R.E.A.L.M

Research in Environmental Art and Level Mentality

01.

VR/Collaborative Research & Design Study

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- **Interactive VR experience**
- Every part of the level isolates a psychological design variable
- Focus on
  - Space
  - Light
  - Sound
  - Interaction

PROJECT OVERVIEW.

NARRATIVE & INSPIRATION.

NARRATIVE FRAMEWORK

- Inspired by Strixhaven: A Curriculum of Chaos
- Fantasy lowers realism expectations
- Dungeons & Dragons logic supports environmental storytelling
- Stylized low-poly for clarity and performance

WHY VIRTUAL REALITY?

04.

- Virtual Reality increases retention and and engagement.
- Presences depends on comfort and consistency.

IN VR, THE ENVIRONMENT ISN'T DECORATION. IT'S THE INTERFACE.

02

05.

THIS RESEARCH WAS CONDUCTED BY MY OWN EXPERIENCES AND VARIOUS RESEARCH.

COLLABORATION

WORKFLOW & ORGANIZATION

WHY COLLABORATE?

OUTSIDE RESOURCES BESIDES MY OWN KNOWLEDGE

- DM is the illustrator
- Outside perspective of professional workflow.
- Better understand a none-game developer mindset.
- Get experience working with friends in a professional but kind way.
- Learn more about areas im weak in.

WORKFLOW & COLLABORATION

START

01

The hardest part is starting.

- Brainstorming
- Bringing multiple visions together

ORGANIZATION

02

- Creating very solidified document with TIMELINE.
- Having a drive with access to research and github.

COMMUNICATION

03

- Weekly meetings and updates
- Setting very specific needs and expectations for each other.

UNDERSTANDING

04

Business isn't personal.

- Understanding its a team effort and everyone's thoughts count.

THIS RESEARCH WAS CONDUCTED BY MY OWN VR EXPERIENCES AND VARIOUS RESEARCH FROM ARTICLES AND OTHER VR PLAYERS.

THE ACTUAL RESEARCH

RESEARCH QUESTIONS.

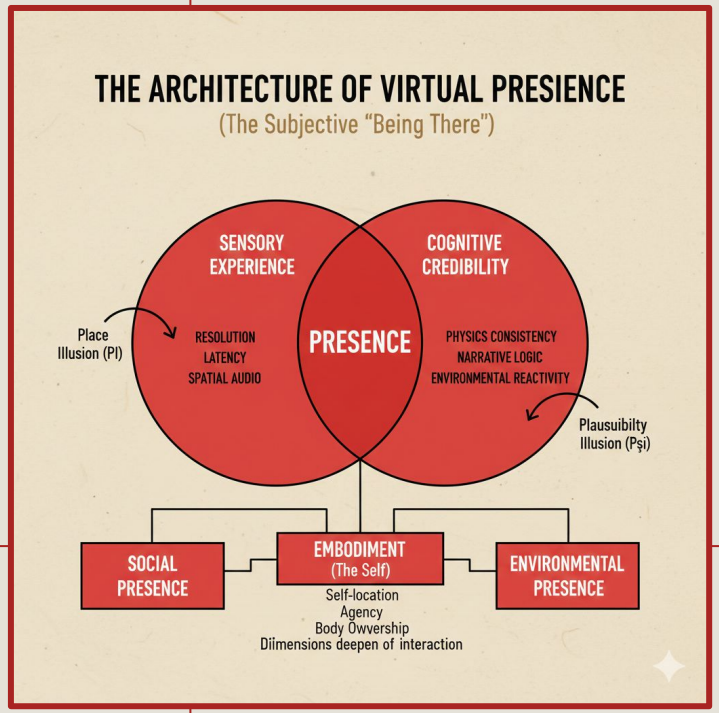
09.

How does spatial scale affect awareness?
How can lighting guide attention naturally?
Does limited interaction improve presence?
Can space tell story or direction without UI?
How does VR interactions translate to realistic movement?

WHAT IS PRESENCE?

