

Bringing Allies to Life in

# THE LAST OF US PART II

Bryan Collinsworth  
Michal Mach

**Bryan Collinsworth**  
**Game Designer**  
**@BBCollinsworth**





**Michal Mach**  
**Lead Animator**  
**@gameplayAnim**



Bringing **Ambient** Allies to Life in

# THE LAST OF US PART II

Bryan Collinsworth  
Michal Mach

# Basic Terms

## Ally

- Any friendly Non-Player Character (NPC) who accompanies the Player during gameplay.

## Ambient Gameplay

- Moments in the game where Player is in full control, but exploring or interacting with the world and story instead of engaging with Enemies.





## The Challenge

Groundbreaking high-fidelity character performances in cinematics meant NPC Ally Characters had to feel just as alive in moment-to-moment gameplay.





# The Challenge

More key story and character-building moments occur “on the stick” during gameplay — demanding versatility and responsiveness from Ally NPCs.



A person with a backpack is riding a brown horse through a grassy field. In the background, there are several tall, modern skyscrapers that appear to be in various states of ruin or overgrown with nature. The sky is blue with some clouds. The overall scene is a wide-linear environment from a video game.

# The Challenge

Highly-detailed wide-linear environments require Allies to be able to realistically explore with or guide the Player.





# The Challenge

More Ally characters than any previous ND game:  
11 humans and one dog!

# Pre-Existing Ambient Ally Systems

## Animations

- Limited library of motion captured performances (CAPs) that could only play at precise locations/ orientations in world. Hard to tune and players could easily “see the seams.”

## Explore behavior

- Allies could only progress through animated world-interactions randomly or in a loop; often appeared robotic or “possessed” (e.g. walking right in front of player without noticing).

## Lead behavior

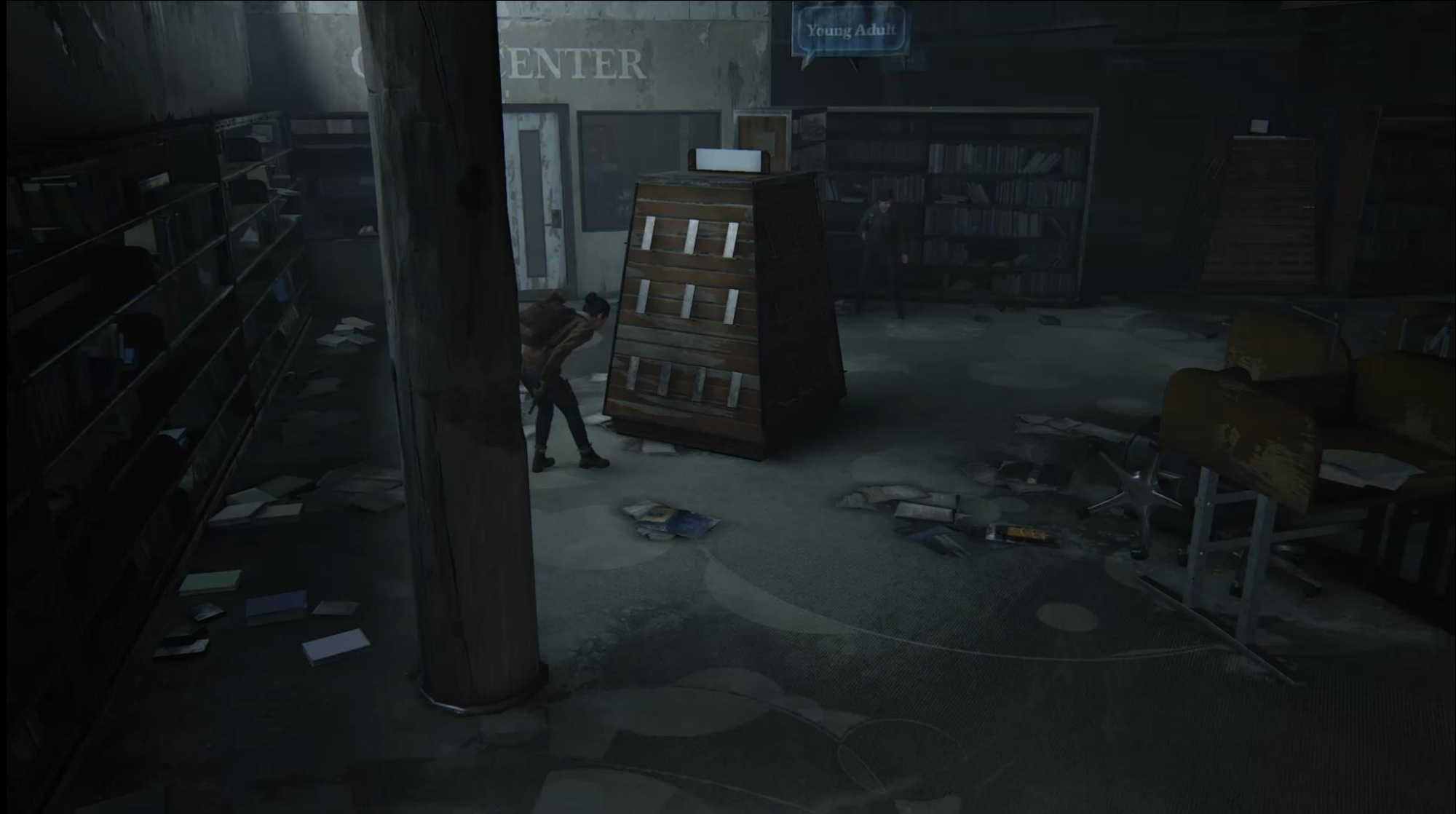
- Allies could lead player along limited spline paths, but struggled with hairpin turns, backtracking, keeping ahead of player, or stopping and waiting in natural places.

## In-motion awareness

- Moving NPCs could only react to the player or world using a head look-at system — falling far short of the complex full-body movements real humans do (e.g. walking backwards).



# Before: The Old Explore System



# Process

- Focused in on a handful of key moments where Ally behavior was especially important and limits of existing systems stood out.
- Compared Allies' existing in-game behaviors to how real humans move through, interact with, and explore spaces.
- Iterated toward goal of making Allies seem genuinely aware of their world and fellow characters during gameplay beats – alive and engaged.

**We'll discuss two of these moments today,** using them to illustrate the new systems and solutions we achieved in The Last of Us Part II.



