

The VRDC logo features the letters "VRDC" in a bold, white, sans-serif font. The letters are set against a dark blue background that is shaped like a downward-pointing triangle. This triangle is centered at the top of the slide and overlaps with the red background of the slide itself.

VRDC

Integrating Live Actors into Non-Location Based Immersive Theater VR Experiences

Samantha | Julian | Tara | Tanya
Tender Claws & Piehole

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Samantha: Tender Claws as a studio combines a range of disciplines to work across a variety of media. Our two most recent projects are AR Tendar and VR Virtual Reality... But we've also worked across, mobile apps, installation, visual art . . .

We're going back to our early interest in live performance to collaborate with Piehole and think more about the intersection of immersive digital worlds and theater.

“All true alchemists know that the alchemical symbol is a mirage as the theater is a mirage. And this perpetual allusion to the materials. and the principle of the theater found in almost all alchemical books should be understood as the expression of an identity (of which alchemists are extremely aware) existing between the world in which the characters, objects, images, and in a general way all that constitutes **the virtual reality** of the theater develops, and the purely fictitious and illusory world in which the symbols of alchemy are evolved.

— Antonin Artaud, The Theatre and Its Double



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In the XR community, There's a lot of legitimate and well-founded buzz about the parallels, crossovers and intersections between theater/live performance and immersive digital media.

Often, the idea of including live actors is considered promising, but dismissed off-hand as impractical for production or scale reasons. But it is such a fruitful and interesting territory, that it is worth pushing on the constraints and finding unique ways and opportunities to give at home users access to live performers.

Design Questions

- Interweaving Live and non-Live Content.
- Dialog as Actor Improv tools. Script as puppetry
- How to create an interface and infrastructure that supports the magic
- Designing types of live encounters in VR context, and make it feel live
- Ways of logistically coordinating in uncharted territory



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As artists who have a history of working with theater and VR AND who have spent the last year in the trenches working on a non-location based, at-home experience with live performers. We wanted to give this talk to spark further discussion about how performers could be integrated outside LBE. Here are some things we're trying as a jumping off point for bringing live actors into at-home XR experiences.



Overview



Scripting

Samantha Gorman



Interfaces & Infrastructure

Julian Ceipek



Performance

Tara Ahmadinejad



Production

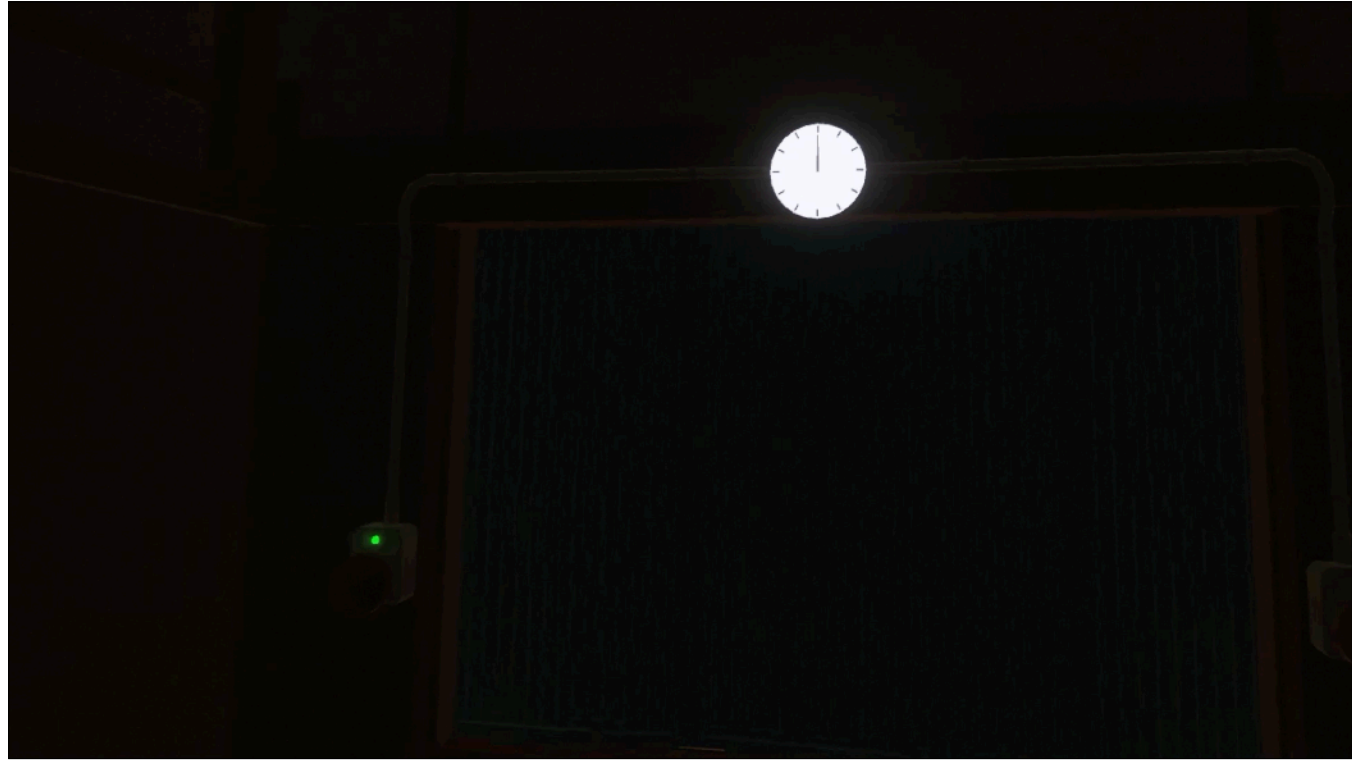
Tanya Leal Soto



Takeaways



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[Trailer: <https://www.youtube.com/watch?v=BEtJM0VeuAM>]



Two intersecting worlds. The game begins in the Under. The Under is a type of vaudeville stage that exists in a special dimension outside time and space.

