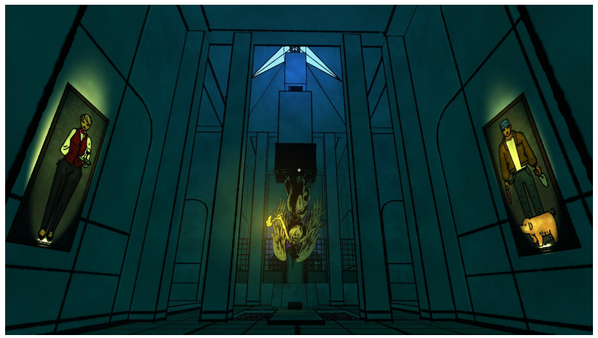
Designing Radically Nonlinear Single Player Levels

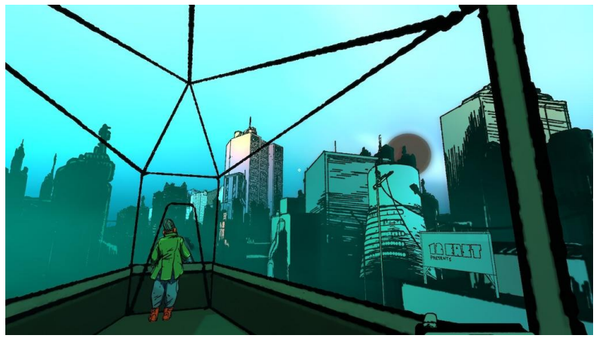
Aubrey Serr
12 East Games

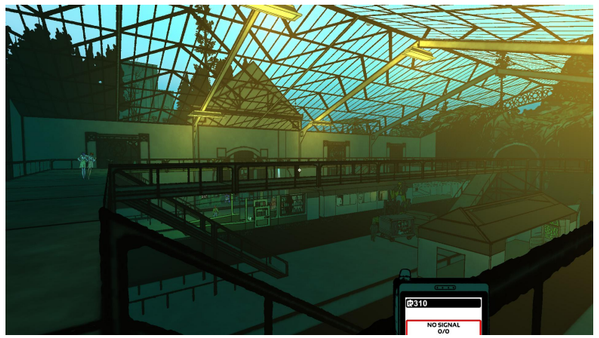
GAME DEVELOPERS CONFERENCE
MARCH 18–22, 2019 | #GDC19

Aubrey Serr - @AubreySerr

12 East Games







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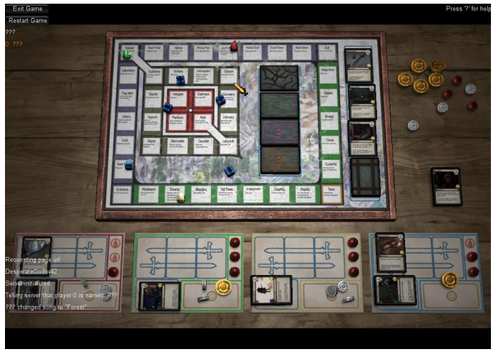
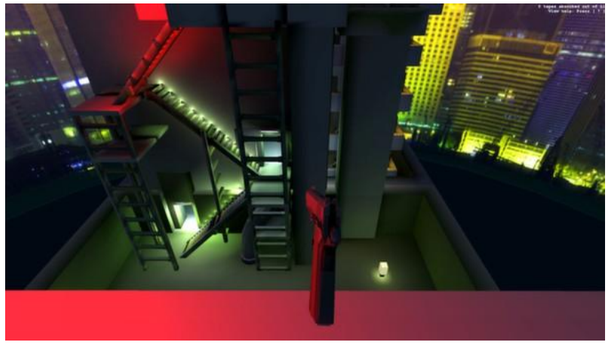
Wolfire





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Etc.

