



VFX AS A GAME DESIGN LANGUAGE

By An-Tim Nguyen

Hello everyone! Welcome to my GDC talk: VFX as a game design language.

My name is An-Tim Nguyen and I am currently the VFX lead at Counterplay Games.

I am very fortunate to be here, and I am super excited to go over this topic.

I will be pushing any questions towards the end of the talk, otherwise just grab me afterwards so that we can chat.

I will also be posting my contact info at the end of this presentation for anyone to reach out to me virtually.



Let's start off with some of my background.

I have been making games for about 10 years, from indie to AAA as a 3D generalist, from 3d modeling to VFX. My career started in enterprise VR (pre-Oculus) for large clients such as Boeing, Exxonmobil, Fuji Medical, Saudi Aramco, and so on. Prior to that I used to build mods for games like Unreal Tournament 3 and Fallout 3.

I got into games professionally by working on smaller titles such as Primal Carnage and Recoil, where I had to wear many different hats.

On Halo 5, I carried a ton of integration work for a large variety of outsourced assets, including prototype meshes and functionality for sandbox/interactable props and destructibles.

For Destiny 2 however, I brought over those skills for mission/activity prototyping for open-world public event content, where I directly contextualized and iterated that knowledge into the game's ritual loop.

Later I specialized in VFX, thanks to which I was able to build a lot of seasonal content for years to come as part of its live service model.

But that foundational understanding of how art assets communicate through game design became the most crucial part of the job. Indeed, that is the core of the craft of game VFX and it is fundamentally what separates it from other media (such as film or motion graphics.)

Now I work at Counterplay Games as a VFX lead, where I am applying all of my knowledge on the subject to multiple unannounced game projects.



This talk is intended for pretty much for anyone who wants to understand VFX in games better, no technical knowledge required.

This includes game designers who want to collaborate better with VFX artists to get the most value out of their content.

This is also for aspiring game dev students who want to understand what criteria is generally considered to be successful for VFX.

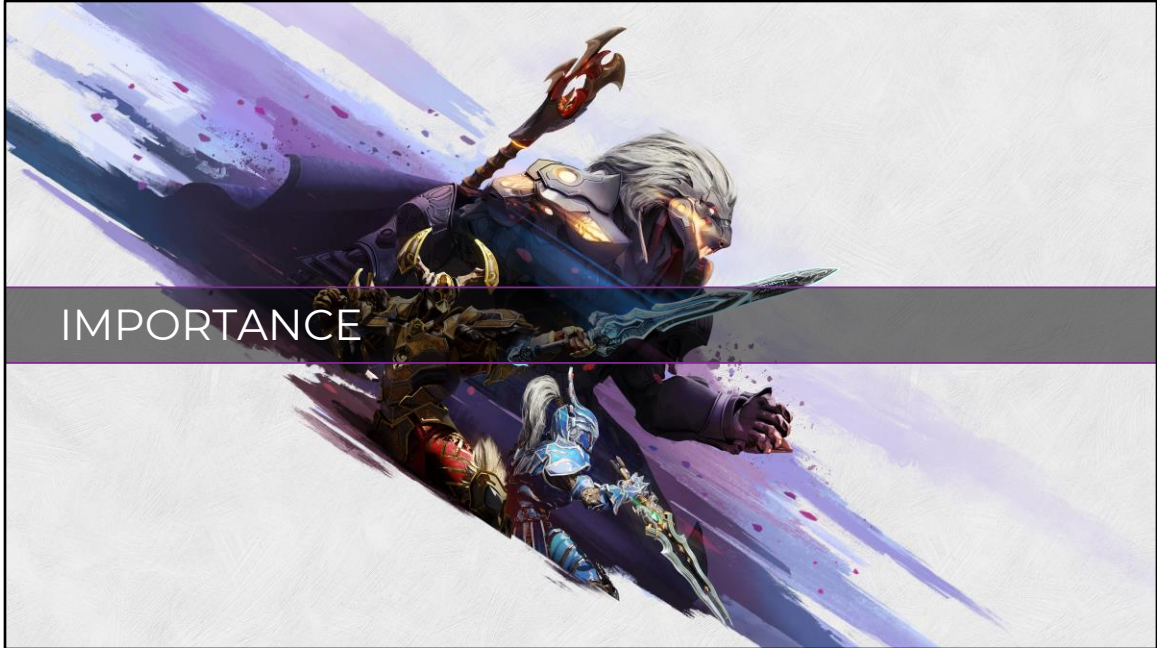
Finally, this is for any other VFX artist who wants to be able to explain what they do for a living to people outside of their specialty.



As I had just mentioned earlier, this is not a technical talk. It is a generalized overview of what the role, practice and culture of VFX is within a game development space.

To that extent, it is not an onboarding document, nor a step-by-step instruction set on the craft. It is a celebration of commonalities with other disciplines.

We are not describing the polish; we are describing the glue.



Even though this talk is not designed to be a deep dive into any particular rabbit hole, it brings to light multiple important points.

The consumer value perception of VFX is immediately tangible. It can literally drive product and business goals because it is communicative of game design.

As such, it is capable of sharing success with those outside of the VFX discipline, by providing a deeper opportunity for impact: by aligning it correctly with all of the other moving parts in development, you can tap into a player's experiential Gestalt where the product becomes greater than the sum of its parts.

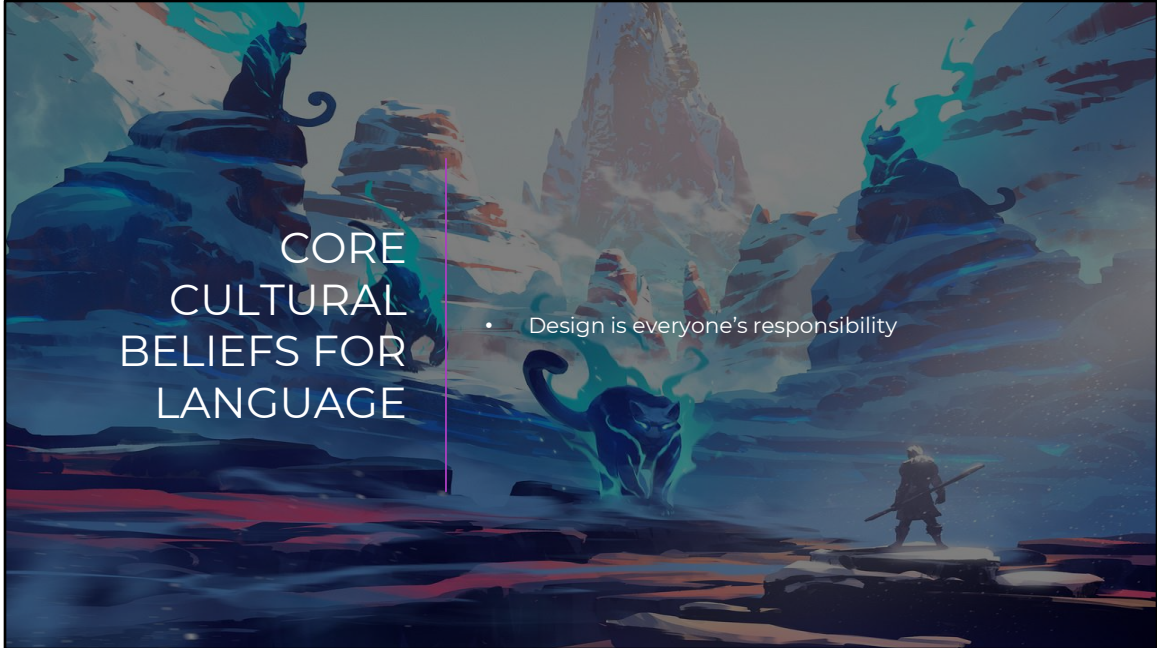


We will start off with stating core cultural beliefs before breaking things down because all language is inherently cultural.

Please take this section with a grain of salt because at the end of the day, every team has their own guiding principles (which in turn informs them on the development of their own language within this space.)

This is again an overview of my current understanding of the field based on my own experiences, that will likely evolve over time as necessity arises.

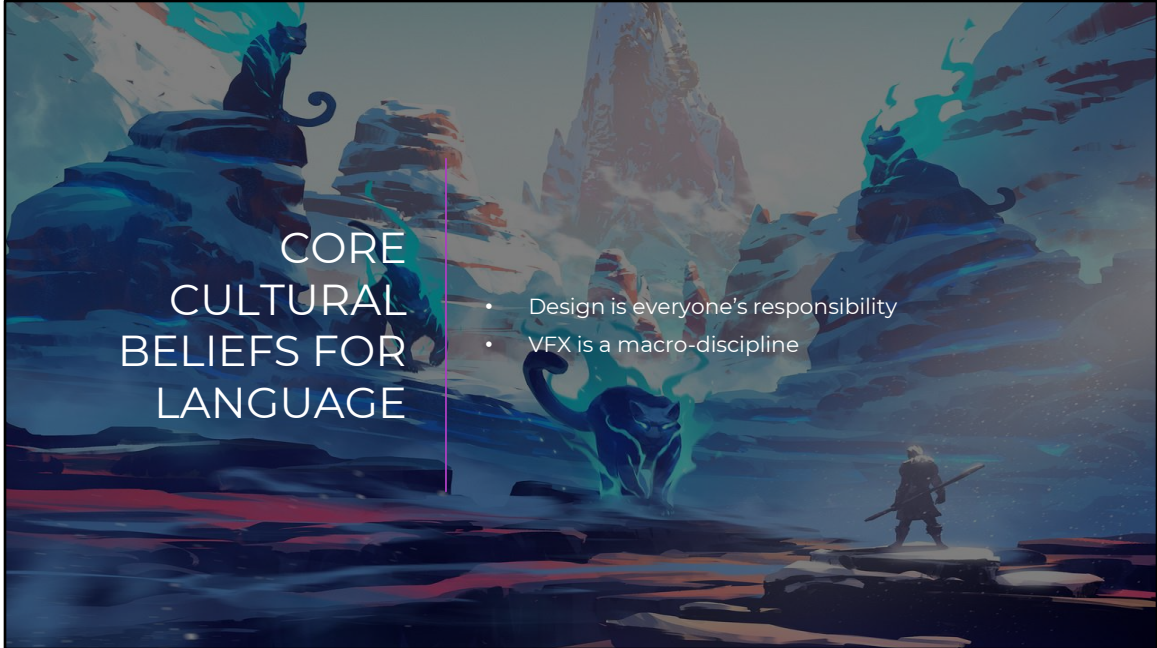
I consider these to be soft or subjective prerequisites to develop a certain fluency.



I believe that design is everyone's responsibility on a game project because of how monumental of a task it is. This is a foundational point, because without it, everything falls apart for game VFX.

You may not necessarily be the design owner for a specific feature or area, but even as a VFX artist, you are responsible for making the game feel good. It is not enough to just make it look appealing; it must be understandable.

This is obviously much more difficult from a production scaling standpoint, particularly with the prevalence of outsourcing operations. But it should be someone's responsibility to figure it out by asking the right questions and by iterating on it, whether it be a lead or the artists themselves on a strike team.