A large museum hall with dinosaur skeletons. In the foreground, a large Triceratops skeleton is displayed on a raised platform. In the background, a Stegosaurus skeleton is visible on another platform. A person is walking on a path between the exhibits. The walls are made of stone and have some text on them, including "GIANT" and "STEGOSAURUS".

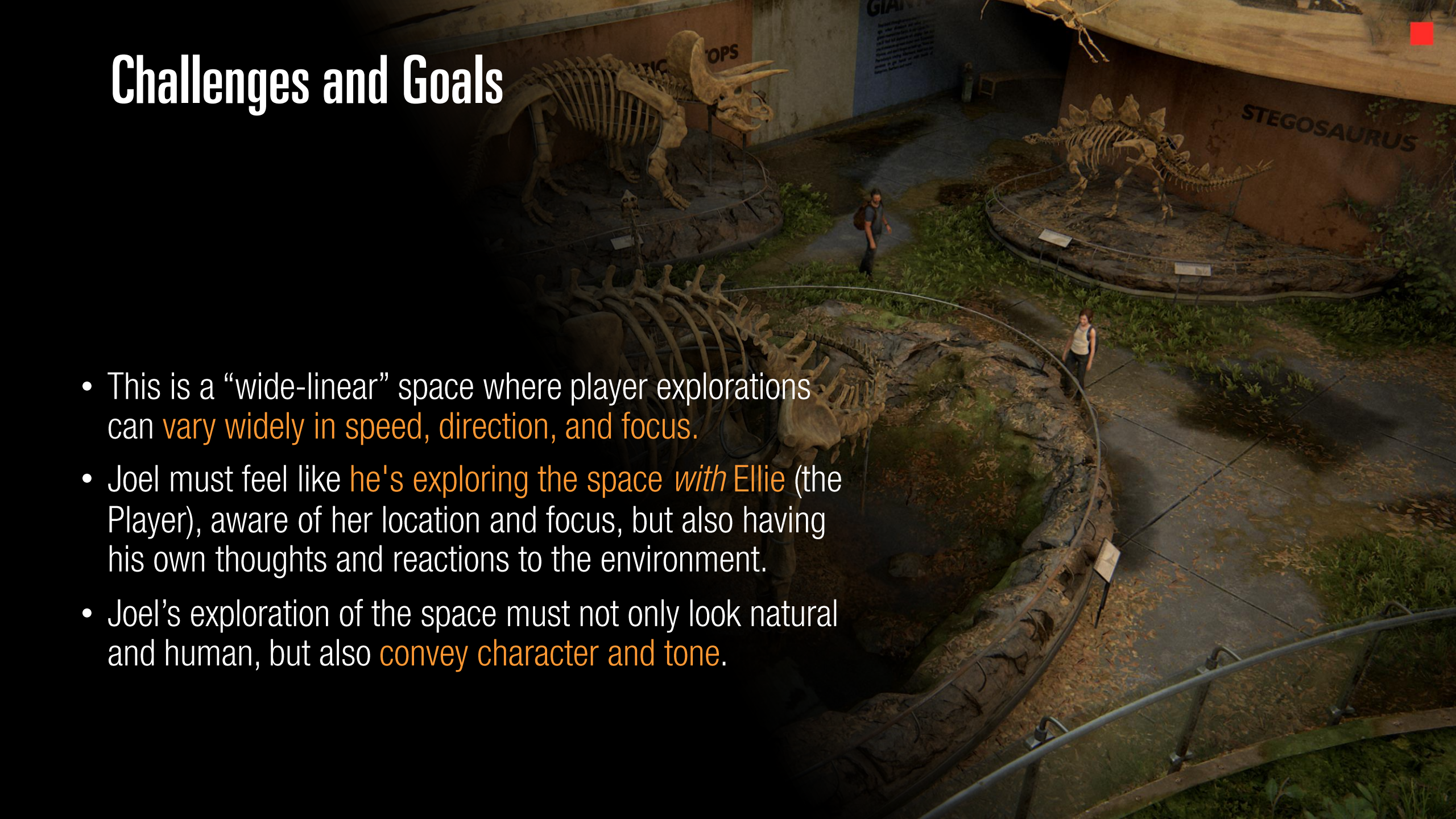
# The Museum

- Mocapped Performances
- Explore System
- Lookarounds



# Challenges and Goals

- This is a “wide-linear” space where player explorations can vary widely in speed, direction, and focus.
- Joel must feel like he's exploring the space with Ellie (the Player), aware of her location and focus, but also having his own thoughts and reactions to the environment.
- Joel's exploration of the space must not only look natural and human, but also convey character and tone.