It's inhabited by quirky lost voyages and souls that wandered off course and became lost in time. They all gather at the Under to perform for you. Your guide is the mysterious proprietor of the Under: The MC.

The main ACT of the Under is the story within the story. The MC's newest act: The Story of the Aikman.

The ill-fated last month of a small oceanic research vessel. Players witness a survival narrative unfold between characters, while discovering that they may, or may not, have the power to influence the crew's fate and how time operates aboard the ship.

Live Actor Roles



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External Character Development: Voice, Story, Movement
Live-Interactive Cabaret Shows for intimate audiences
One-on-One Encounters
Inhabiting and Possessing NPCs

Live Actor Roles



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Overview Scripting Interfaces & Infrastructure Performance Production Takeaways

Scripting



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Writing simultaneously has to be structured, scripted but also modular and variable so it can be responsive and live.



Inspirations for the project and narrative were derived from different forms of media that influenced us

1. Book: Invention of Morel

a Time Loop featuring echos of the past, ambiguous to reader if characters are living or a recording.

BUT! The narrator's belief in their liveness, transforms the narrator from spectator into participant. Ambiguity to heighten mystery and exploration of the island.

Sleep no More: most well known immersive theater

Also operates on loop. If a guest is persistent with a character, they may be rewarded by the character breaking their loop to engage the guest in an intimate one-on-one encounter. The act of singling out, creates a heightened moment where the player is "seen". This process of being seen enhances the feeling of liveness.

(Non LBE)

Our first experience with Journey, was also formative: that moment when we recognized what we at first thought was an AI guide, was actually another living person, recognizable through their movement and intent.

The meditative collaboration between silent strangers inspired our own decision to eliminate certain avenues of multi-player communication to encourage emergent forms of play and new ways to communicate.

The Uncanny

- How does one design responsive dialog and interaction for the gray space of the “Uncanny”: the pivot point between something being living or “dead”
- In our brief moment of indecision our awareness of the other is heightened. How may this producer intimacy between characters/players?



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All of these references have in common the pivot point where non-liveness and liveness comes into contact and generates a space where we have extra-ordinary awareness of the other. It is an uncanny space.

I realize the Uncanny has connotations of “The Uncanny Valley” which shares some features of what I’m trying to get at but instead of eliciting cold, eerie feelings in relation to seeing something too close to human. . .

I’m choosing to use The Uncanny as a term to describe the space of discomfort and wonder that derives from confronting the ontology of another as being simultaneously human and not human... and the power that mystery has to hold our attention...

Benefits of the Uncanny

- Potential to place player in an open and questioning state where awareness of character is heightened.
- Character could use this attention to direct to specific story beats or direct to specific elements of game or world.
- Uncanny could flow by association to “recorded” performances to also inflect them with a “specialness.”



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The main impact of the uncanny is a way to focus on or draw attention to key story moments, but also adds magic and anticipation to pre-recorded content that is much less resource intensive, because there's a sense anything could happen at any time. Which could more or less be true in certain cases of the Under



An uncanny phenomenon is the living mannequin: which is used to generate attention for the set/store and direct attention to specific objects

Focus: The One-on-Ones

At key junctures in some of our NPC stories, the player may encounter their possession by a live actor. This brings up an important design question:

How do we maximize our actor resources to allow multiple actors to play these roles, while maintaining character's Voice and allowing the encounter to feel responsive and intimate?



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ways to work around technical, design and narrative constraints and resources to keep character consistency and maintain character voice, without needing the same actor on staff 24/7 and working

Sound Boards



VRDC

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We're developing interface for actors, that once they inhabit an NPC let's them trigger dialog samples from the VO actors.

Scripting Uncanny Encounters

- Narrative backbone, segmented, interruptible
- Key Narrative Anchors
- Structured around a simple call to action or activity
- Players are Invited to Fill in the Blanks
- Responsive to a range of Player Actions
- Weave Live content within Pre-recorded

= Modular Content



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Narrative Backbone=guiding principle/topic-interruptible segments, digestible, able to break at natural speaking points
includes just enough key narrative anchors to ground encounter

Focused activity that matches narrative tone of segment, but also works with design, interface mechanic for triggering dialog

Players are Invited to Fill in the Blanks= Actors may decide the density of how much dialog they want to and literally as in the player dictates what type of response/activities.

Responsive to a range of Player Actions

Weave Live content within Pre-recorded= lean into the live unexpected arrival or act to get the excitement millage for recorded content. You never know what could happen.