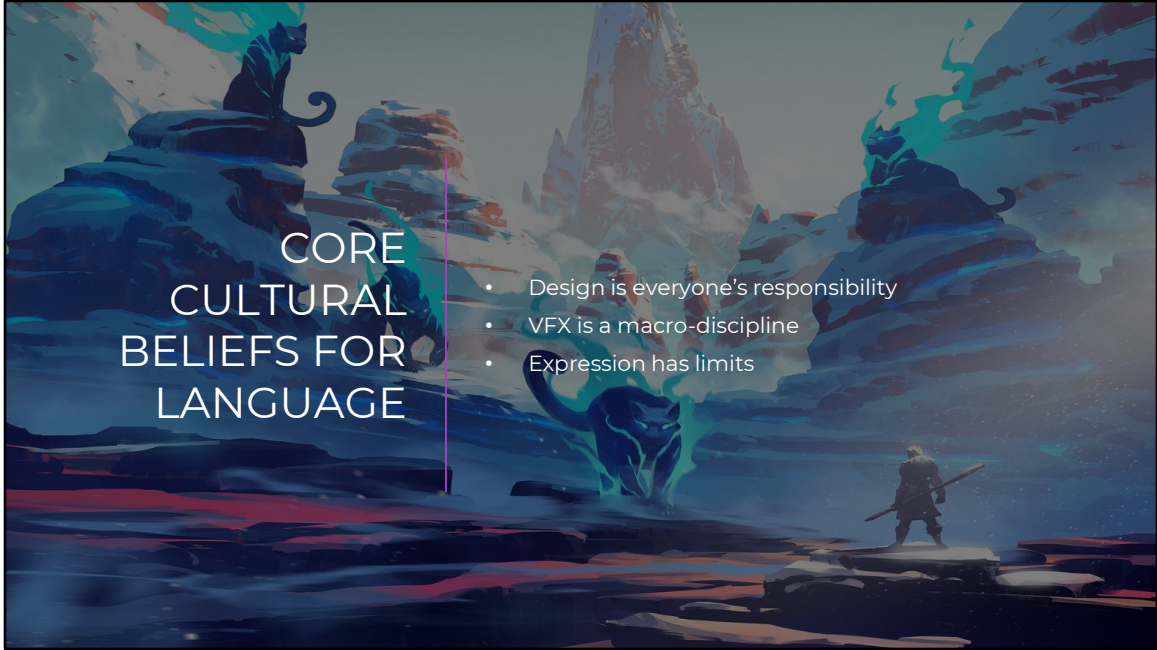
CORE CULTURAL BELIEFS FOR LANGUAGE

- Design is everyone's responsibility
- VFX is a macro-discipline

I also believe that VFX is a macro-discipline, and it is the reason why as a language, it is capable of nuance. It is not restricted to any singular channel of communication.

Historically speaking, VFX teams are comprised of people from many different disciplinary backgrounds, because VFX becomes the middle-ground for all of them. It is from this variety that you end up building for different needs of expression and grammar.

It is not just an art discipline, and it is also why it is so poorly understood by others.



CORE CULTURAL BELIEFS FOR LANGUAGE

- Design is everyone's responsibility
- VFX is a macro-discipline
- Expression has limits

Any VFX solution however cannot solve for every single use case, despite how many areas it touches. There are inherent gaps to language.

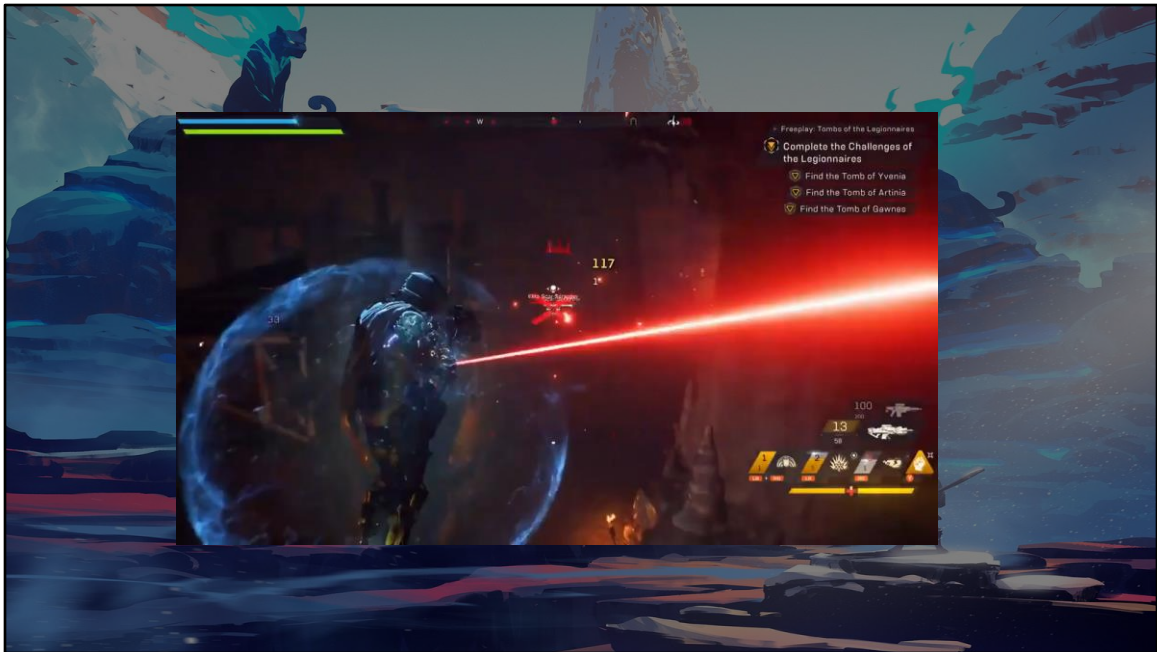
There will always be limits because you cannot build interesting and complex structures purely out of glue. The binding interface cannot be the medium itself.



For example, some game genres (mostly role-playing games) need to communicate specific amounts of damage to indicate weapon/gear effectiveness. Numbers and UI can be the best solution in those cases, because most people will never notice incremental changes between VFX assets.

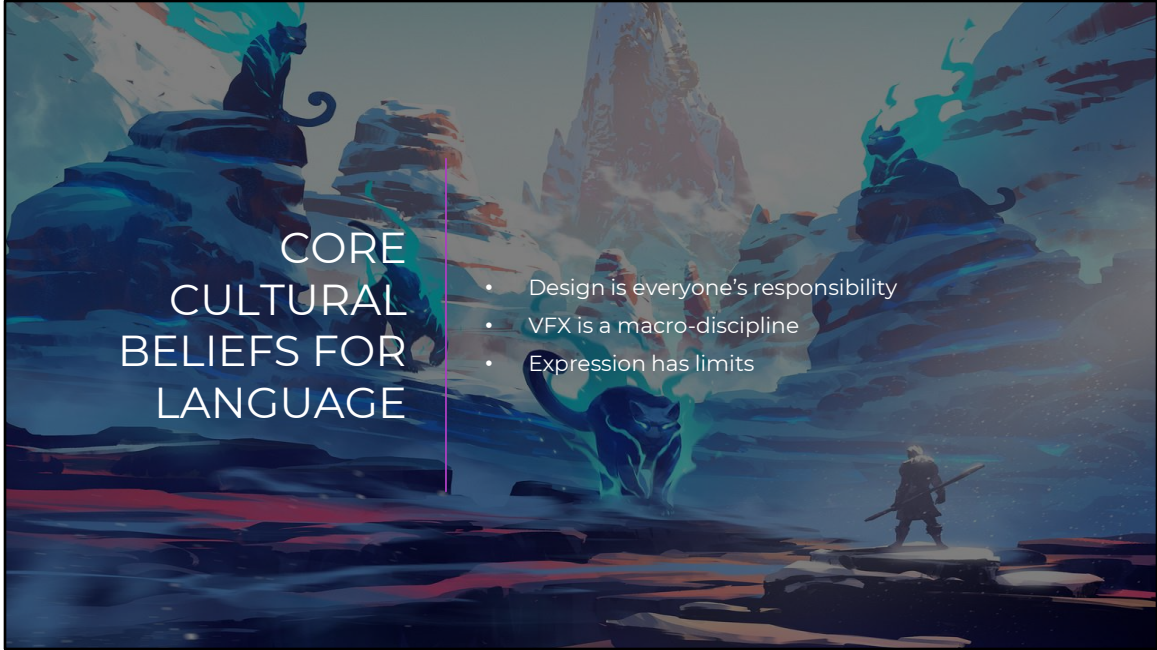
Here we have an example of Diablo 3 gameplay where the necromancer is attacking different enemies. A lot of the gameplay communication is spatial, but in terms of how incremental damage is based on character progression and loot, it is a lot harder to represent in the VFX content itself in tiny amounts.

The reliance on explicit damage numbers is showcased prominently because of it.



Another example of limitation would be how multiplayer games must account for VFX differently than in single player ones, because other players will be receiving gameplay input from other players. A giant blinding spell may feel powerful to cast onto others but feel frustratingly poor to be caught in it.

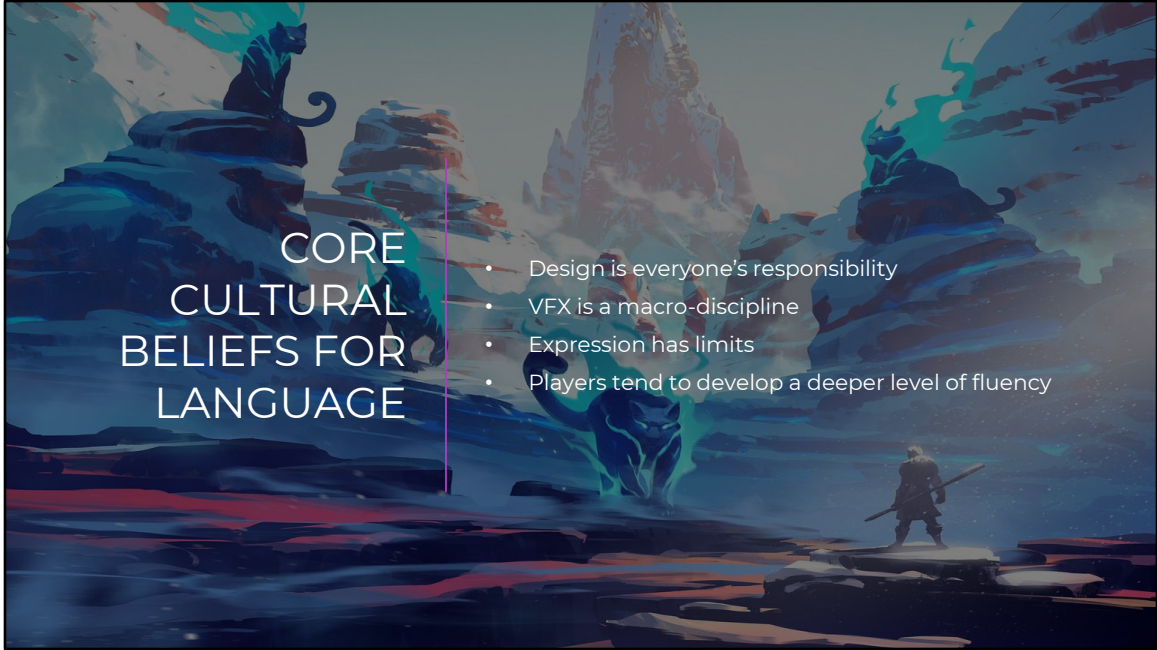
Anthem is a great example of VFX content designed for PvE. Explosions can be much larger, brighter and more opaque than for a PvP-designed title, without a blanket risk of disorientation and player confusion; it is still possible if other players get caught inside of it, but it isn't as crucial as identifying immediate threats.