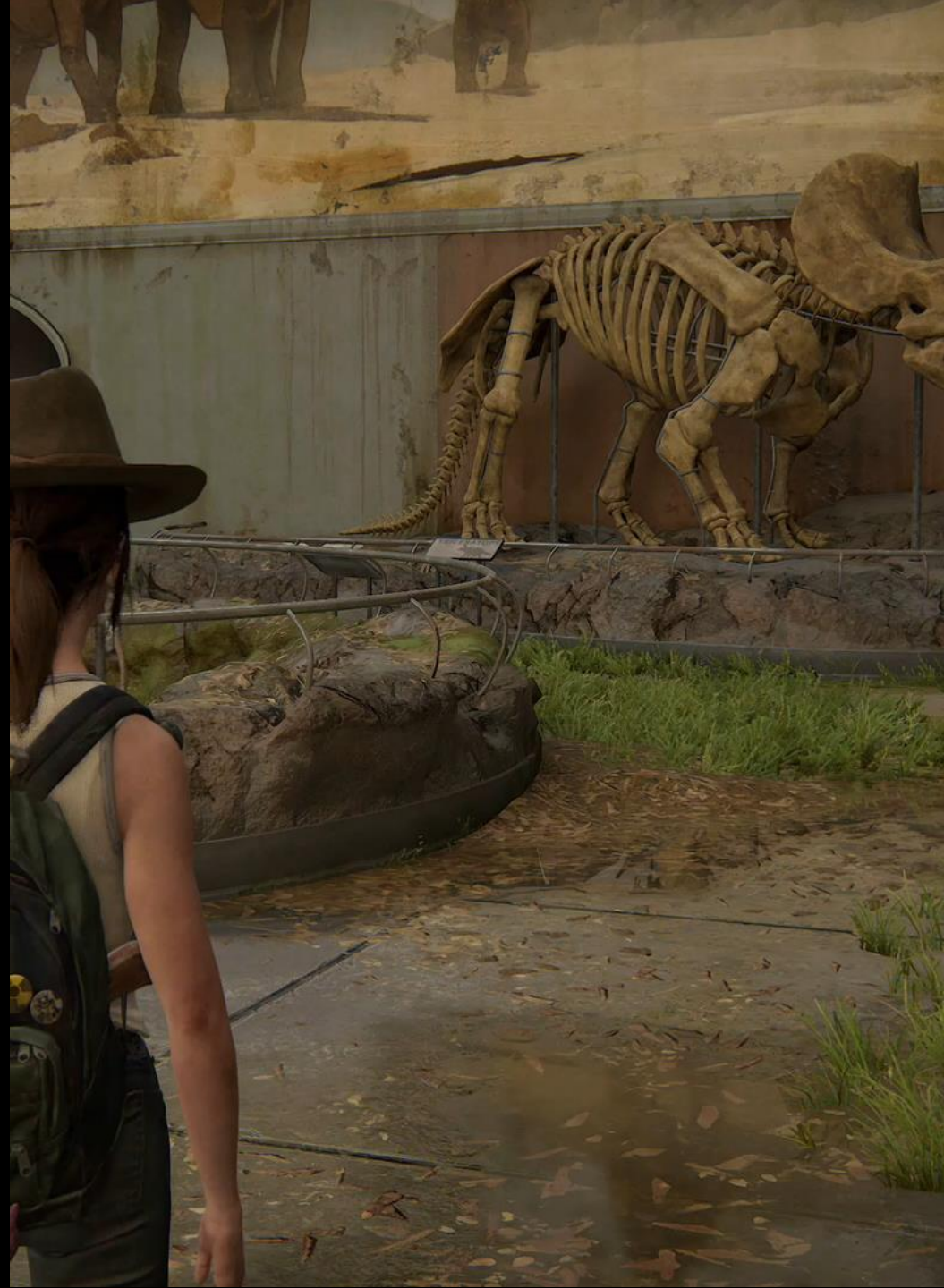




# Ambient Ally Performances

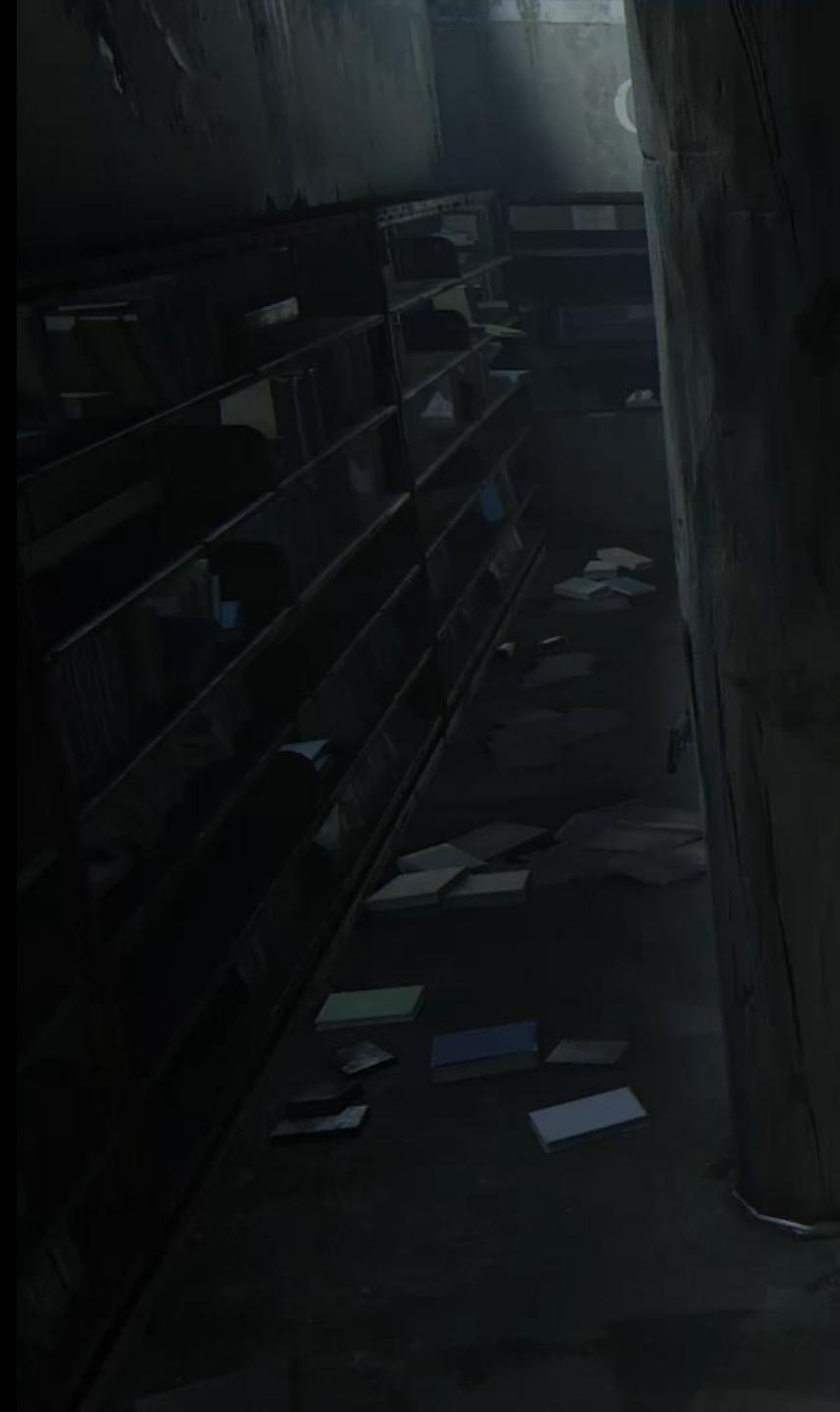
Motion-captured hundreds of brief animations (5-30 seconds)

- **Action Packs:** Performances that play at specific positions in the world and make Allies appear aware of their environment
- **Idle Performances:** “Internal” animations, more like traditional idles, but intended to convey tone of the moment and unique character of each Ally
- **Explore Walk:** More relaxed version of the default ambient walk that matches the energy of the performances better



# Cinematic Action Packs (CAPs)

- Suitable for performances where **NPCs interact with the environment**
- Require custom enter and exit animations therefore **expensive to author**
- **Require precise placement** in the levels which is time consuming
- **Limited reusability** due our organic environments and uniqueness of the performances