Main Sections

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-
-

Main Sections

- Define Radically Nonlinear Levels
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-

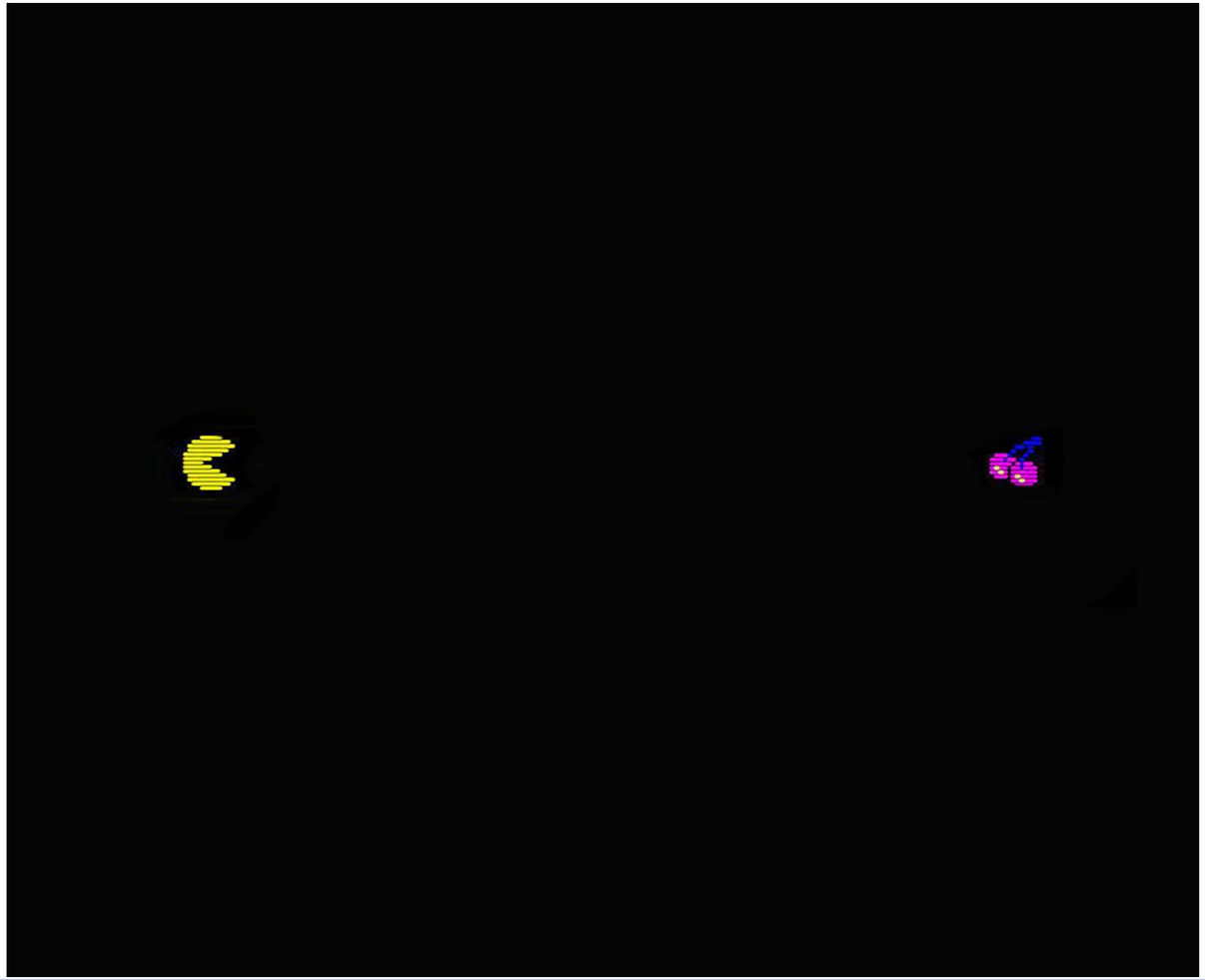
Main Sections

- Define Radically Nonlinear Levels
- Basics of how to build them
-

Main Sections

- Define Radically Nonlinear Levels
- Basics of how to build them
- How to fix issues that come up