= Modular Content

Script as a Prop Box for Actor Improv

BACKSTORY SEQUENCE (ordered)

- God, Mar, I'm so sick of this place. It's like no one's even paying attention to how crappy everything is.
- I can't wait to get out of here.
- Like honestly I feel like everyone's babysitter.
- I just don't know how to help everyone help themselves.
- It's like they've all just inhaled so much sawdust and stain fumes all they're brains are fried. Not you.
- Like I love everybody. Well, obviously I don't mean everyone. You and I are different, you know?
- Funny that those of us that need to get the hell out are the ones that could do the most good if we stuck around.
- I'm honestly tired of people being like "Sara, you're so smart, you know best." Like, you could too if you just applied yourself more!
- Everyone's so polite they never want to make a fuss.
- Like if people looked out for themselves in the first place then maybe accidents wouldn't happen...
- People keep shouting at me for being a bitch, but I'm just trying to stop bad shit from happening.
- Shit happens then everybody just shrugs. And it's like don't shrug, it's a tragedy!
- I'm so mad at everybody.
- I'm not mad at you.

NEGATIVE RESPONSE TO A BAD THROW (IF ROCK DOESN'T SKIP)


- Haha what are you doing?
- sucks
- Huh, just . . . wow.
- Ouch, try harder
- Oh my god what are you aiming for?
- . . .

POSITIVE RESPONSE TO A BAD THROW (IF ROCK DOESN'T SKIP)

- Ah so close!
- Ooh almost Mar.
- Keep trying
- It's ok, I can always give you tips
- . . .

POSITIVE RESPONSE TO A GOOD THROW (IF ROCK SKIPS)

- Pretty
- Wow that one was great!
- Ooh look!
- ...



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Text as an actors prop box for improv

LEFT (PLAYS ON SEQUENCE)

Narrative Backbone=interruptible segments, digestible, able to break at natural speaking points. Key information and tone communicated

CHALLENGE

Imagining they can hold together/stand on their own if separated by time. Recording for natural pauses in delivery

RIGHT (PLAYS in BIN)

Structured on Call to Action or Activity: skipping stones

helps give the player something small to do to listen through text and ground tone/relationship with other character. Short phrases can be more satisfying. Actor has power to decide when how to trigger the category.

-helpful if it is uniform so actor has as sense of what they could be getting from trigger. (like not mixing statements with questions)

Script as a Prop Box for Actor Improv

WATCH HOW IT'S DONE

- Alright lemme show you how it's done.
- Watch me as I do one.
- See you want to get low like this.
- I'll do one watch how I do it.
- Alright here we go
- . . .

Tips

- You've got to hold it between your thumb and middle finger
- Stay low to the surface
- Face the water at an angle
- You need to flick your wrist

CALMER OBSERVATIONS

- It does smell so good here, I'll miss that.
- This is nice.
- Thanks for listening to me, Mar
- I love you, Mar.
- I'm so bored.
- I don't know if I'll miss it here.
- Ca-caw! [like, a bird sound... what kinds of birds are around? That sound.]
- [whistle something]

EXIT TEXT

- Thanks for listening Mar. You know, you're the thing I'll miss most about his whole place. I can't keep taking care of everybody. I just... I need to get out of here.

PLAYER WANDERS AWAY


- Hello? Mar?
- Where are you going?
- Excuse me? Earth to Mar
- What the hell, Mar? Just trying to have a heart to heart.
- C'm back, I didn't mean to be such a downer.
- Hey Mar come on, don't just leave.

PLAYER THROWS STUFF

- Come on Mar, stop throwing stuff.
- Are you kidding me?
- Wow, so considerate, thank you so much.
- Jesus Mar, what the hell?
- Oh my god stop.

REACTION TO BEING HANDED A ROCK

- Oh, thanks.
- No that's okay Mar you do this one.
- Wow, for me? You're SO kind
- Haha I can get my own rock Mar
- You're such a good friend



• See that's what I'm talking about. We need to look out for each other.

CALMER OBSERVATIONS

- It does smell so good here, I'll miss that.

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LEFT

very realistic stone through simulation. Player needs coaching

categories of the script that encourage movement, physical interaction with player and exchange. Exchange of information helps reinforce intimacy, quality/ limitations of movement help reinforce liveness.

RIGHT

reflecting on possibility space of player, realistic impulses how can actor call them back or give satisfaction of 1 to 1 responses.

Ways to make natural and combat repetition

Number entries

Think about it/test in context of sentence

Work with complete thoughts

Actors know number of entries

Careful of varying phrase length

Overview Scripting Interfaces & Infrastructure Performance Production Takeaways

Interfaces & Infrastructure



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Objectives

- **Intimate Moments between Players and Actors**
- **Optimize # meaningful interactions**



When integrating live performers into an immersive VR experience, you have to decide what you're optimizing for. For The Under Presents,

- we want to create intimate moments between players and actors
- and we want to maximize the number of meaningful interactions where a player feels special

Objectives

- **Intimate Moments between Players and Actors**
- **Optimize # meaningful interactions**



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We think having a single shared space with hundreds of players wouldn't facilitate that,

Objectives

- Intimate Moments between Players and Actors
- Optimize # meaningful interactions



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So we instead create many smaller shared spaces

Objectives

- Intimate Moments between Players and Actors
- Optimize # meaningful interactions



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with 10-20 players each.