# Positional Action Packs

- Placed at locations and facing-directions that will **make Allies appear aware of world** when animation plays
- Ideally still “wobble room” so NPCs **don’t have to hit position or direction precisely** to look believable
- **Motion matching helps** Allies transition into a variety desired positions and facing-angles smoothly
- These performances are extremely **easy to author**
- They are **more ambient and less specific** than CAPs
- Over the course of development, we trended toward positional animations that allowed for **less precision & more versatility**



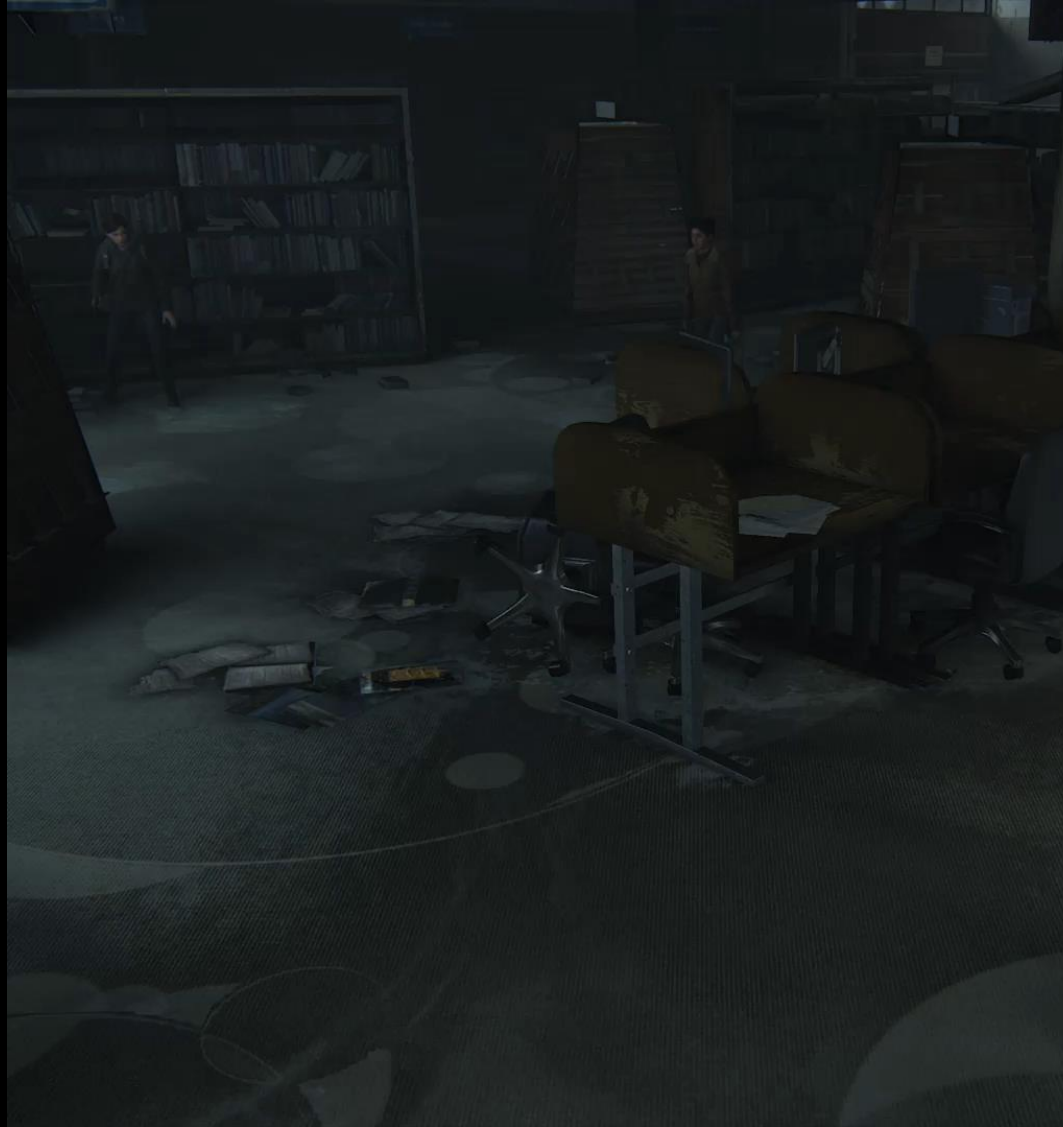
# Idle Performances

- Self-focused or “**internal**” – not reacting to the environment.
- Some world awareness still needed: Performances **look wrong when played too close to player**, facing a wall, etc.
- Performances ideally play in **open spaces** (middle of room).
- Captured many that could work for multiple Allies & game beats – but also **at least one unique idle per Ally**.





# Explore Walk





# The Explore System

- Now we needed to **link all these performances together** in a way that felt natural, realistic, and environmentally aware.
- **Breakthrough:** We already had a system that could do something like this for combat scenarios – the “**Post Selector**” system.
- We adapted post selection to drive Ally **exploration of ambient spaces**.



# The Explore System: Posts

## Explore Post Types

- Cinematic Action Packs
- Positional Action Packs
- “Wander” Posts (auto-generated open posts where idles play)





# The Explore System: Selectors

## Post-Selection Criteria: Examples

- Path Distance
- Facing Angle
- Distance from Walls/Blockers
- Avoid Recently Used
- Player Distance
- Path Passes Close to Player
- On-Screen?





**One more thing...**

# “Look-Around” Performances

- Allies still seem “possessed” if they suddenly turn and move directly toward a newly-selected Explore goal.
- Realized we needed animations to represent how humans do what the Post-Selector code was doing — searching for the most appealing place to go next.
- Captured a set of short transition performances specifically for this behavior, and for a variety of angles and directions.
- Once an Ally knows their next goal, they play an appropriate lookaround animation to “sell” the transition.