CORE CULTURAL BELIEFS FOR LANGUAGE

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- Expression has limits

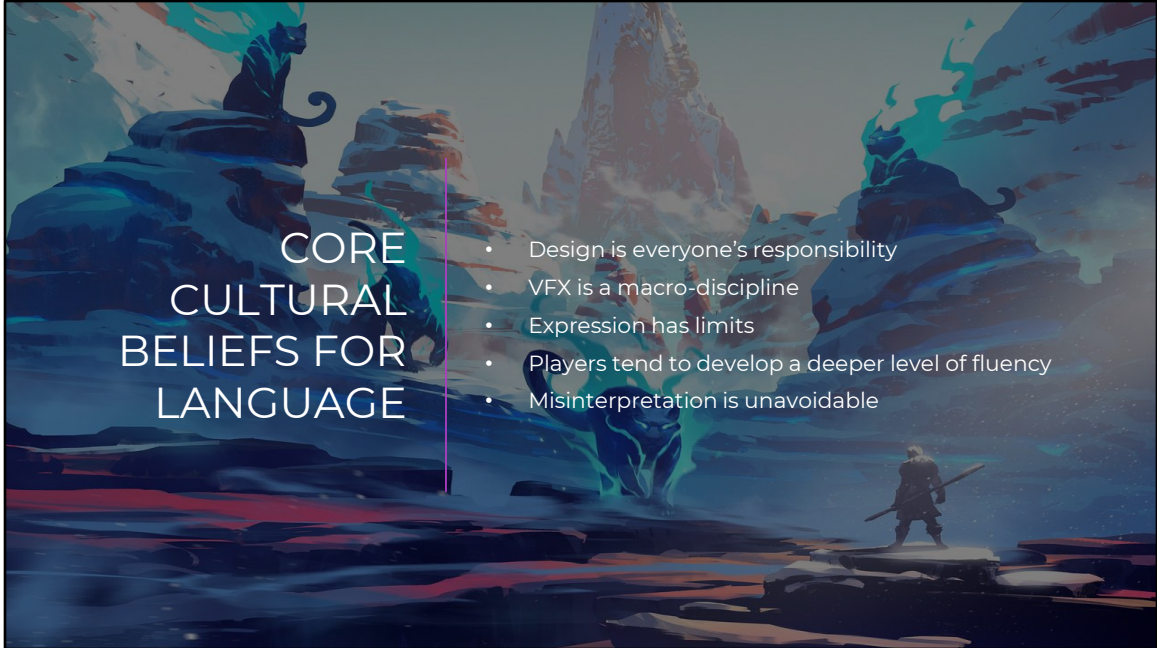
You cannot express everything with VFX, otherwise you will be very limited in expressing anything specific with it.



CORE CULTURAL BELIEFS FOR LANGUAGE

- Design is everyone's responsibility
- VFX is a macro-discipline
- Expression has limits
- Players tend to develop a deeper level of fluency

As a language of game design, you are speaking to a recipient: the player. Different projects will determine different rulesets and conventions. And understanding use case necessity is extremely important for developing that fluency.



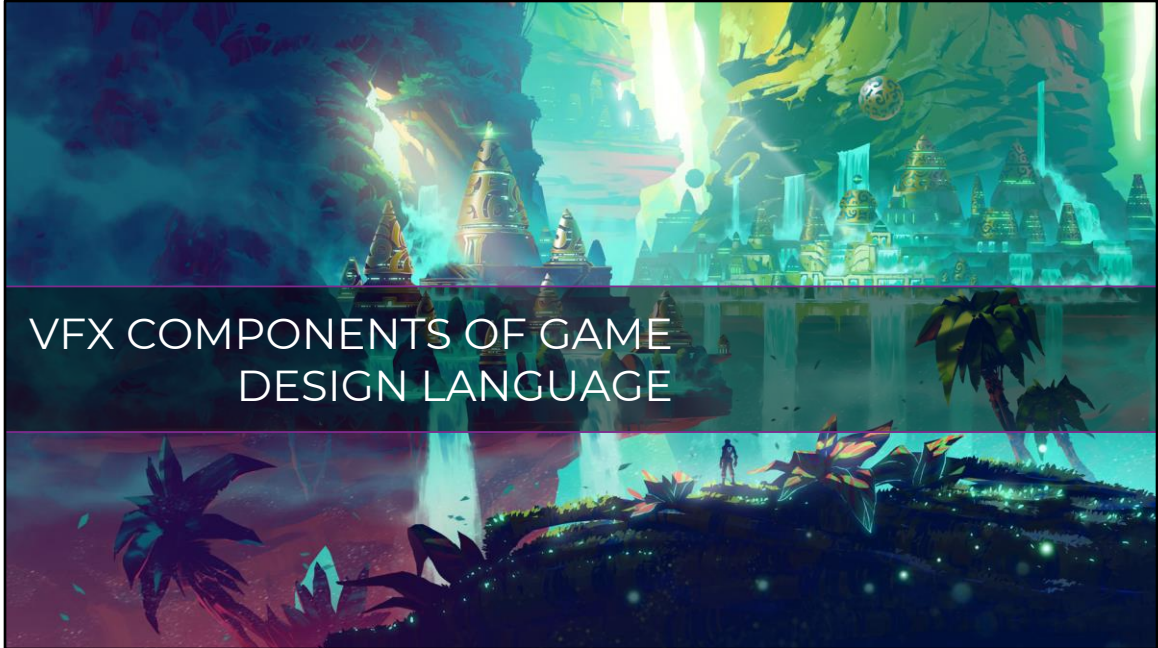
CORE CULTURAL BELIEFS FOR LANGUAGE

- Design is everyone's responsibility
- VFX is a macro-discipline
- Expression has limits
- Players tend to develop a deeper level of fluency
- Misinterpretation is unavoidable

Finally, language is inherently messy with a patchwork of borrowed solutions. Misinterpretation is unavoidable as nothing can be 100% coherent in all contexts.

Some VFX may need to be highly exaggerated to catch a distracted player's attention, while others need to be tucked away because they would be too distracting for the core mechanics.

(We will be going over some examples later related to the importance of visual bandwidth/hierarchy in VFX.)



VFX COMPONENTS OF GAME DESIGN LANGUAGE

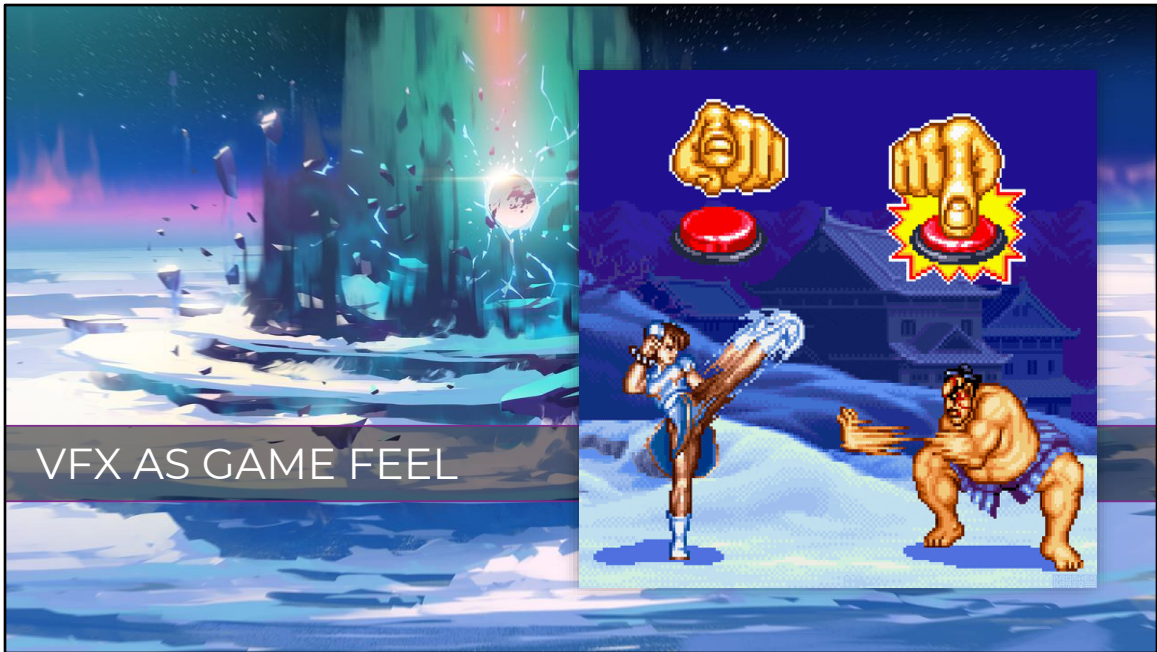
Now that our operating principles are in place, we can now dive into the components of the craft.

If VFX is a language, game design is itself the act of communication, whether it be from the designer to the player or between players themselves within the framework established by the designer.

It is the intent you convey for the experience you're building.



We will break this section into three areas of game design language: game feel, status/condition and affordance.



Game feel is the moment-to-moment satisfaction, as well as the thematic, emotional and narrative context. It's the personality and character of the verb and moment.

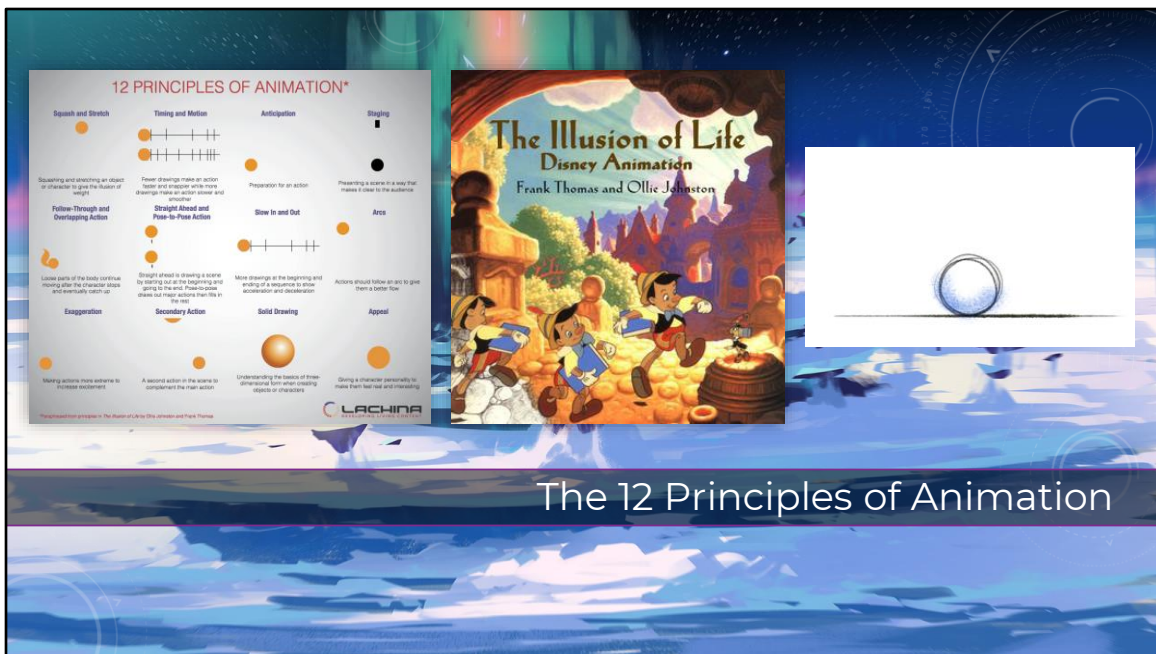
This is not to say that the entirety of game feel is solely on the shoulders of VFX: multiple disciplines contribute to it, such as animation and sound design. VFX however is one of its many key ingredients.