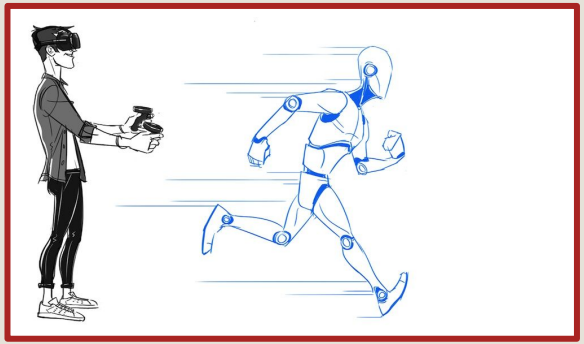
PSYCHOLOGICAL FEEL OF **“BEING THERE”**

- Built from:
  - Comfort
  - Synchronicities
  - Plausibility
  - Responsiveness
  - Self-embodiment
- CONSISTENCY is everything



PRESENCE IS FRAGILE. ONCE BROKEN, IMMERSION RARELY RECOVERS

Locomotion Types	Immersion Level	Comfort Level	Best Use Case
Teleport (Blink)	Low	High	Puzzle games, exploration, first-time users.
Smooth Artificial	High	Low/Medium	Shooters, RPGs (requires "VR legs").
Room Scale	Very High	Very High	Escape rooms, detailed environmental interaction.
On Rails	Medium	Medium	Narrative experiences, "rollercoaster" rides.



ONCE THE SENSES DISAGREE,
REALITY DISSOLVES.

THE LOCOMOTIONS.

DO NOT!!

HEAD LOCKING

01

Forcing the players head to turn for a cutscene.

- Players head must always map 1:1 to the camera.

ARTIFICIAL MOMENTUM

02

Accelerating or decelerating/using momentum when the player raps speed.

- Inner ear detects changes in velocity.

HEAD BOB

03

Added bobbing to walking or shaking the screen.

- Induces headaches almost instantly.

HORIZON ROTATION

04

Tilting the camera sideways when turning.

- Humans rely on the horizon for balance. If horizon tilts, player loses balance..

PLAYER COMFORT.

TELEPORTATION

Using controller to set location

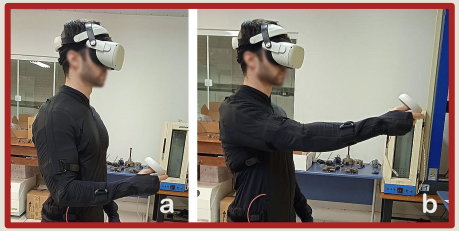
- **Disorientation**
- Spatial sound effects
- warps

PHYSICAL

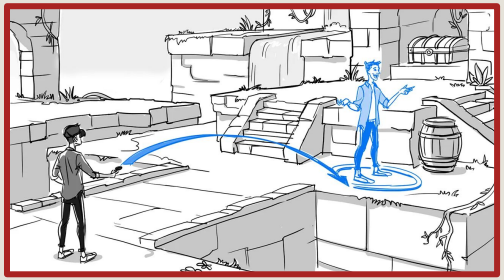
World pulling, arm swinging/clawing

- **Fatigue**
- Support seated use

GORILLA ARMS

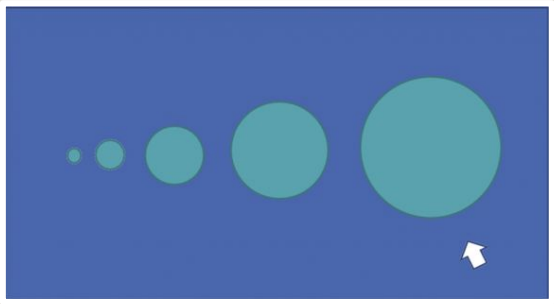


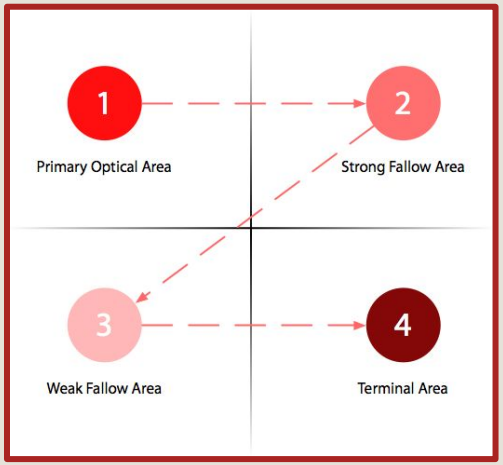
- Most commonly from text input
- Single arm interaction = less physical fatigue and cognitive workload



COMFORT AND MOBILITY WAS PRIORITIZED OVER REALISM TO MAINTAIN LONG-TERM ENGAGEMENT.

GUIDING THE PLAYER.