Paths and Walls



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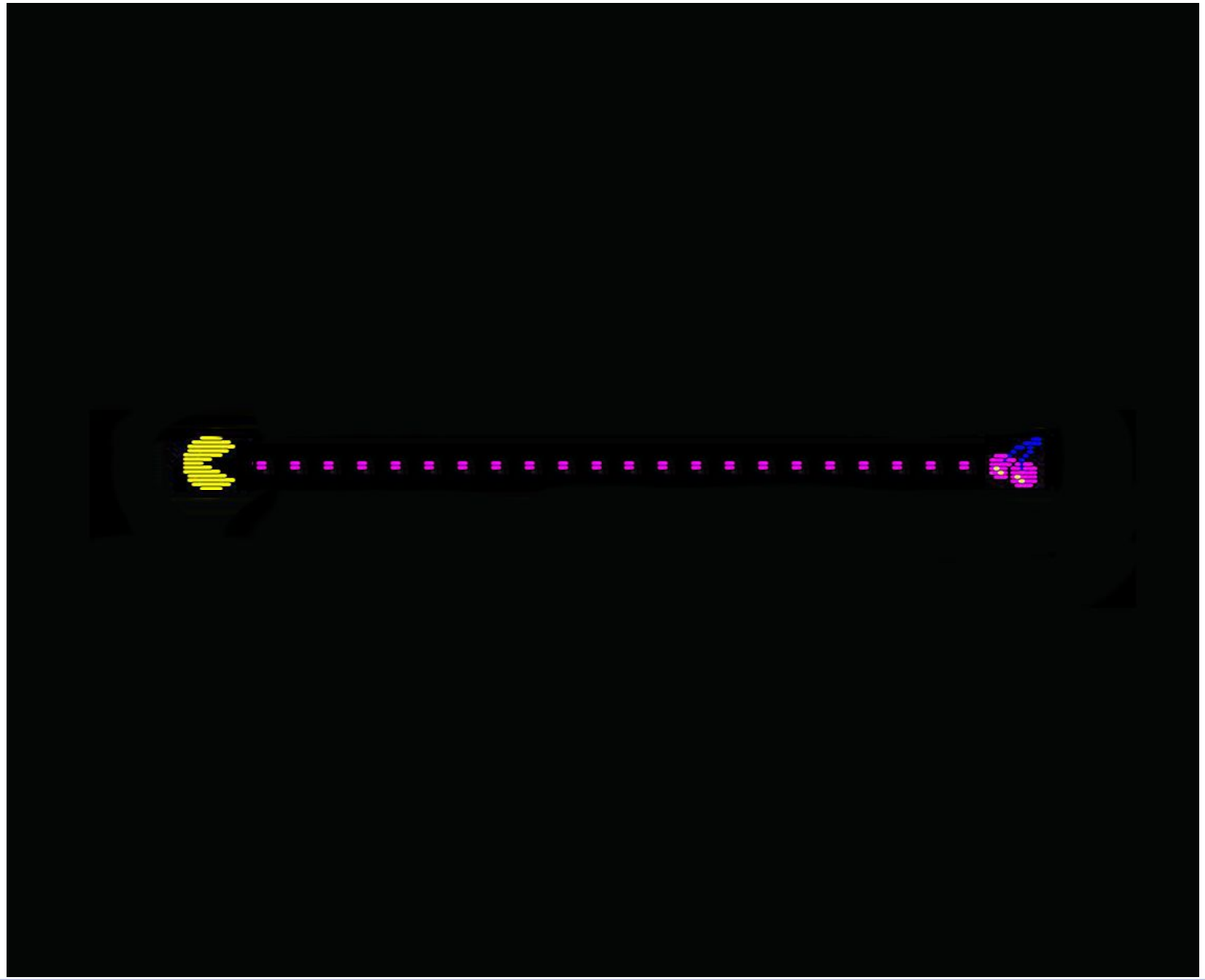