If a player shoots a gun or slashes with their sword, having it feel good is the game feel. If a player is experiencing an explosion impact or movement mechanics through mud, that gratification is also game feel.

Game feel is not just doing but receiving. Game feel is not always empowering but is generally pretty validating of the game experience.

Breaking this breaks the game's premise of fun to players, as well as the suspension of disbelief to the game's coherence.



The 12 Principles of Animation

To solve this, we can rely on some foundational art principles, specifically the famous “12 principles of animation”, made famous by Disney animators.

It reminds me of a joke that VFX is basically a very complicated way to animate things, but it’s kind of true. We will sometimes even write math functions out to drive animation curves.

We won’t go into it in detail, but the general idea is this: these are time-tested ways to draw attention, to prompt players through anticipation, to validate actions and experiences through follow through, and to overall imbue that motion with a uniquely identifiable appeal.



In Destiny for example, there is a very large flash on your player (after striking a pose) when you pop your super to tell other players that you are temporarily extremely dangerous until the effect wears off.

In PvP, your enemies can anticipate that they are in trouble from a game-changing action. It is less likely that they will be caught off-guard from dying without some sort of “you deserved it” foreshadowing.

Wielding it however makes you feel extremely powerful, which is in line with the accruing power fantasy of that game.

In Titanfall however, you can see these principles in action when a player calls a titan onto the battlefield. Titans can do drop damage, and players can be in different areas of the map, so signaling from above through the anticipation blast draws attention to itself, so that players can fully experience it.

At the end of its fall animation, it creates a shockwave with camera shake and ground dirt, which not only helps inform the weight and radius of the hazard, but it also

provides game feel feedback about how “close” you’ve narrowly escaped from being crushed. It adds adrenaline to the experience.



[EXPLAIN BEFORE MAKING PEOPLE WATCH IT]

Expanding further into animation, this is a bit of a personal hack I had learned, where a lot of VFX artists tend to describe VFX with other game devs with mouth sounds.

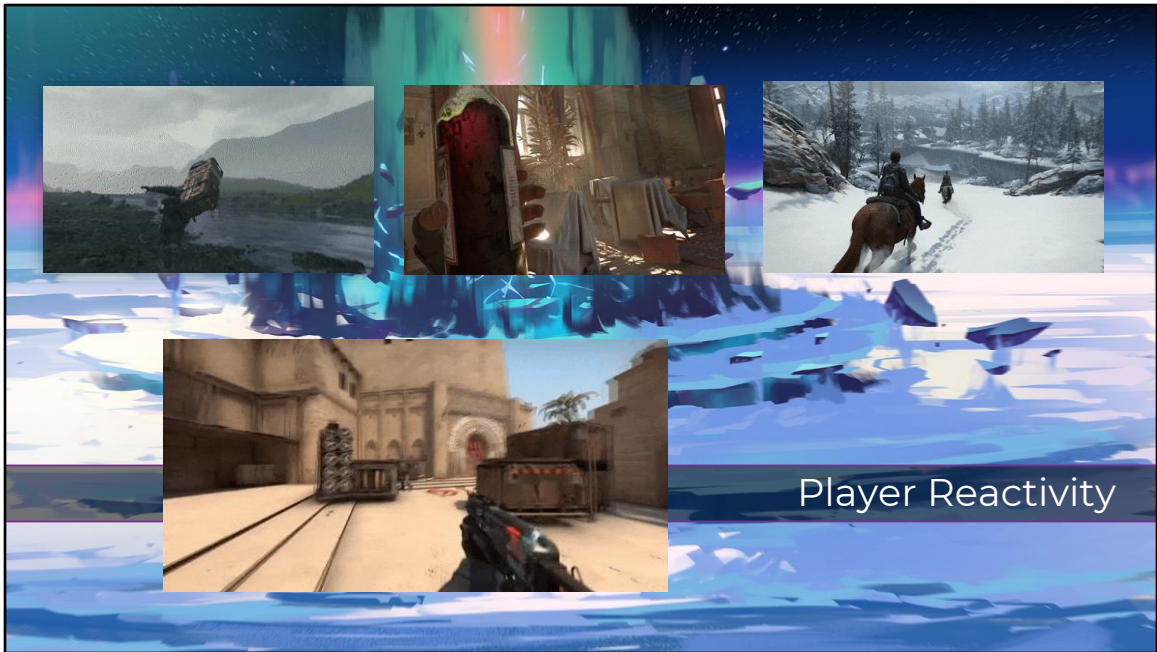
This is because sound can be much more descriptive at depicting the feeling, intensity and timing of a visual effect. You can thus also think of VFX as audio visualization.

By setting up your VFX to mimic the same feeling, with the same intensity and timing as your mouth sounds, you will be able to translate that rough sketch into game feel while adhering to the previously mentioned animation principles.

Here we have a clip of Michael Winslow in Police Academy, literally pretending to play a video game.

[PLAY CLIP]

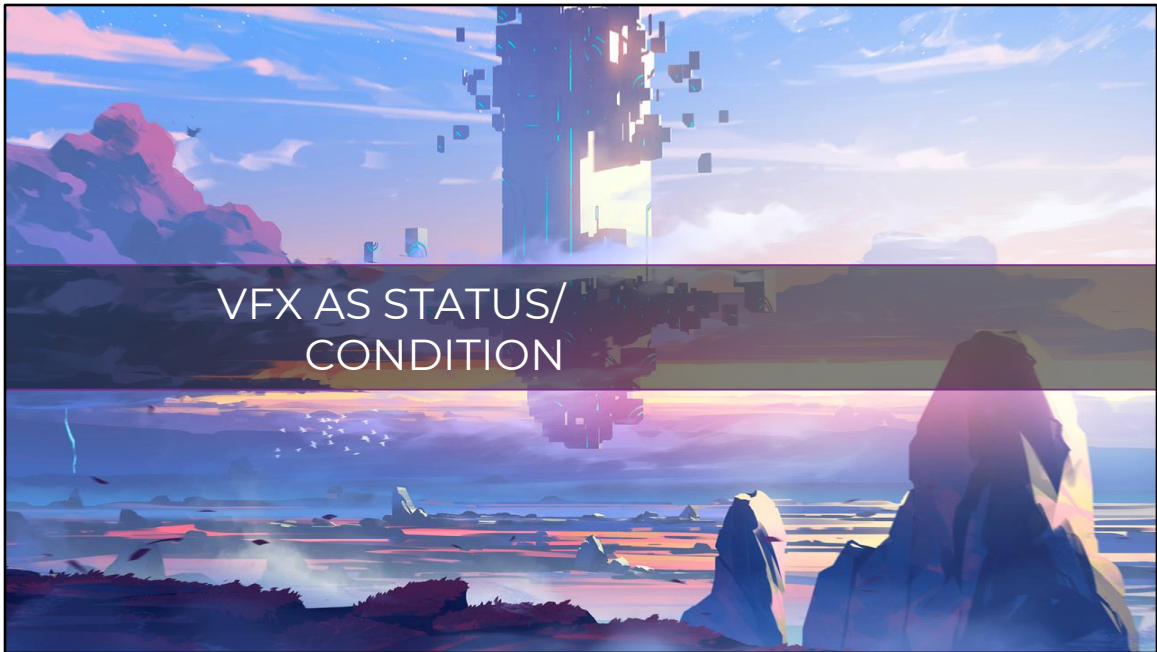
With just the sounds alone, we can visually imagine what the projectiles need to feel like in order to attribute additional characteristics such as intensity and timing.



Finally, because players have agency and free range, VFX must also be reactive to the player.

If you shoot a gun against a wall, and there is no bullet impact, players would not understand if they had missed nor how far they had missed their target.

Whether the player splashes through water or snow, or whether the visual content appears different based on the distance/angle of the player camera position, these validations cement game feel.

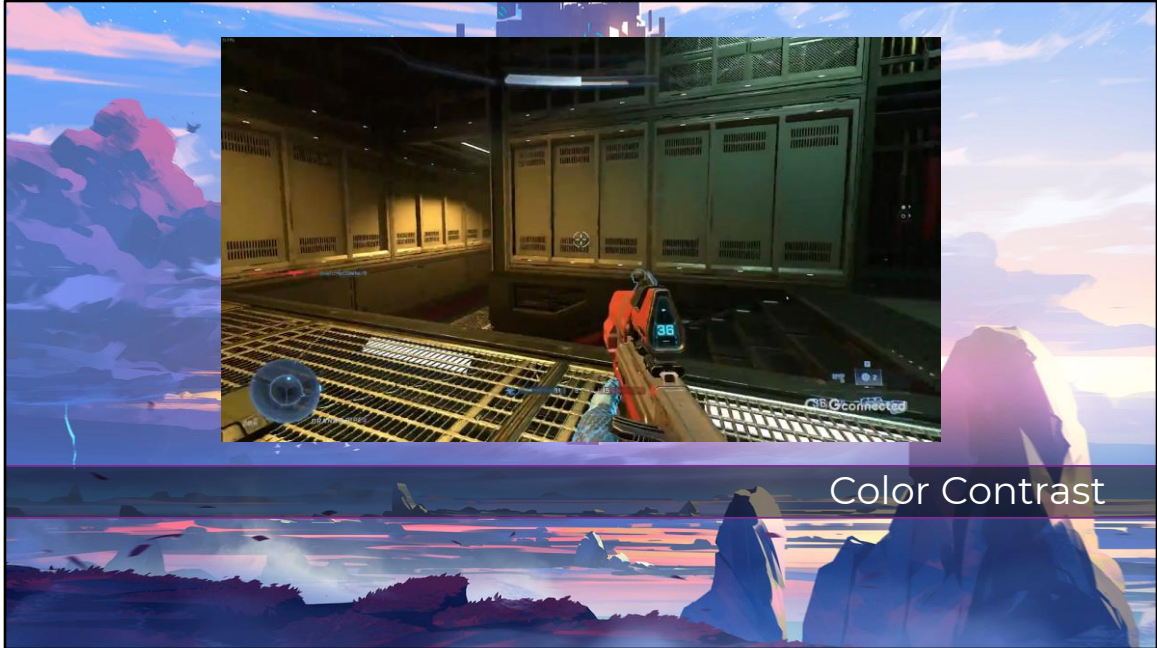


Next, let's talk about status or condition. Status is the crucial in-game information state given to the player, from hazards to health indicators.