# Put It All Together — With Debug!







# The Aquarium

- Lead System
- Move Performances
- Behavior Transitions

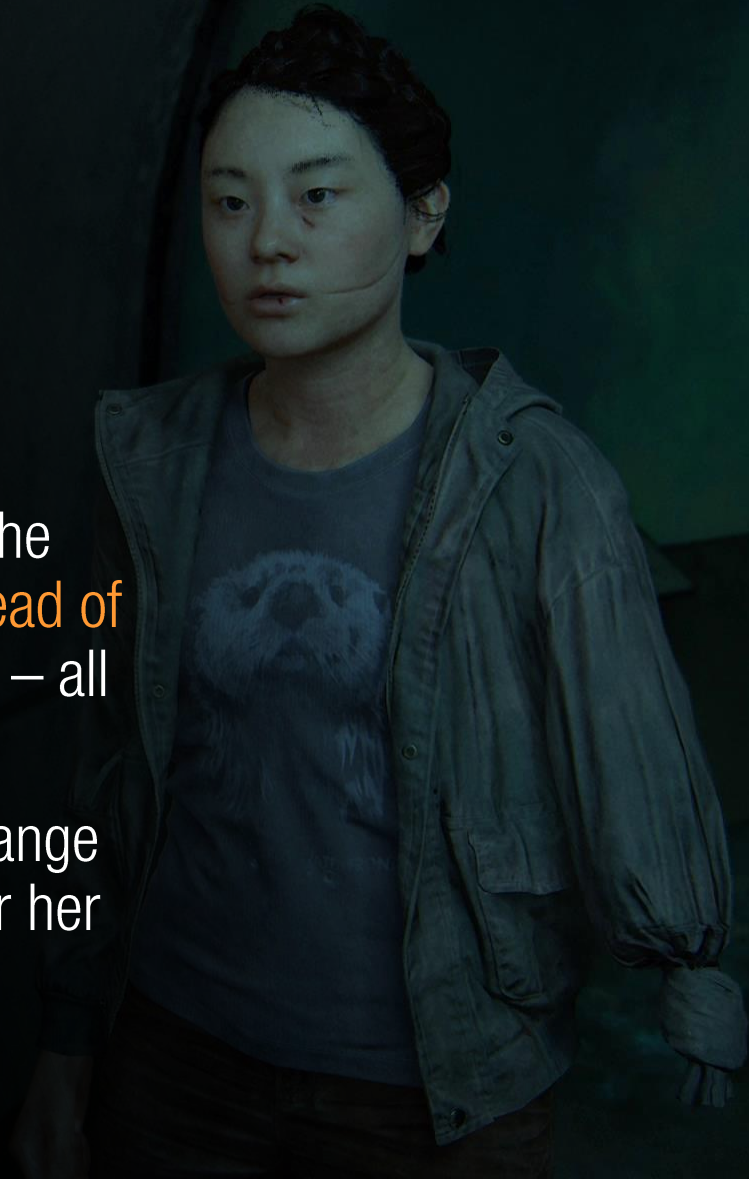


# Challenges and Goals

Ally Yara must appear to be **searching for her lost brother while staying engaged with the Player** (Abby).

The Player can keep moving at a constant pace through the level, or go slowly with frequent stops. **Yara must stay ahead of faster players, but naturally stop and wait for slower ones** – all without losing her sense of searching urgency.

Yara needs to be able to **turn while moving** to achieve a range of important story actions - searching rooms, whistling for her brother, and responding to Abby's questions.