Objectives

- **Joining Spaces?**
- **Multiplayer Interactions?**
- **Tools for Magical Moments?**



Which leads us to these questions:

- How do players and live performers join shared spaces, and which of the spaces do they join?
- How do multiplayer interactions work within these spaces?
- And what tools do the live performers have to facilitate unique, magical moments for the players?

I'm Julian, and as a systems developer at Tender Claws, one of my roles has been to implement good solutions to these questions.

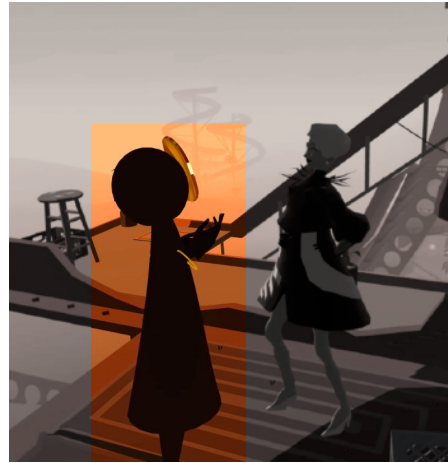
Joining Spaces



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First: how do players and live performers join shared, networked spaces?

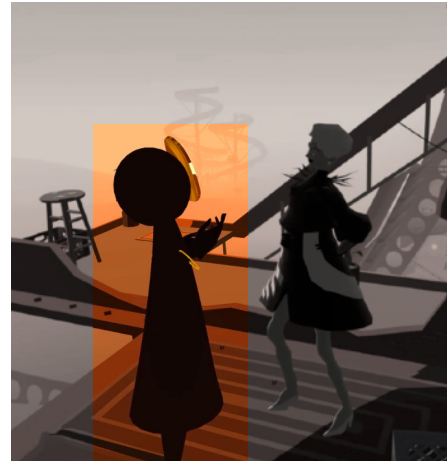
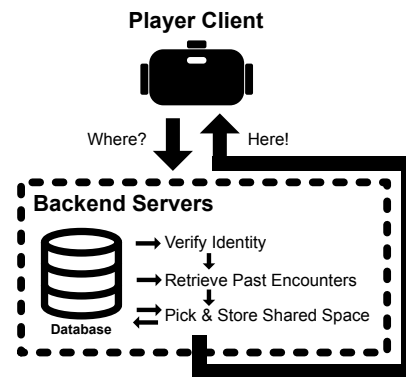
Joining Spaces - Players



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For players, the answer is simple, because we want to give them a seamless experience. Similar to Journey, they don't have to think about it. When they enter a part of the virtual space that supports a shared experience, they automatically enter a networked space.

Joining Spaces - Players



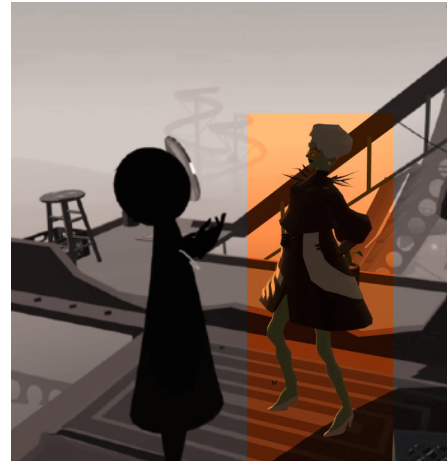
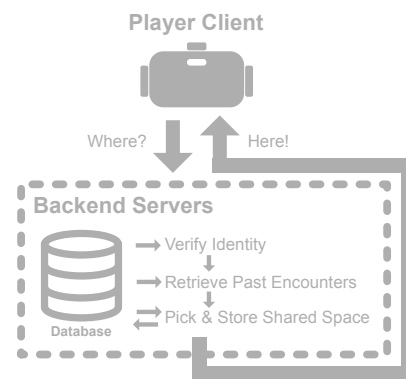
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Behind the scenes, their device sends a secure request to our backend servers asking “which space should I join?”

Our servers

- verify the player’s identity
- retrieve information about the types of actor encounters they’ve had in the past
- use that information to pick and store which shared space they should join,
- and send a response back to the client with enough information to join that space

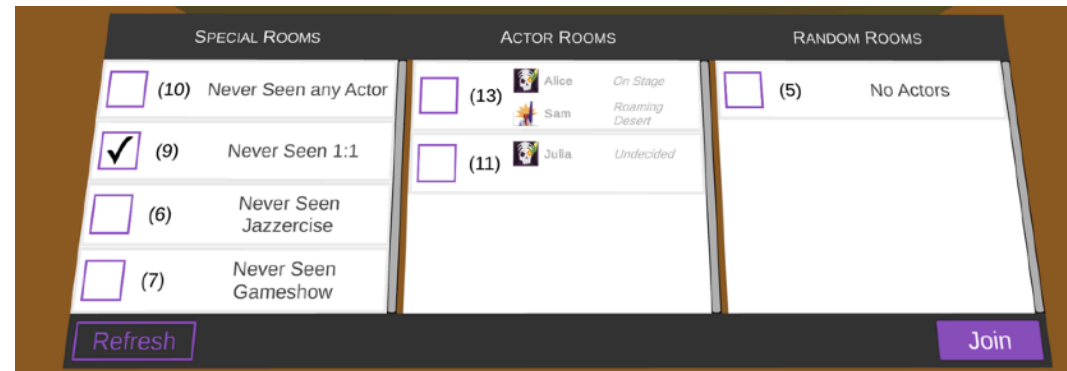
Joining Spaces - Actors



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For actors, the story is a bit more complicated, because we want to give them agency in deciding where they could have the most impact