It is signaling in its purest form, that allows for players to make informed decisions during gameplay.

Status is also able to change dynamically throughout the gameplay loop, forcing new strategies, expectations, and discoveries for players to adapt to.

If game feel was about experiencing the moment-to-moment, status provides the informational context to understand where to apply that game feel.

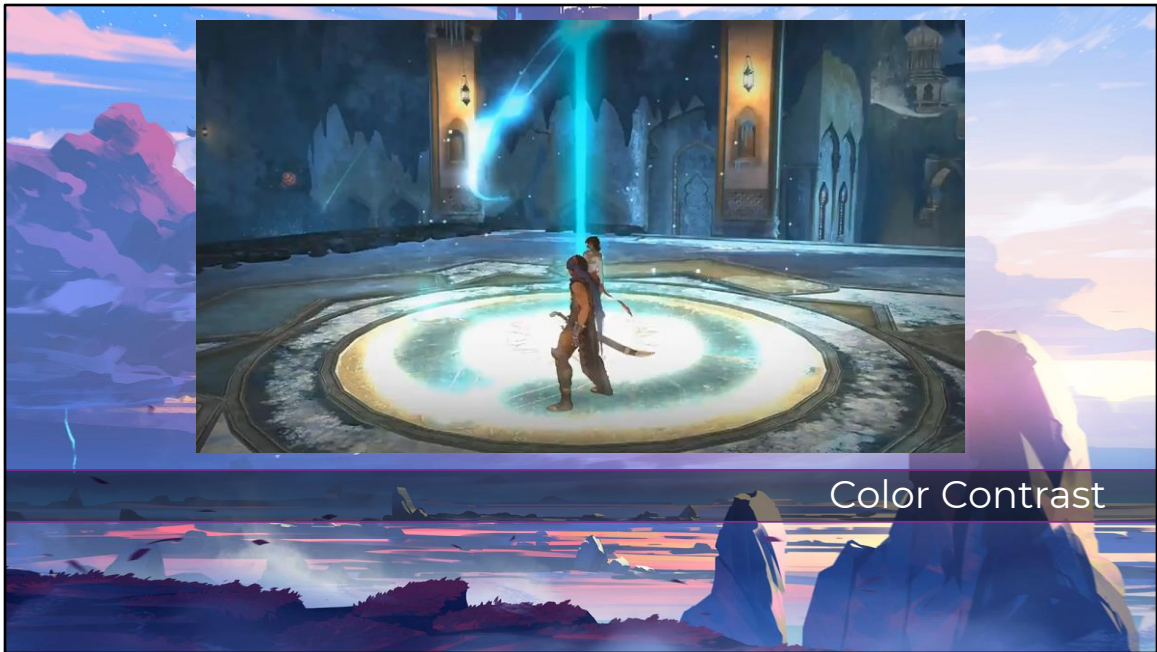


We return to foundational art principles once again by often leveraging color. It is highly effective in its range, depth and cultural associations, where it can easily indicate threat or temperature.

Importantly it has the property of contrast, which we can leverage for use cases such as damage type, rarity, or faction alignment (friend or foe indicator.)

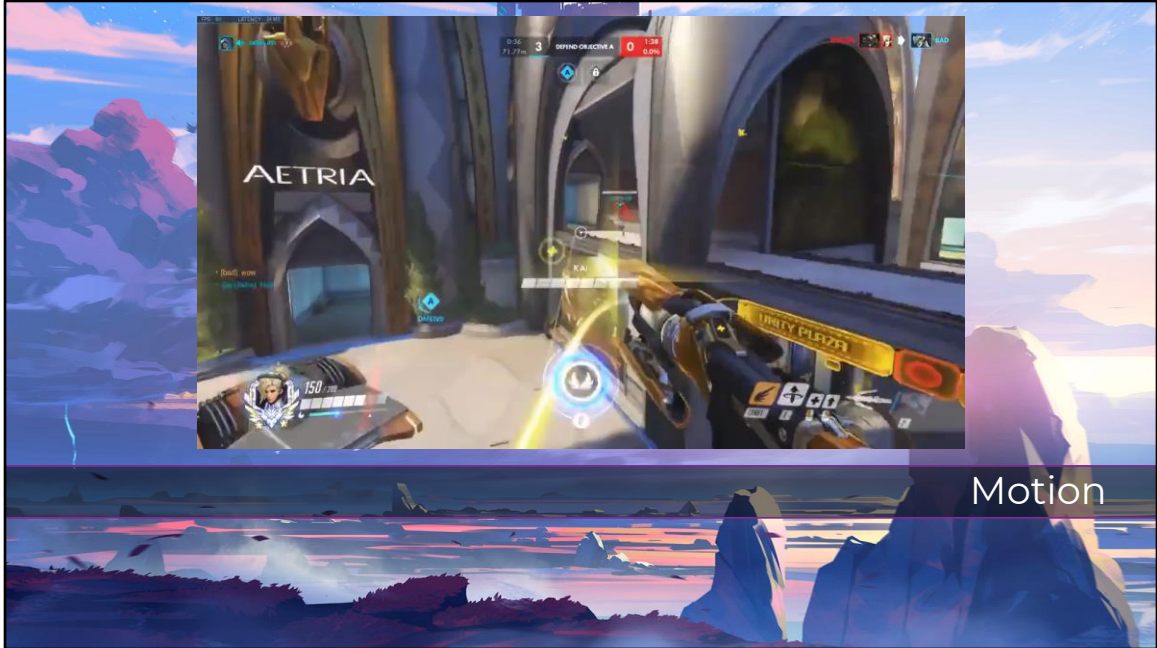
In Halo Infinite, in order to allow for increased character customization with color, players rely on red outlines to indicate enemy targets (and blue for allies) instead of armor color. This is a great use of indicating faction alignment.

Note however that color is a common accessibility concern (colorblindness is common), and thus it should NOT be the only source of displayed status. (I believe Halo Infinite provides a lot of additional options.)



The basic principles of color theory can be applied, similarly to how animation principles apply to game feel. Color can establish an emotional tone and progression.

In the 2008 cel-shaded Prince of Persia game, the player has to cleanse these areas from corruption and the use of color is not only narrative but it also displays a permanent change of status to that section of the open world.



Another strong technique is motion because it too can depict contrast, while also avoiding the accessibility issues inherent to color.

This sounds very similar to the animation section about game feel because it is. The difference however is the context in which it is applied.

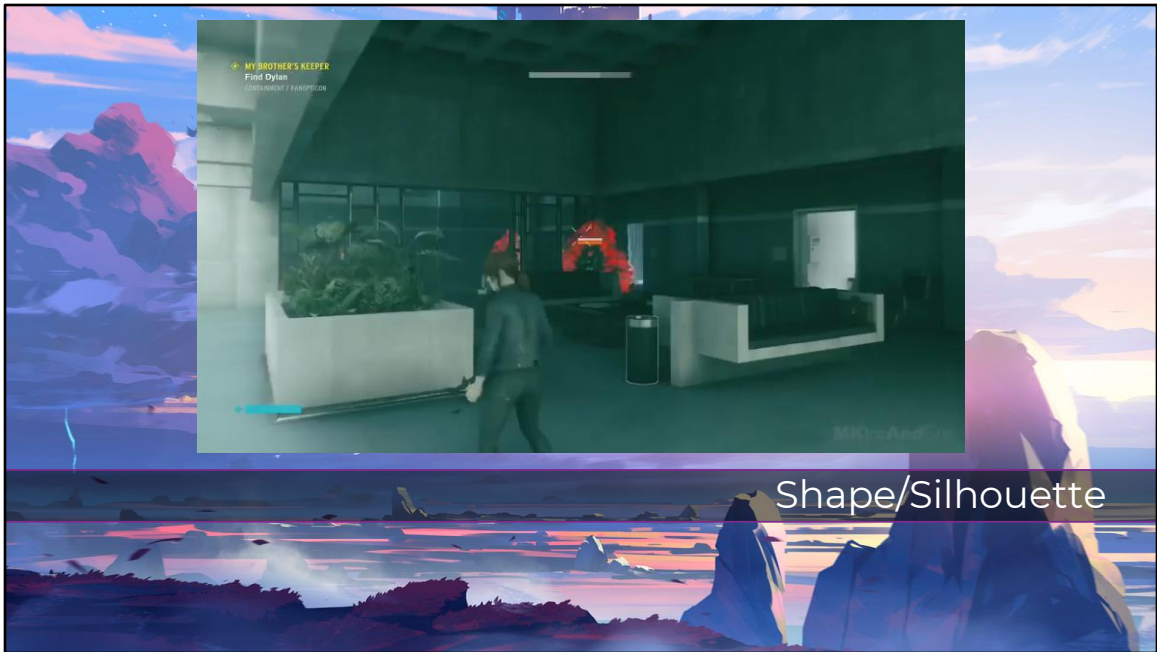
In Overwatch, the character Mercy is actively playing a healer role in the middle of an action-paced battlefield. The motion of the tether coming out of her wand is subtle in contrast to the many damage abilities that other players are executing at the same time.

This general idea stems from the GDC Diablo VFX talk by Julian Love back in 2013, where he describes a standardization where motion faster than a heartbeat tends to better communicate danger whereas motion slower than a heartbeat tends to communicate safety.



This idea is so ingrained that the game Worms uses this to comedic effect: the Holy Hand Grenade telegraphs safety after it is thrown by emitting slow comforting light rays from it, except that it completely subverts expectations by blowing up and creating a massive crater right after.

In this clip, it also triggered a chain reaction that caused a few trip mines to activate. It is the motion of the blinking lights that communicates to the player that detonation is imminent.