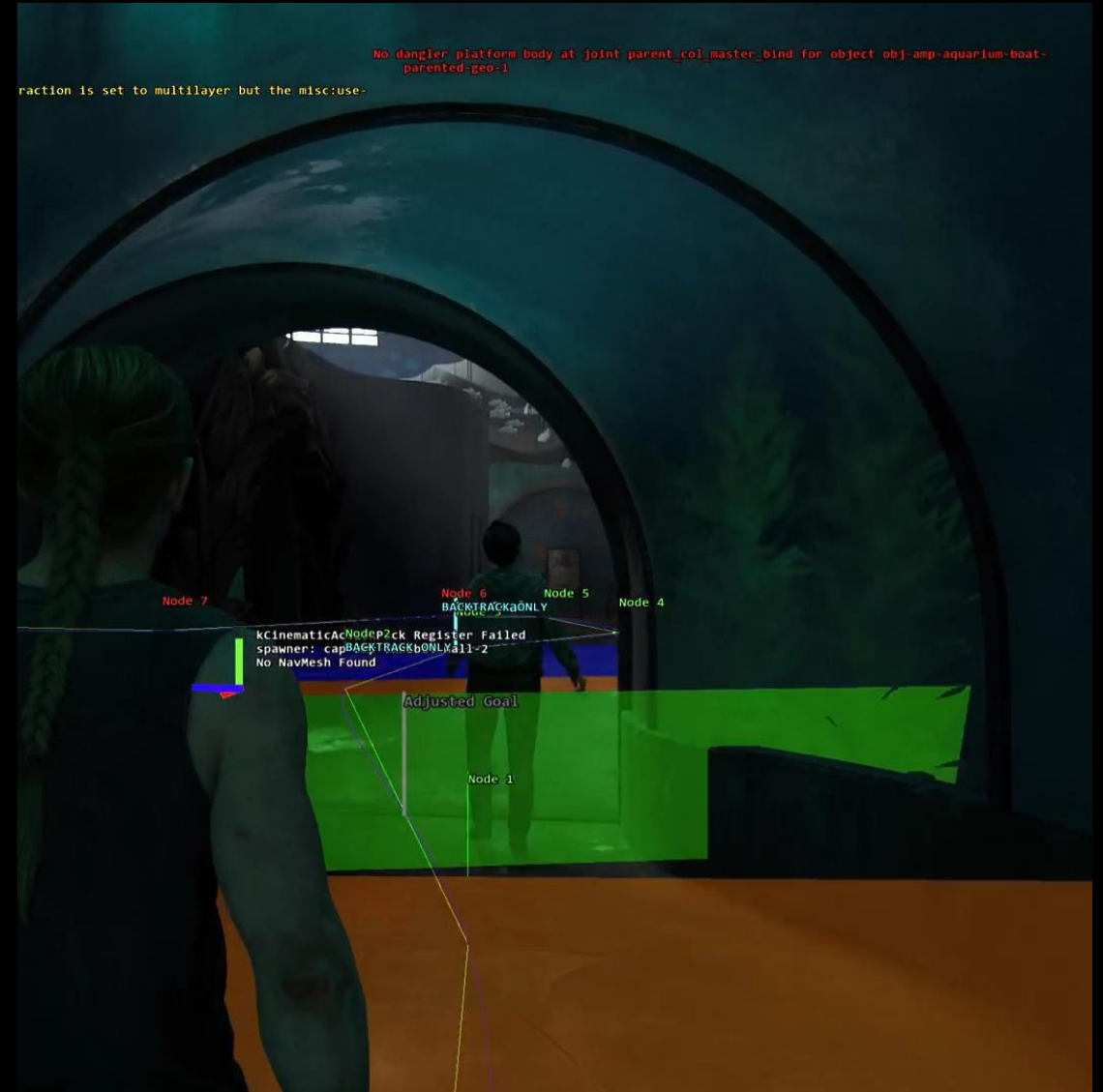
# Searching the Aquarium: Raw Gameplay



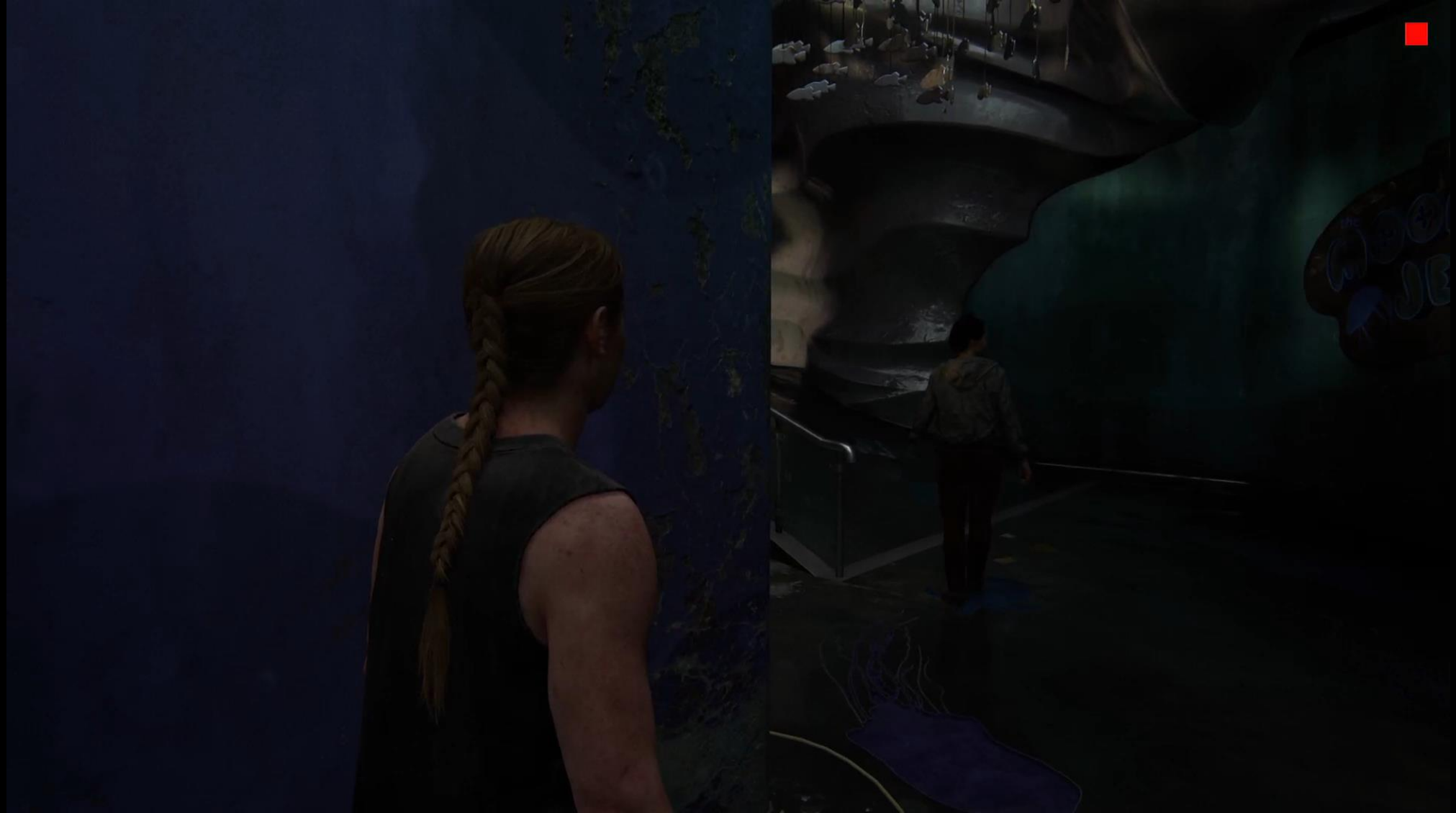


# The Lead System

- **Revamped code** takes advantage of motion matching, handles hairpin turns, and tracks factors like line-of-sight to Player.
- **Simplified Designer tuning:**
  - Ideal lead distance
  - Min and max acceptable “zone”
  - Backtrack threshold
- Designers focus more on **tuning behaviors that convey character & tone** (e.g. urgent vs relaxed):
  - How soon/how often Allies turn around to “check in” on player after stopping to wait
  - How fast Allies move when leading player, and how long they take to speed up or slow down