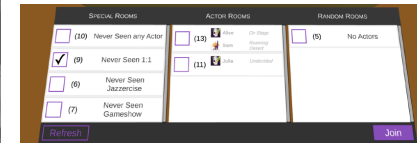
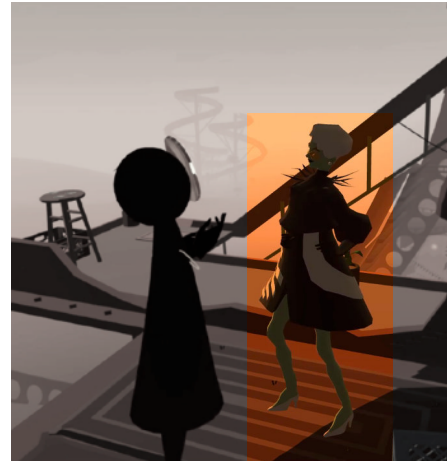
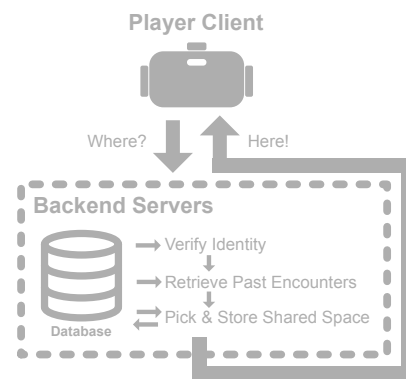
Joining Spaces - Actors



But we also don't want to overwhelm them with choices, so we created a simple interface that lets them choose to enter a shared space or "Room" with players who meet certain criteria like never having seen a live actor before, or never having seen a specific type of stage act.

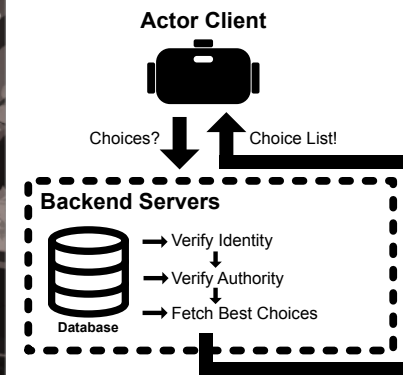
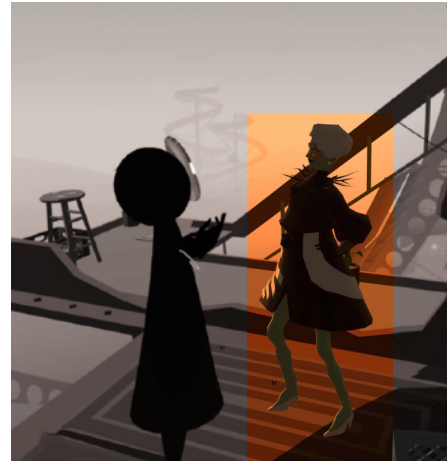
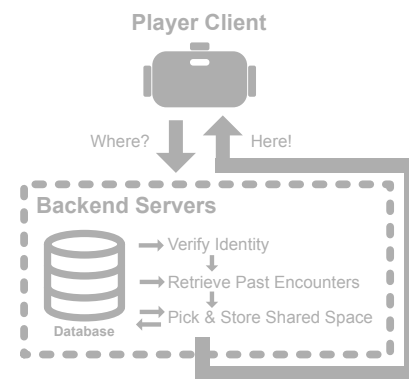
Actors can also jump into a space to help out another actor, or they can enter a random space if they want to try improv-ing for players without knowing much about what they're getting into

Joining Spaces - Actors



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Joining Spaces - Actors



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Behind the scenes, things are actually very similar to the flow for player clients:

The actor's device asks our backend servers "hey, what room choices do I have?"

The servers verify the actor's identity and make sure that they're actually authorized to wield actor powers — we don't want hackers or regular players to have access to all of an actor's special godlike abilities.

Then the servers fetch a curated list of categorized spaces that the client can display for the actors.

Multiplayer Interactions



Once an actor or player has joined a networked space, how do we support interactions within that space?

Multiplayer Interactions



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From an interaction perspective, players have limited but versatile tools for communication, like snapping

Multiplayer Interactions



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And multi-hand grabbing, which facilitates sweet interactions like this one

Multiplayer Interactions

- **Hosted Realtime Networking**
 - Synchronized state
 - Remote Procedure Calls
- **Custom Servers**
 - Matching + Monitoring
 - Persistence



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Behind the scenes we decided to use a hosted realtime networking solution — Photon

Which lets us synchronize a small amount of state per-shared space and per-player (like the positions and rotations of their body parts).

We also use remote procedure calls for short-lived one-off events that don't need to be strictly synchronized when a new player joins an existing networked space. An example is player snapping.

Our custom servers are reserved for higher-level decision making like matching players into shared spaces, and monitoring so that we know when we need more live actors for the amount of players we have. The servers also offer a persistence layer so that we can store information about players' past interactions with live performers and can use that to match them into spaces where we think they'll have the best experience.