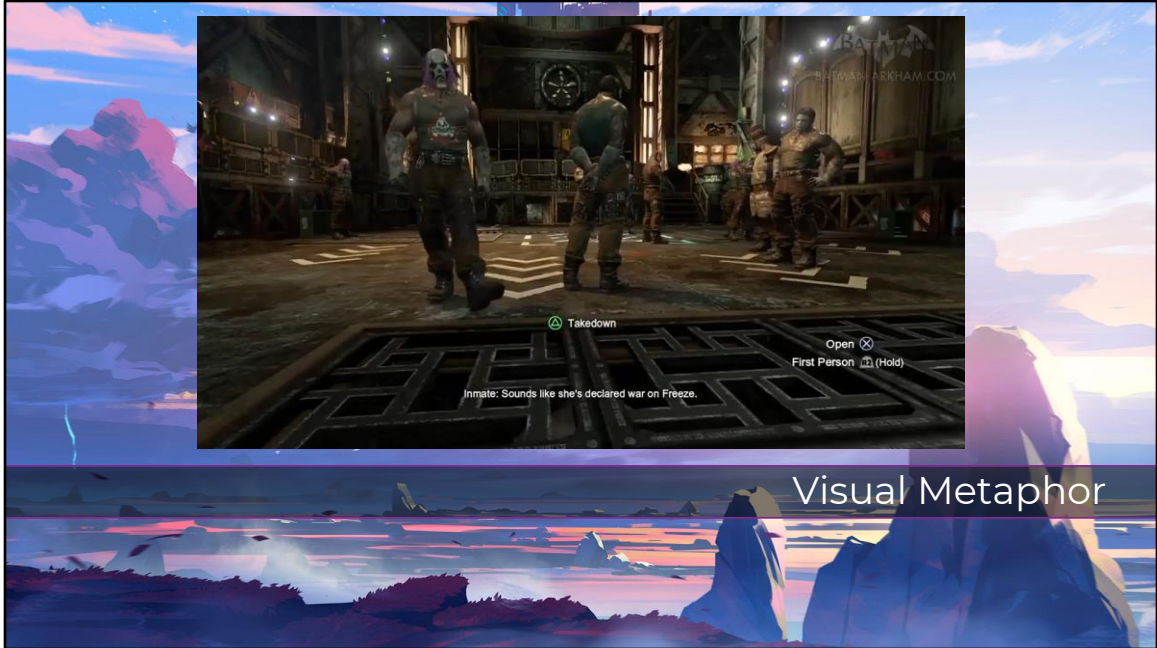
Shape and silhouette can also be useful to us. While it has traditionally been a primary visual design feature for solid objects, it can occasionally be applied to VFX.

Examples may include something as complex as a sci-fi hologram to something as simple as a texture with symbols for a rune puzzle.

Shape language can also designate different themes and factions more reliably than color due to avoiding colorblindness issues.

In Control, the player must fight off this invading mysterious force called the Hiss: they unleash this large cloud of paranormal dust with trail spikes when they die, whereas anyone alive are simply humanoid.

Note however that shape and silhouette play more than just a role of status in this game, as it also directly contributes gameplay function and mood. The smoke obscures the space temporarily, rising the sense of tension by increasing the player challenge from making enemy silhouettes harder to see.



Finally, visual metaphoring is extremely useful because it imbues a personality characteristic by literally mapping whatever themes you are comparing to onto a visual effect.

In Batman Arkham City for example, when Batman fights thugs, he is able to rely on visual symbols such as spinning stars above people's heads (whenever they are stunned) and flying bats (whenever they are downed.)

These creative choices are not only thematic, but they also stylistically draw from the language of comics and cartoons, which is something that works in favor of the game's appeal. A significant amount of the game's audience grew up with Batman, especially from the Animated Series which shares the same voice cast.

We will explore the value of VFX for anchoring visual and emotional familiarity in a later slide.



The last component in our list is affordance, which is a term coined by Don Norman in “The Design of Everyday Things”, and that has been used by game designers ever since.

It is simply the visual inference of utility, that prompts users to interact with them. (Think: doors have handles and therefore they can be pulled open.)

Affordance in games is the discoverable potential action of the player. The player needs to understand the rules of how to interact with gameplay objects in the world.



We can revisit shape and silhouette just like in the previous section. However, it is even more important as a means of affordance. It is often easier to just leverage existing solid geometry when possible, but sometimes VFX usage is unavoidable.

It is common for example to add beacons to items to lure the player towards them, as they are easily noticeable at player viewing height above other obstacles.

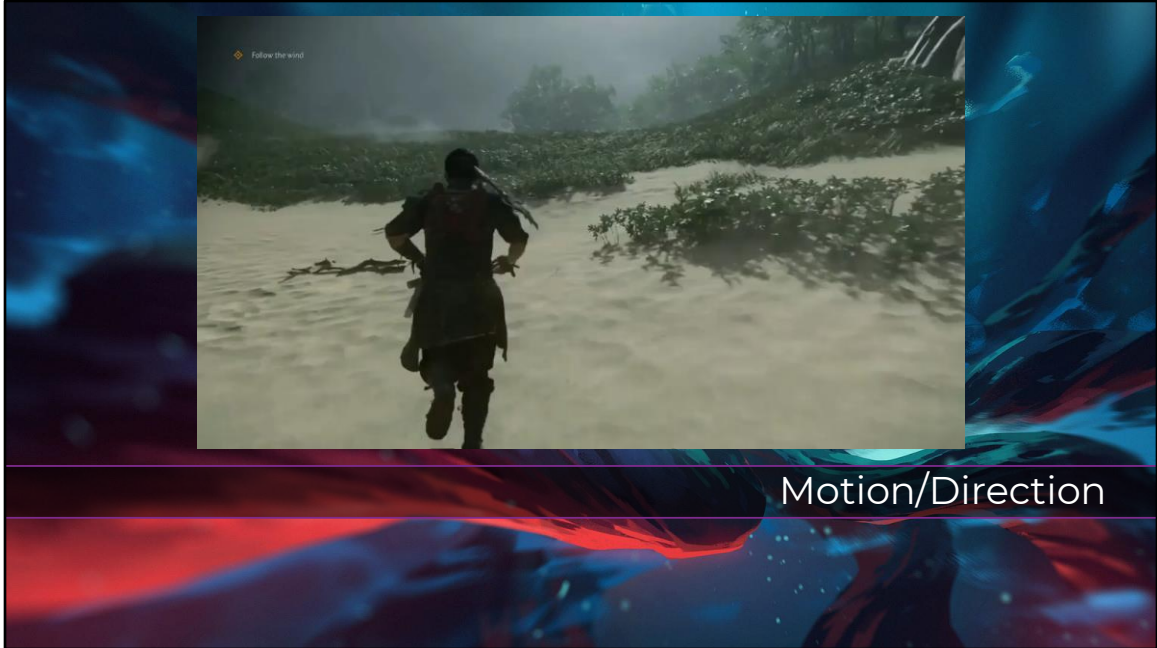
In Destiny 2, this specific game mode requires you to collect motes. They are important enough for the player to sometimes deprioritize shooting targets because these motes disappear only within a few seconds if not picked up.



Ground circles are also a common visual affordance for players to step into them, sometimes for healing wells or capture zones. They are round, organic and cozy. They often feel safe or familiar.

In this extreme example, we can see a player in Fortnite standing inside of a shrinking circle in order to win the game as the last survivor.

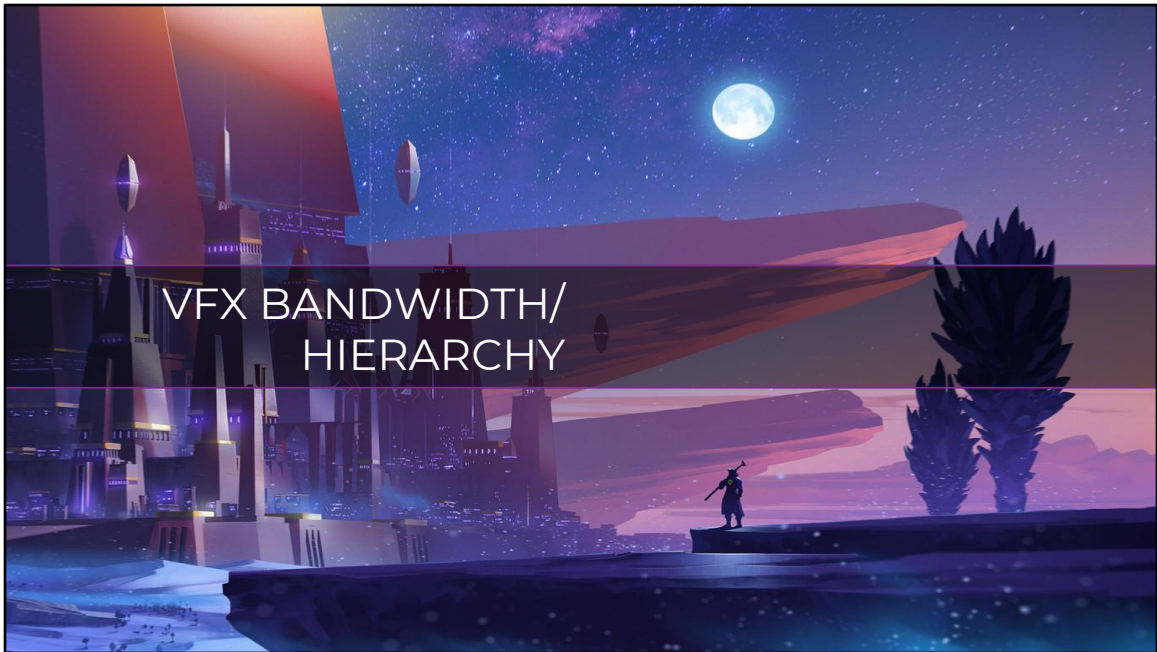
Note however that circles can have an extremely contextual affordance, such as indicating a player's ability range or an enemy's sight range. Doing this requires additional elements of VFX language, such as color to denote faction.



Affordance can also be directed through motion and direction. A classic example would be some blinking light in the distance to draw you towards it.

In Ghost of Tsushima however, the developers were able to build an entire mechanic where the wind blows wherever the player needs to navigate to in the open world.

This solution felt not only novel but also elegant because of the thematic tie-ins with feudal Japan's Shinto religion that has a large emphasis on the natural world.



As you can see, VFX is a very robust language with a lot of tools at its disposal to express a variety of signals. However, these signals can easily get jammed.

Effective VFX needs to account for bandwidth and hierarchy. Too many things calling for attention at the same time will negatively impact the player experience through confusion, frustration, reduced play time and poor retention.

Not accounting for these limitations is both bad creatively and for business.

[there IS such a thing as too many particle effects]



Remember the earlier section about game feel? It is called as such because it is designed for feeling first.

Muzzle flashes are an excellent example of this. They inform players that the gun is firing, but they should never be so noticeable that it distracts the player away from prioritizing enemy targets.

In Doom, most players are never consciously aware of the muzzle flash because they are not supposed to be staring at it.

If the player is noticing the muzzle flash texture cards during gameplay, the VFX artist still has some polish work to do because the highest priority concern for the player is threat assessment.

Nothing beats the clarity of strong fundamentals that are often simple. Sometimes finely tuned subtle cues are more than enough, such as bloom, rumble, camera shake, and so on.



As usual, contrast is foundational for ordering attention prioritization.

Elements that need to be differentiated should be noticed as separate, whereas elements that have a thematic or causal relationship need to be tied together.

The portals in the game Portal for instance have the same shape because they allow for the same player actions to occur with them (like walking through them.) However, they are differentiated through color to ensure that the player understands which portal they are positioning/moving towards at any given time.

Additionally, the Portal gun in this clip is set on an orange platform while shooting blue portals. This is to subtly reinforce the causal relationship between both orange and blue elements.



VFX STANDARDIZATION/ REUSE

Not every single VFX asset can be, nor should be, unique. Languages require coherence for scalability.

Standardization and reuse is widely considered to be a smart use of production time. Contrary to common sense, it can also increase the perceived value of content in some cases.