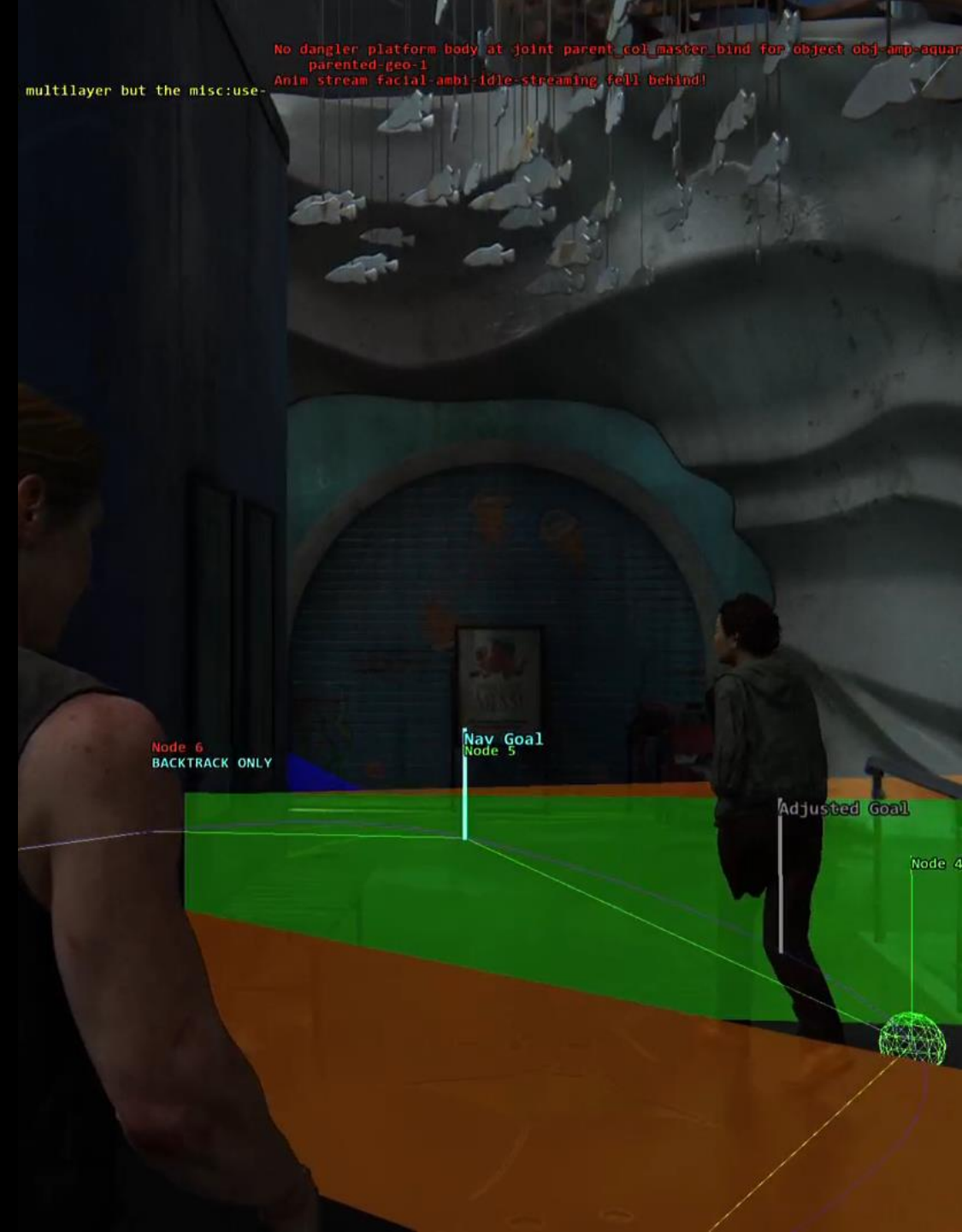
# Lead Backtracking





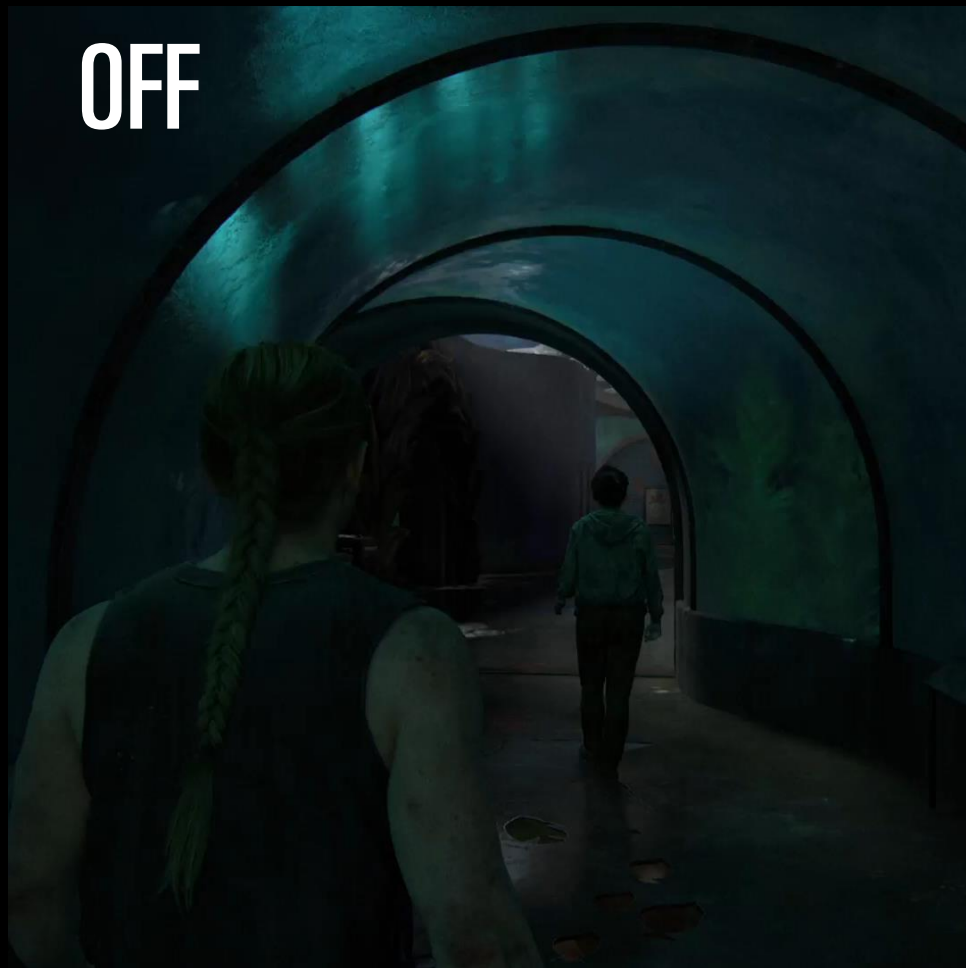
# Move Performances

- Special mocapped animations performed *while in motion*, like turning sideways or even backwards to look at something while walking and speaking.
- Move performances are triggered in-game when Allies move past “*points of interest*” placed at key positions in the world.
- **Breakthrough:** We realized we could “hack” Allies to turn to the Player while in motion by placing a dynamic POI *above the Player’s head*.