Tools for Magical Moments



Finally, what tools does a live performer have to create magical moments that make players feel special?

[illegible]

This is our current iteration — it uses swappable radial menus that actors can use to choose their active special abilities. The key here is that actors don't need to look at their hands to select or use the abilities — the menus appear wherever they are looking. Before jumping into a space, actors can choose which radial menus they will want to switch between, and they can have different setups per hand. This is an expert interface that requires training to use, but the benefit is that it leads to seamless performances interwoven with unexpected, delightful moments.

Tools for Magical Moments



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Actors need to be able to refer back to players based on what the players have done in the past. In some of our early prototypes, our live performers had trouble referring to players because they look very similar and can teleport around.

Tools for Magical Moments



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That's why we added the colorful labels above players' heads that you might have noticed in some of the earlier images. They are only visible to the live performers. This may seem like a small addition, but it made a world of difference. Working with Piehole has been great because they've helped us figure out how to bring immersive performances to VR.

Overview Scripting Interfaces & Infrastructure Performance Production Takeaways

Performance



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Piehole



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Piehole Live Arts Collective, I'm a Theater Director

Started out doing puppetry and what's referred to as "Physical Theater", which is relevant or performing in an animated VR context

Different mediums and formats

Sometimes audience seated, sometimes in installation, as you can see on the right side here.

Whatever the format, we're always looking for ways to foster audience agency



Piehole Members are Visual Artists, Performers, Writers, etc.

Generative Performers, which means they have background in improvisation, as well as writing and developing characters in the context of a larger narrative. This work is also often referred to as "devised theater"

So both "physical theater" and "Devising" background, as well as experience with immersive theater, offer useful skillsets to draw from in the context of VR

Developing Content for Live Encounters

with Performers

- **Providing backstory/“mythology”**
- **What makes something “feel live?”**
- **Identifying key structural points**
- **Developing unique characterizations and riffing off structures**



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Working from Samantha's Under Mythology “bible”

1. Determining what makes something “feel live” and assessing whether it could happen w/out a live actor or not
 2. Understanding the structural keypoints of interactions
 3. Performers working with those structures but creating their own characterizations and riffing off those structures
- (Original Art vs. Recycled Art)



- How these environments are overwhelming, time to adjust for both performers (distracting for the performer, initially, hard to act "well") and guests (a lot to compete with)

Acting Challenges in VR

audience behavior



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- Audience behavior in VR vs. in the live theater (gaming tendencies, potential “trolling,” but really just the ways that people test “liveness” and “limits” less reverent than theater audiences)

Applying Live Performance Techniques to VR

- **Physical Techniques**
- **Vocal Techniques**
- **Handling an audience (and what we can learn from drag, e.g. Taylor Mac)**



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Physical and vocal techniques for commanding control in theater (hesitate and demonstrate, assessing the intimacy of the moment, scaling accordingly)
Handling an audience (what cabaret and drag performance teaches us, Talyor Mac, etc)

Adapting Live Performance Techniques for VR

- **Power Dynamic**
- **Rehearsal**
- **Balancing Guidance and Player Agency**



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Power dynamic: technical interface, ability to speak, other “powers”

Rehearsal (for actors to get used to interface and the spatial dynamic)

Acknowledging players/making them feel seen, while also letting them to roam free, rewarding different approaches to the space.

Playful ways for teaching players how to engage, while allowing for subversion (i.e. The Cage)

Adapting Live Performance Techniques for VR

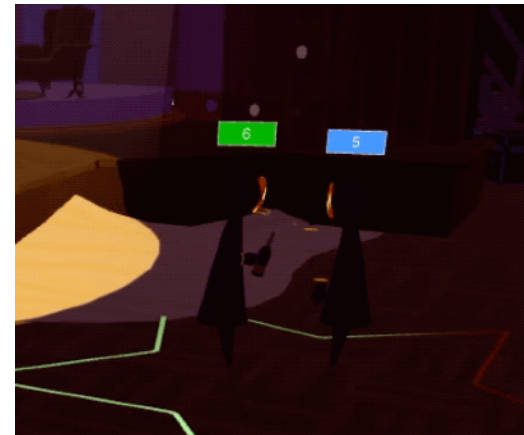


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“Previews”

- **Huggers vs. Throwers**
- **Inciting non-verbal communication**
- **Being open to radically changing course as a last resort**



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Demo at Sundance as play-testing and also “Previews” - in which actors are adapting with each successive “run” as they learn about different types of audience interactions

Huggers Vs. Throwers (examples of different types of audience behaviors, and how audience influence each other)

Adapting structure to audience response, understanding what is/isn’t working, what is/isn’t holding player attention/what makes players want to talk verbally vs. what makes them inspired to communicate through non-verbal gestures and other abilities like snapping and handing off objects.

Overview Scripting Interfaces & Infrastructure Performance Production Takeaways

Production



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Logistically, how does it happen?



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- **Organizing multidisciplinary teams**
- **Developing workflows for acting in virtual spaces**
- **The Human factor**
- **Why not LBE?**



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Organizing multidisciplinary teams

One fun thing we haven't mentioned is that Tender Claws is based in Los Angeles while Piehole is based in New York

So this on itself made us be very careful with coordinated communications but also we had to be careful of translating and agreeing on naming conventions because the teams we are working with are not cut by the same scissors.