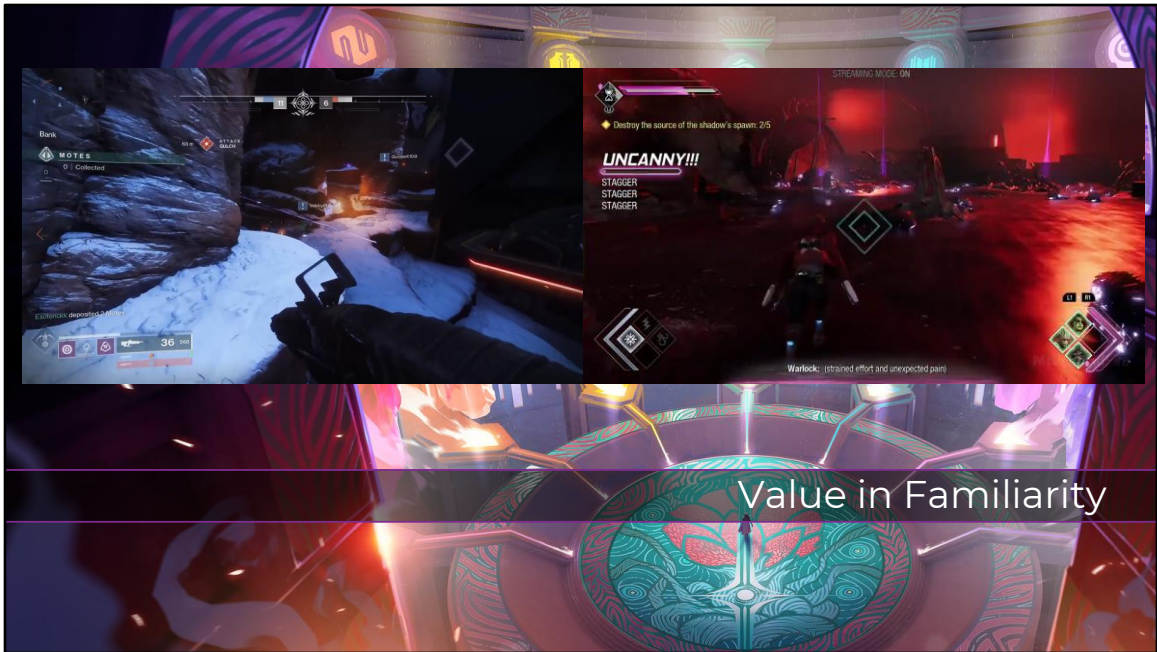


By establishing the rulesets of your VFX language, you are constructing a grammar syntax that is capable of being expressive. Often this is simply referred to as art direction.

It is not about the abundance of unique vocabulary, but rather it is about the construction and sequencing of full sentences that can communicate game design or emotional tone in many different ways.

Here I am presenting different visual elements from Death Stranding which uses black liquid and ash heavily throughout the game to tie different characters, creatures and world-building elements together throughout its narrative storytelling.

It is clearly identifiable that they all belong to the same universe despite different actions occurring.



Re-use and standardization leads to establishing archetypes where players feel rewarded for recognizing similar patterns in different contexts or even products.

In both Destiny 2 and in the Guardians of the Galaxy game, you can identify the similar usage of beacons to draw the player's attention to them. The player does not have to relearn new mechanics, these become part of an intuitive shared vocabulary.

As you can see, you can kit bash vocabulary from existing content or borrow it from different sources, similarly to how oral languages rely on portmanteaus and loan words respectively, to either build new meaning or to reference equivalent ones out of utility.

You functionally do not have to train players from scratch repeatedly with great cost efficiency. You can build player experiences that focus on rewarding mastery and investment over simply learning new sets of words.



Reusing existing standards also allows for unique opportunities to tap into nostalgia through callbacks from earlier sequences. Furthermore, you can anchor emotional undertones based on the prior journeys that the player had experienced.

In the Assassin's Creed franchise for example, the loading screen always has the main character walking through a large empty space, often with fog and geometric patterning as its VFX language. This familiarity is a constant and a staple that players end up anticipating.



VFX becomes even more valuable as a marker of brand identity.

It screams value to players and pushes them to memorize their experiences, and to share them with others.

The famous “digital rain” effect for example is so iconic, that it is immediately recognized as part of The Matrix franchise in pop culture.

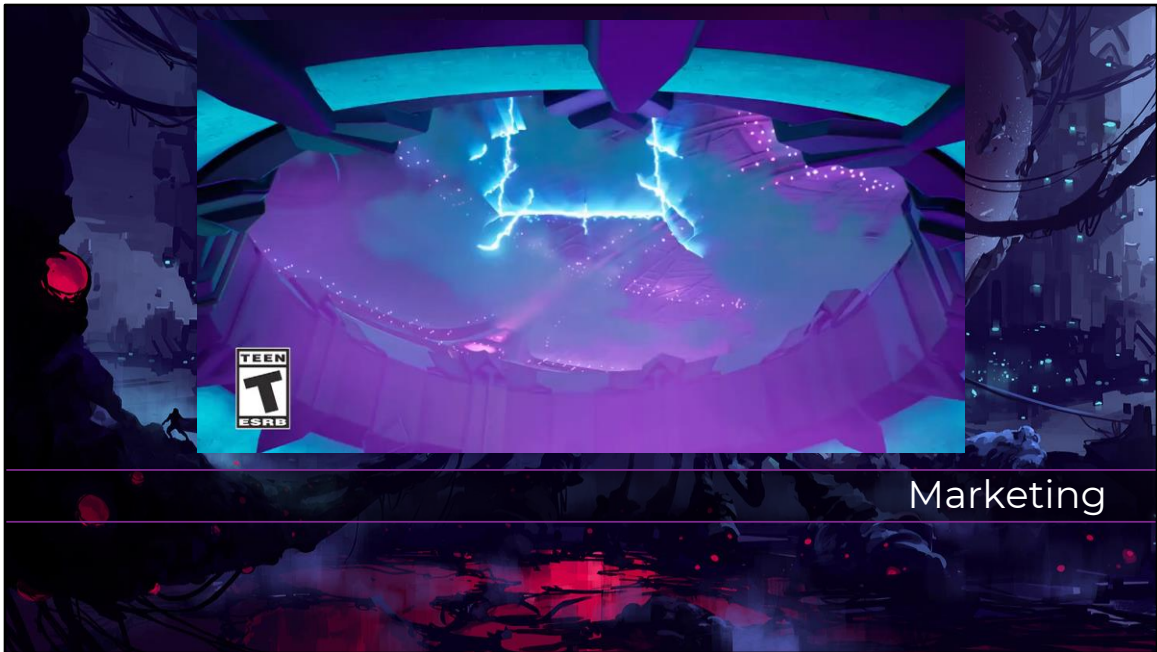


It comes to no surprise that VFX sells games. As marketing tools, they communicate very effectively to players what their promises and expectations should be.

They are an essential marketing hook, as in they display whatever the unique selling point of the product is, that can further be propagated through word of mouth.

This clip comes from the Battlefield V trailer which sells the promise of large-scale destruction and amazing graphics that the franchise is known for.

VFX brings weight to player verbs (shooting, driving) and present the emotional tones of the experience.



As an additional note, especially with live service games or anything with expansions and DLC, players need to understand why they need to come back to the game (especially if there are new items or abilities to collect that match a seasonal theme.)

This example is a teaser trailer from Fortnite, where VFX is showcased very heavily to promote an in-game concert with Ariana Grande, hooking players into a unique experience that is worth logging into the game for.

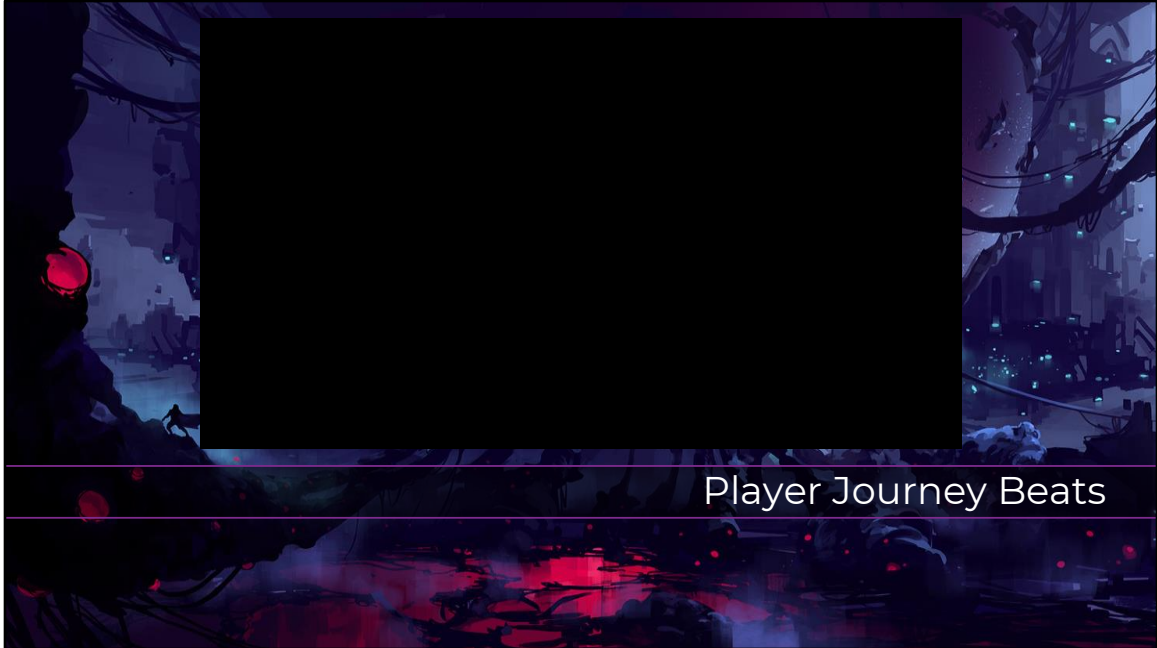
(It was literally almost entirely VFX content as teaser shots.)



The power of VFX also translates over to narrative, capable of not only underlining the most incredible emotional experiences, but in turn cementing it into collective memory as pivotal moments of the player journey.

These are the instances that get players excited to share with one another, and that as a business, we can tap into for nostalgia later on.

In this example, I am presenting the famous title card sequence for Ghost of Tsushima, where the player rides a horse into an open field just as the music reaches its crescendo. It's that flock of birds flying away that really nails the beauty of the experience.



But perhaps a more directly commercial example for VFX is for loot boxes and rewards. They too are part of the player journey that players get excited over.

In Hearthstone, unsealing and earning them becomes a highlighted moment of the game experience, especially if you win big on the rare occasion.

Additionally, the intensity of the VFX is tied to the rarity of the card. The emphasis on large wins skews the emotional takeaway towards being overall positive, even if they may not win as big nearly as frequently.