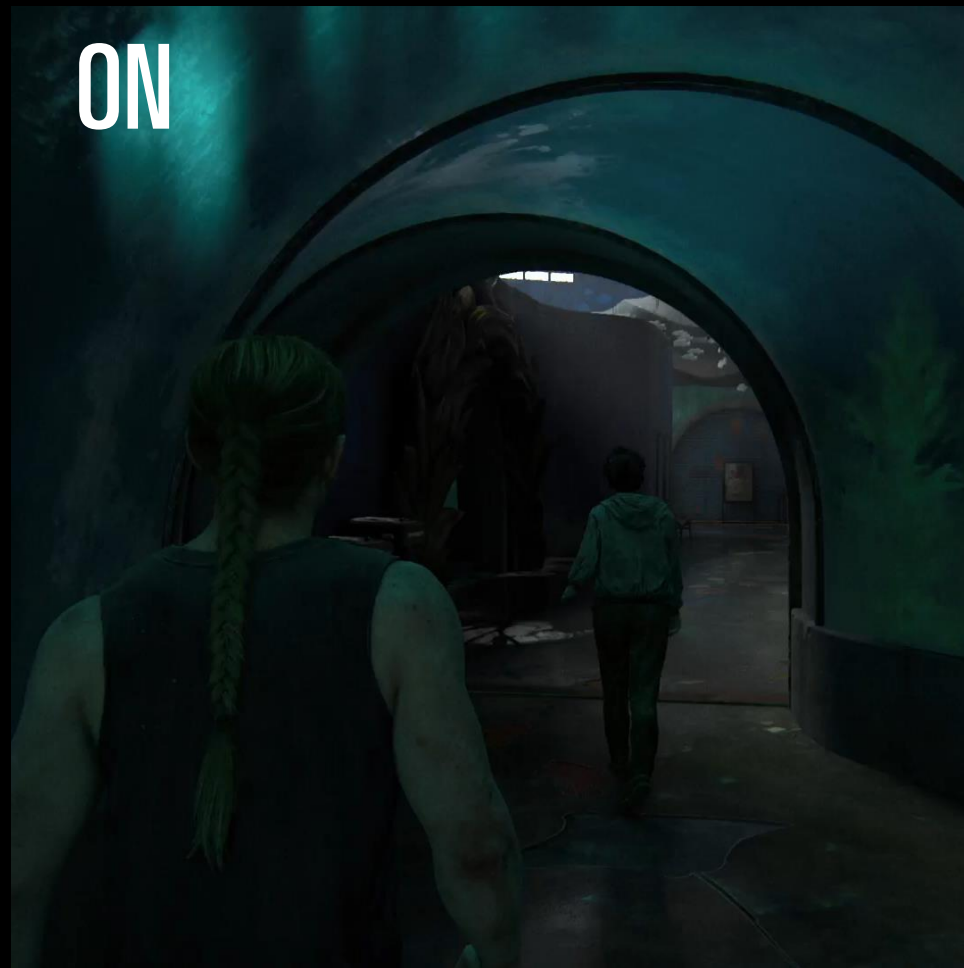


# Move Performances side-by-side

OFF



ON

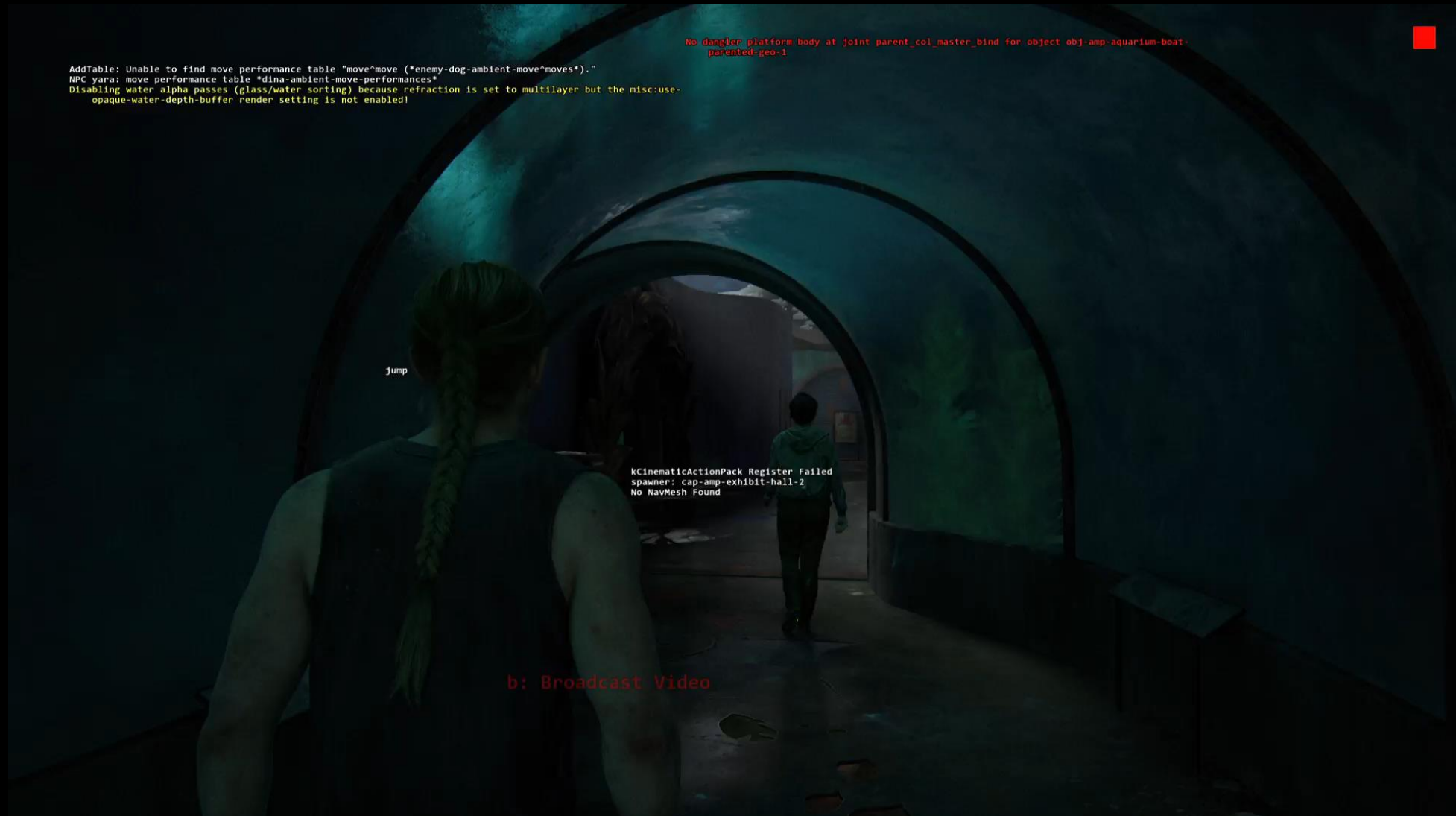




# Move Performances debug



# Move Performances enabled, with debug:







# Thank You To

Vinit Agarwal

John Bellomy

Richard Cambier

Sylvia Chambers

Morgan Earl

Asher Einhorn

Jason Eldred

Travis McIntosh

Kareem Omar

Almudena Soria

Alex Stewart

Laura Swartz

Karina Villanueva