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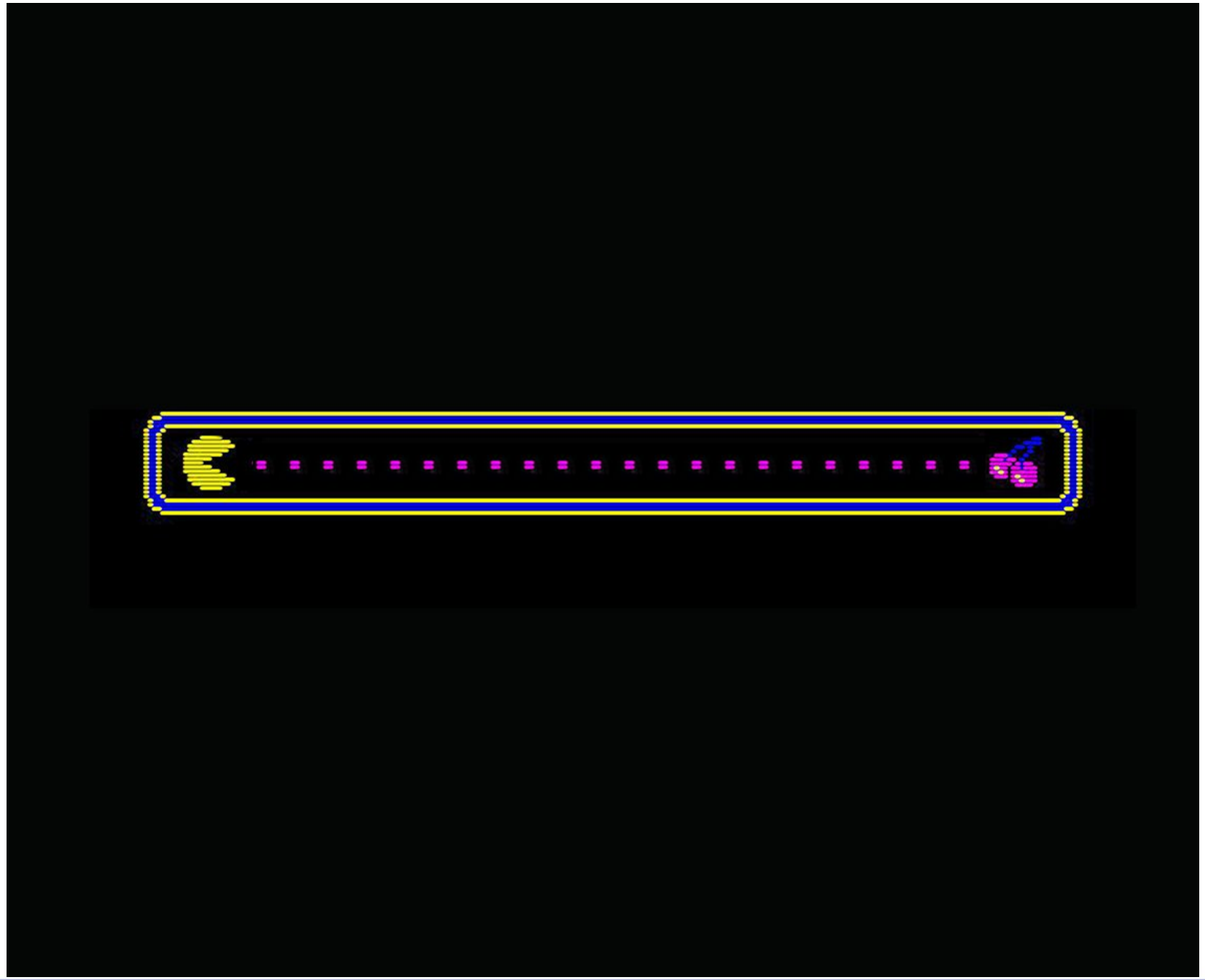