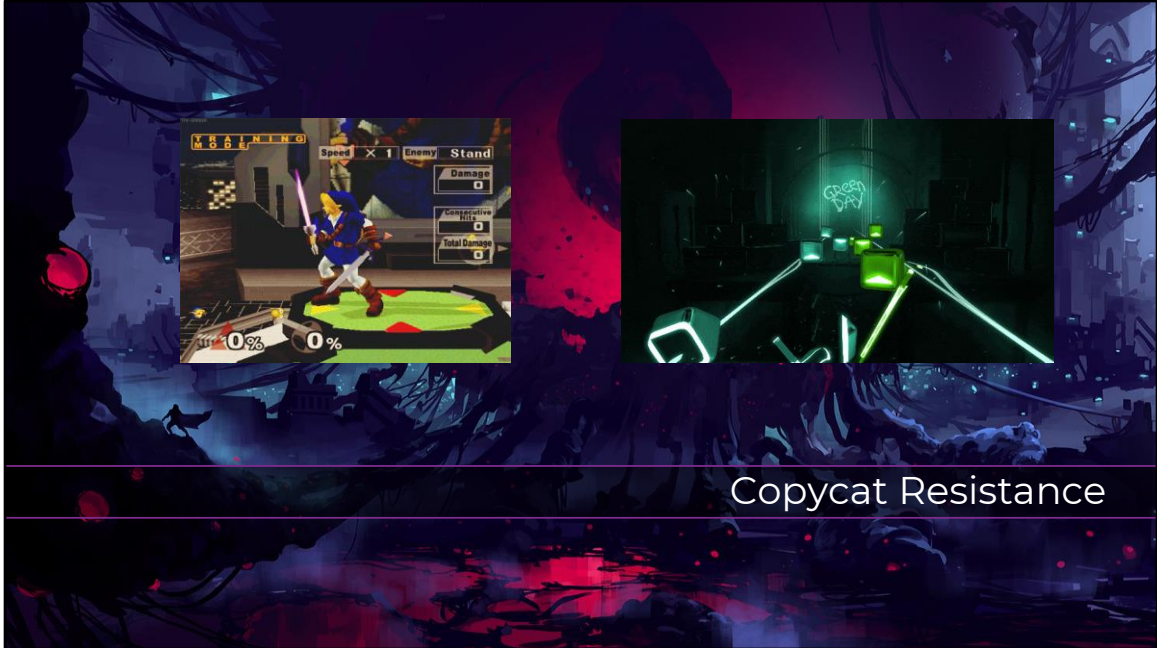
Copycat Resistance

One of the signs of success is that mimicry, or even plagiarism, is inevitable. But this is a test of strength for your brand identity.

If the VFX in your product is successful enough as a brand identity marker, then any copycats will always remind you of the original source material.

Could any game truly steal the iconic light saber design, without people immediately thinking about Star Wars? One would immediately assume that they were from the same franchise/universe first, whether it be Star Wars: Fallen Order or LEGO Star Wars.

It therefore does not only bring value, but also protects it and even reinforces it.

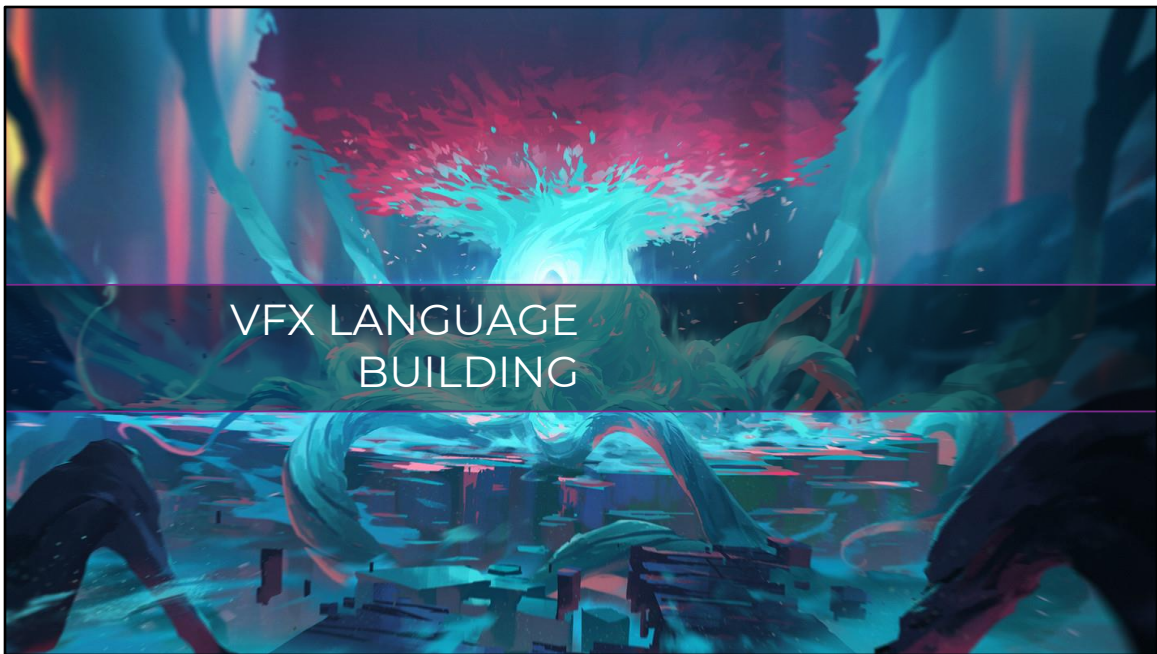


The design of the light saber is so iconic, that even when other games steal its visual design, gamers will still call them light sabers.

Super Smash Bros may call it a “beam sword”, but everyone else refers to it as the light saber.

When people discover Beat Saber for the first time, they would describe it as Guitar Hero with light sabers, not wands.

The VFX of the light saber is so iconic, you literally cannot dissociate the experience from Star Wars.



So how do we build all of this? The book is still being written somewhere, and there are going to be a lot of different solutions that are built for different problem sets.

Just like there is no singular game design approach to solve all needs, there is no singular VFX language. It must be built in tandem.

We need to setup a creative cultural process that can foster this kind of innovation. One where VFX is both a driver and a jumping point.

It will not be enough to set it up as an after-thought nor as a final piece of polish. Late reactivity will not set up VFX for success.



As a reminder, here are the core cultural beliefs that I had established earlier in this talk, on the principle that language emerges from culture.

It would be entirely expected for others to produce a different list based on the different problem sets they face, but this is what I have found to be most effective from my work experiences.

We are therefore led to a series of potential conclusions. Again, this may vary based on the available talent and values you carry.

This is not any sort of revolutionary proposal, but rather it is a confirmation of successes in this type of process.



Strong design requires alignment. Goals must be defined early, making alignment and scoping much more manageable to achieve.

You must have the room to speak up and to actively engage in those conversations during the process through negotiation and boundary checking.

Collaboration is always easier said than done but it is extremely rewarding for all parties when done right. Handled improperly, misalignment can break your product.



Each VFX artist will resort to different solutions based on how they learned to express themselves culturally from those past experiences. Whether they stem from animation, design, UI, engineering, and so on. VFX allows itself to be the Gestalt capable of both informing and inferring information.

Discussions must be followed quickly by prototyping and demonstrating. Answers will be yielded empirically.



You must scope the reach of VFX so that the game design language can become clear and concise. Scope is also a forcing function for creativity and resourcefulness, where an inch can be stretched into a mile.

Battles must also be picked wisely. It is in this space where leaning onto others and delegating responsibilities will help the overall product.



Ideally you would also have testers embedded into whatever feature you are developing, and you must trust their interpretation as you work alongside them. It does not matter what your communication intent was if players got confused or felt misdirected.

Building in a vacuum is the fastest way to make things that break. Reinforcing this feedback cycle will only allow you to discover additional creative opportunities from them.



And finally, effective VFX is an exercise in humility due to the amount of moving parts involved. Empathy is not just one of the most desirable core skills for teamwork, it is also a necessity for crafting messaging that accounts for the player's situational state of being.

Every person will be different. It is this social exploration and unknown that makes it necessary and worthwhile to build this language. Small efforts to connect and communicate are more desirable than none.



Thank you for listening to my talk. I hope that you were able to get something valuable out of it.

I'm giving a shoutout to all of my colleagues, friends and family who have supported me through both life and career, some of whom are sitting in the audience right now. To my sister Xu-An and to my coworker Samir who helped me rehearse repeatedly.

I would also like to thank Veer Sharma, my GDC advisor, for inviting me to do this talk.

Also big thanks to Counterplay Games for providing slideshow graphics to make this presentation pretty.

Thank you to everyone in my life. 😊

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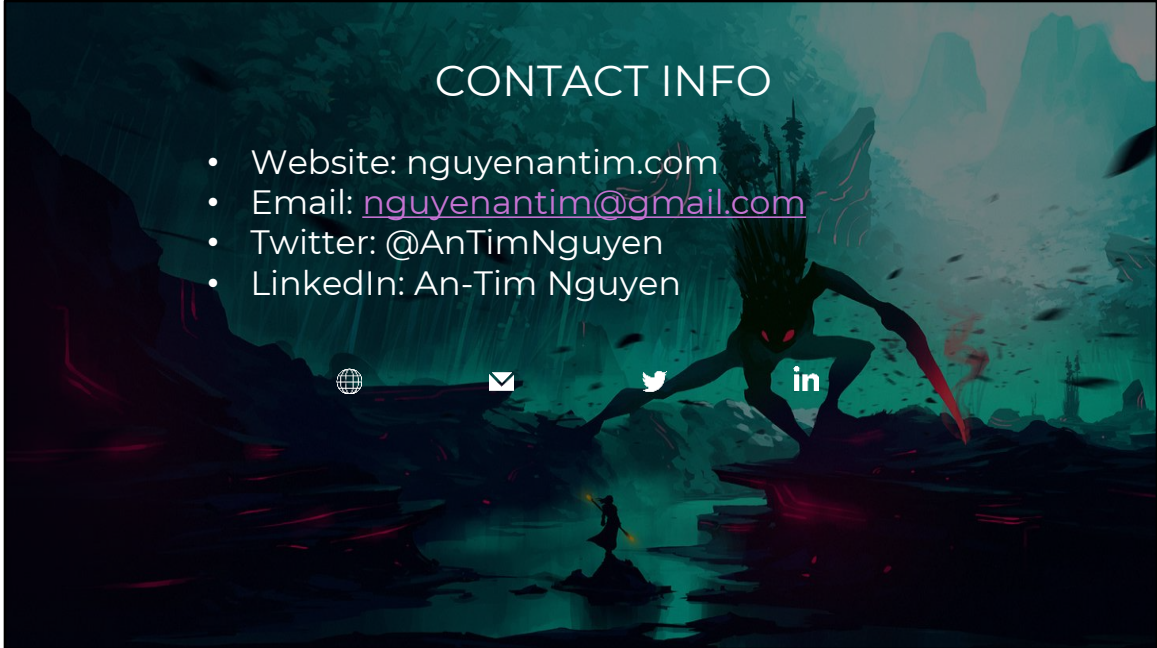


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By the way, Counterplay Games is hiring! Please check our careers/jobs section on our website.

Maybe we'll get to work together in the future.



Finally, here is also my personal contact info, feel free to hit me up and I will respond as best I can.

That's all I have folks! Thank you.