- Keep critical gameplay information at or slightly below eye level!
- FITTS Law
  - Where is it faster to move the cursor?
    - Large and close focus to user
      - Neck strain
- Gutenberg Diagram
  - Users read in an “Z-shape” pattern

LIGHTING GUIDANCE.

ATTENTION AND NAVIGATION

- **Breadcrumb technique**
  - Using lit areas or light fixtures to lead the player toward objective.
- **Contrast and gaze**
  - Human vision is naturally drawn to the brightest point in a scene
  - **Green lit doorway = safety**
  - **Red light = danger**
- **God Rays**
  - Spotlight objects of narrative significance
- **Squint test**
  - Squint your eyes to test inteend goal and make sure the path is prominent
- **Naturalist cues**
  - Logical light cues for immerisan

LIGHTING COMFORT.

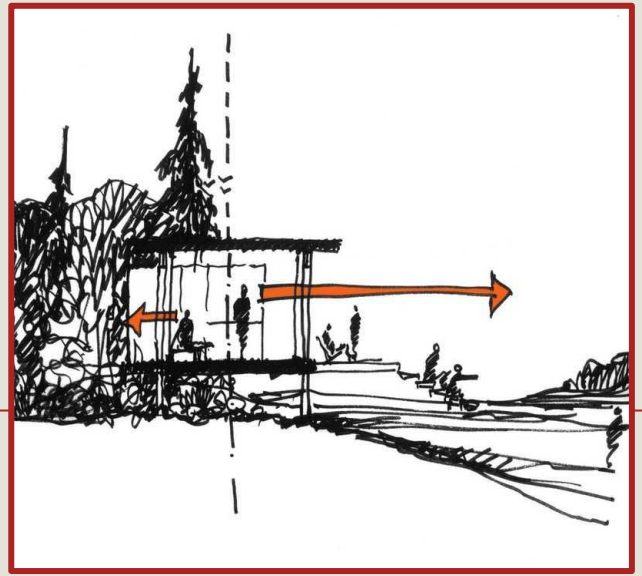
VISUAL FATIGUE AND PHYSICAL DANGER

- **PHOTOSENSITIVITY**
  - Avoid high frequency color or brightness
  - A transition of 20% or more in brightness across 80% of the screen should be limited to 3x per second.

- **VISUAL FATIGUE**
  - Avoid high-frequency in color temp and highly saturated colors to **minimize fatigue.**
- **CONTRAST AND ALIASING**
  - Extreme light and dark contrast in close proximity can worsen the appearance of aliasing (shimmering edges), which can lead to **eye strain.**

BY PULLING THE GAZE, YOU DEFINE THE JOURNEY.

- Prospect-Refuge Theory
- Confined spaces increase attentiveness
- Windows act as psychological relief
- Anchors reduce anxiety



SPATIAL PSYCHOLOGY.

The dorm rooms layout amplifies environmental awareness without inducing stress.

SCALE & METRICS

BODY BASED SCALING

- Avatar atcts as “anchor” in virtual world
- Humans have subconscious understanding of size of everyday objects.
- Hands to large = “Giant Effect”
- **ACCESSIBILITY - Avoid physical blockers with “summoning” or “grabbing at a distance” (ray-casting).**

INTIMATE ZONE

- Ranging 0.2 -0.4 meters
- Avoided for primary interactions as objects this clause cause users eyes to struggle to focus, leading to **eye strain.**

PERSONAL ZONE

- Extending 0.5 - 1.2 meters
- Optimal for tactile interaction and primary UI panels
- Roughy **arms length.**

PUBLIC ZONE

- Going to 1.5 - 3.0 meters
- Reserved for **shared content and environmental scenery.**
- Relies heavily on motion parallax and atmospheric perspective.

THE **“SWEET SPOT”**

- Higher interactivity increases engagement and concentration.
- Too many interactive elements can cause interatavie **overload.**

INTERACTIVE BASELINE

- If one drawer opens, the player expects every drawer to open.
- Better to have fewer, **higher quality interactive zones.** Than high density of objects that appear interactive but are static.

IMMERSION IS MORE IMPORTANT FOR RETENTION THAN INTERACTIVITY.

PRESENCE VS PERFORMANCE

- High density physics/interactives can **tank frame rate.**

INTERACTION DENSITY.

FUTURE: DEVELOPMENT

- Add low-poly assets
- Implement appropriate sound systems
- Test lighting logic
- More reactive environments
- Fine tune physics feedback

Most importantly, **implement my research.**

Future systems will remain subtle, reinforcing presences rather than overwhelming it.