Within Tender Claws we all have different backgrounds

Fine Arts

Film

Programming

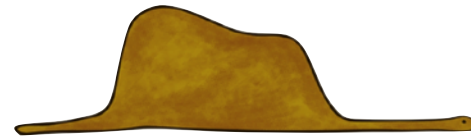
Puppeteering

Theater



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And YES we also wear many hats.



This is not a hat



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The combination of all these disciplines and the collaboration with Piehole, helped everyone broader perspectives.

We were able to get different vantage points on different situations.

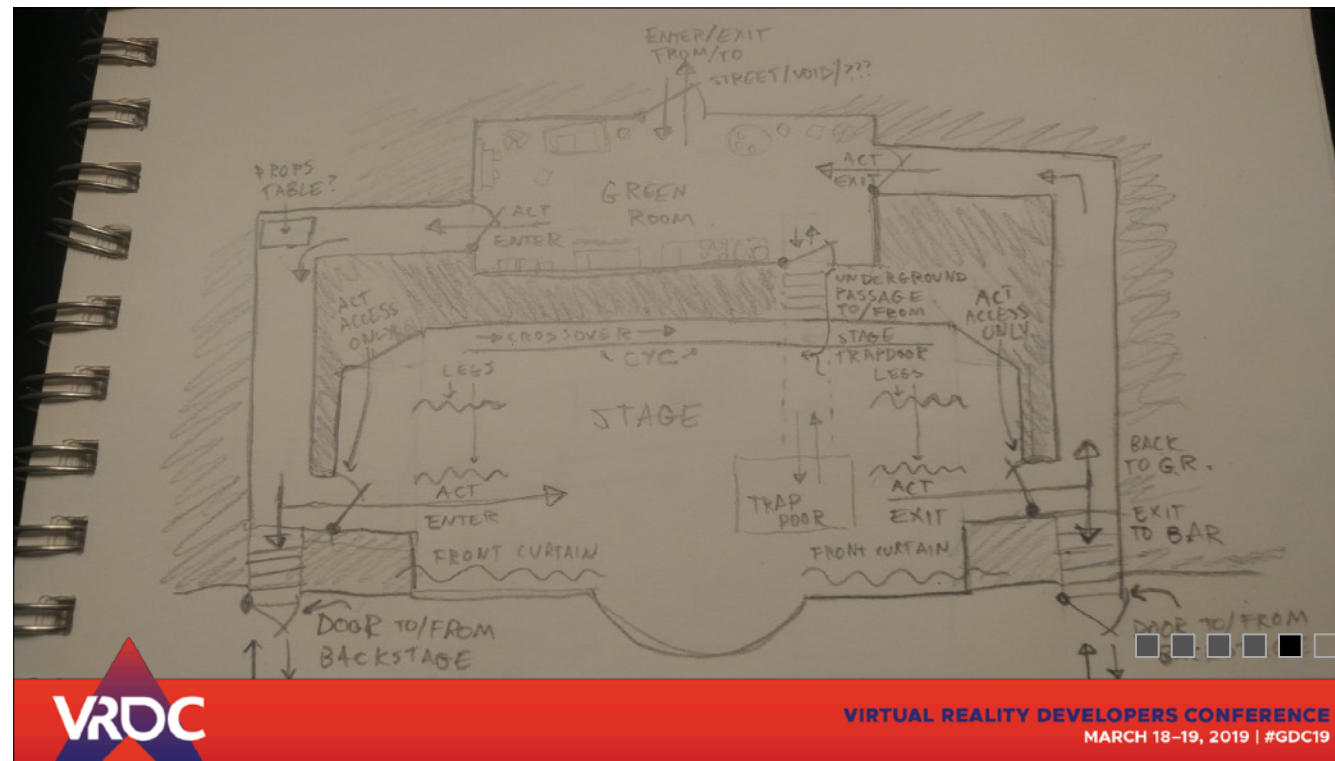
It is highly beneficial to have someone attack the same problem from different angles.

Our first organizational stone, which you've already heard about, was the bible of the project, thanks to that we have been able to allow for different departments to continue to add to the world.

Yet a lot of work has to be put into making sure everyone has the correct information, and is on the same page and more importantly understands where the needs are coming from.



