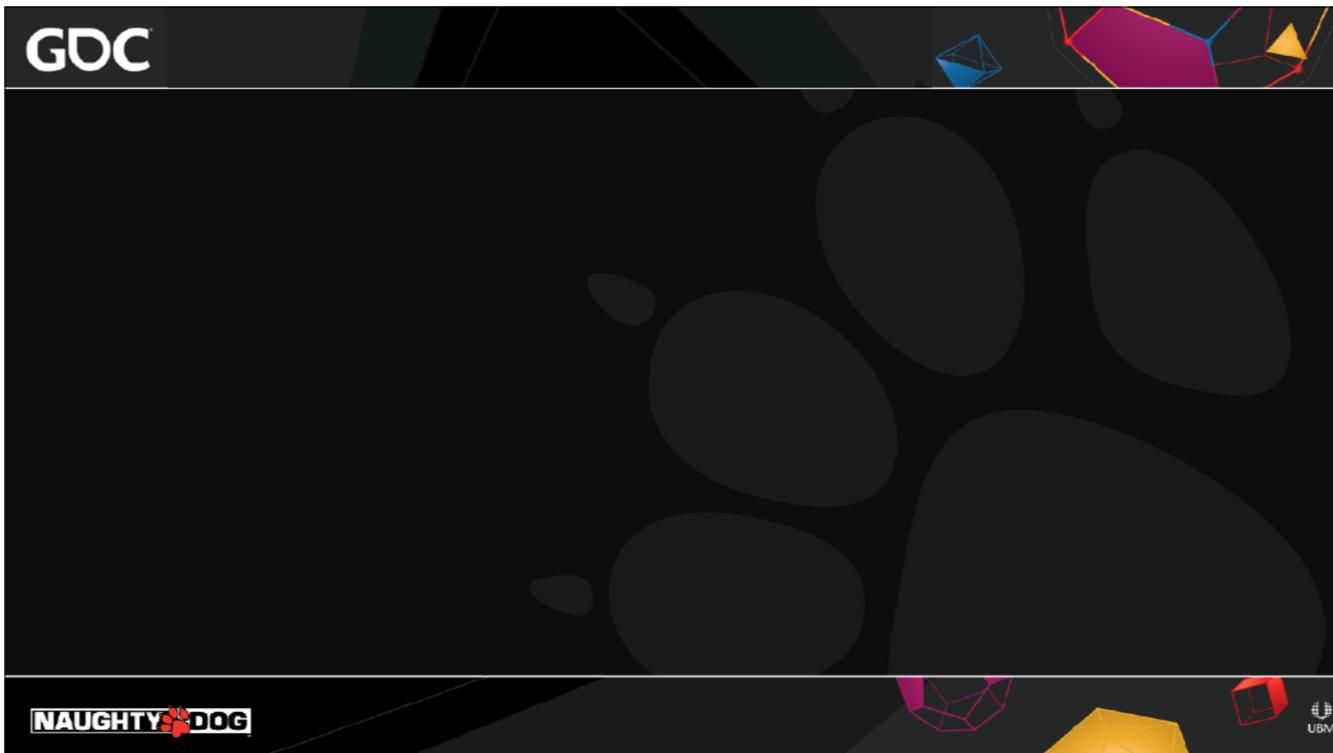
But, **the level of flexibility we allow for story and gameplay to influence each other during development** is why we feel we're able to strike a balance that we're proud of.



And it's also why executing these performances requires **constant collaboration and dedication from every discipline** on the Naughty Dog team. Writing, Acting, Rendering, Audio, Concept, Character, Programming, Animation, Design, Lighting, Production, even IT & Ops... it takes a veritable metropolis of talented men and women to make performances that the Player can *feel* when the controller is in their hands.



It's a constant struggle, but if we can truly move you—and maybe surprise you—then for us that's art worth making.



THANK YOU very much.