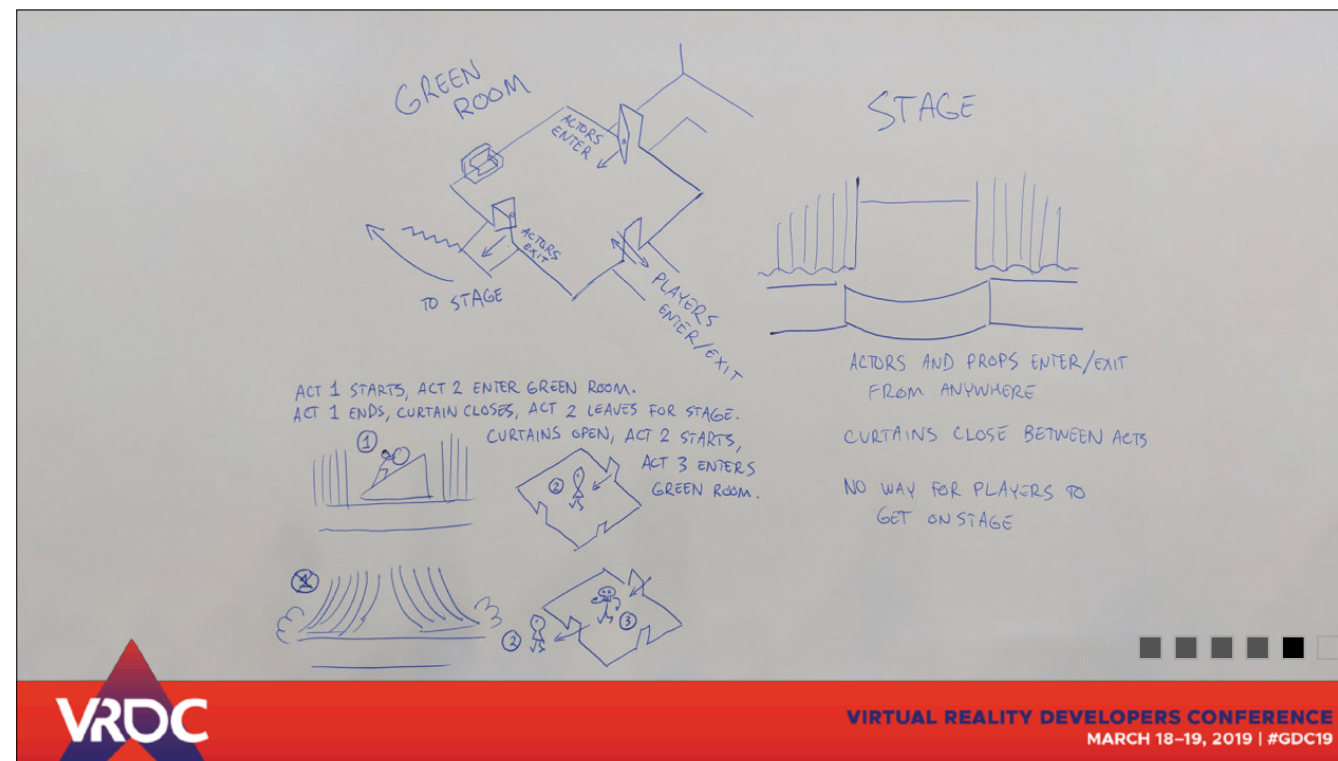
One good example was understanding the layout of the stage and how this would affect the Live actors interactions with the players.
Our Art director looked for a bunch of references of stages.



VRDC

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Then Piehole informed us of the actual lay out of a theatre, and we discuss ideas of the spaces we could use to create moments with the live hosts and moments with the actors doing one on one encounters.



Our creative director worked on the potential interactions.



And eventually we had the Under stage.

The crowdsource information also helped make decisions to allow both the player and the live actors to have some agency.

For example a decision was made to not allow the players on stage unless the live host invites them, this way the live host can control their space and have the ability to use this power to make a player feel special.



Developing workflows for acting in virtual spaces.

This has been an ongoing process and will help us when scaling the project and training actors.

Actors no matter the experience will need special training in VR.

Thankfully, the untethered nature of the headsets we developed in, allowed us to have rehearsals where different people could log in to the Under from different cities.

Rehearsals happened in VR

But because of that we soon had to consider the human factor: settling into the VR space and into the character's physicality is something that varies from person to person.

Embodying character's means puppeteering different size bodies and the movements can only be understood in VR while embodying the characters. It is very physical.

— play gif



Learnings from the preview, actors shifts.

Again this human factor!

One interesting thing we had to consider were actor shifts.

We looked at both SAG (screen actors guild) and Equity's (theatre union) but neither really reflected the work being done here.

While SAG actors can have 12 hour days, it is known they have breaks during set ups.

Equity has 10 minute breaks every hour and 20 minutes.



Even during rehearsals, one of the findings was understanding the physical and mental demand of the actors.

—— play video

Live hosts have to be engaging, loud, attract the attentions of the players, interact with the audience.

Actors doing one on ones, or possessing NPCs have to be in constant state of alert and in character waiting for the opportunity to start a new adventure while in the virtual space.

It takes a minute to adjust to the different passage of time in VR

- 2 hour shift
 - 30 minutes logged in
 - 5 minute break
 - 30 minutes logged in
 - 10 minute break on the hour

★CHANGE ACTORS

- 2 hour shift





Why non LBE?

If you know our work, Tender Claws creates long form narrative projects and we are always looking for ways to encourage exploration and create the desire to come back and find out more about the world and the narrative.

In the under presents we want to create a space where people want to come back to, to be able to scale the experience we will have a loop of prerecorded acts so that when players come into the world there is always something exciting for them to experience, the under runs without the dependency of a live host on stage HOWEVER part of the magic will be to find yourselves interacting with a live host or being swept away into a more intimate moment and not knowing when this will actually happen

Overview Scripting Interfaces & Infrastructure Performance Production Takeaways

Takeaways



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- **Create “modular” scripts, optimize responsiveness**
- **Designing Narrative to Maximize Live-Actor Resources**
- **Build infrastructure to support objectives**
- **Make players feel seen, then set them free**
- **Consider the human factor when training actors to perform in virtual spaces**



Questions?

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