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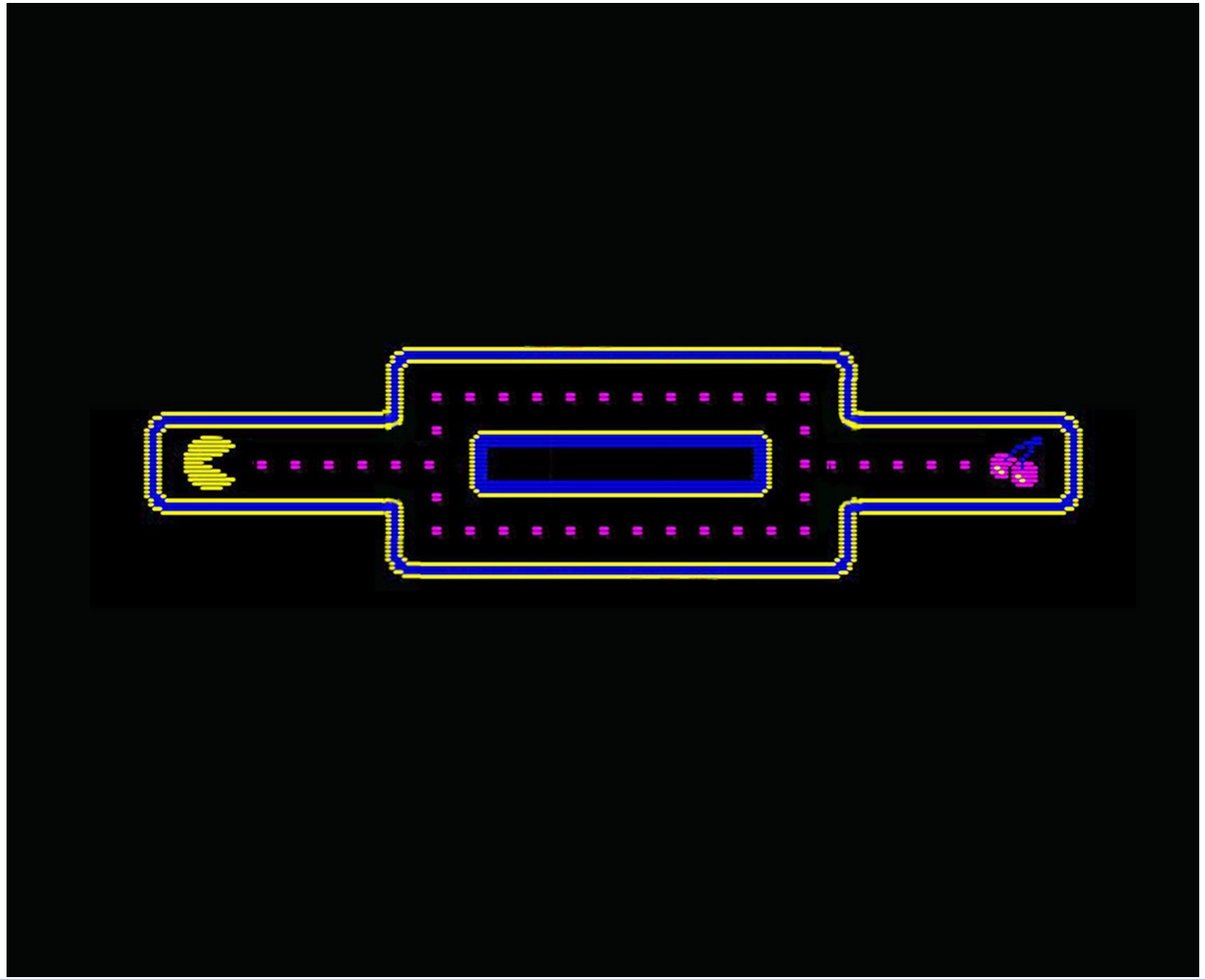

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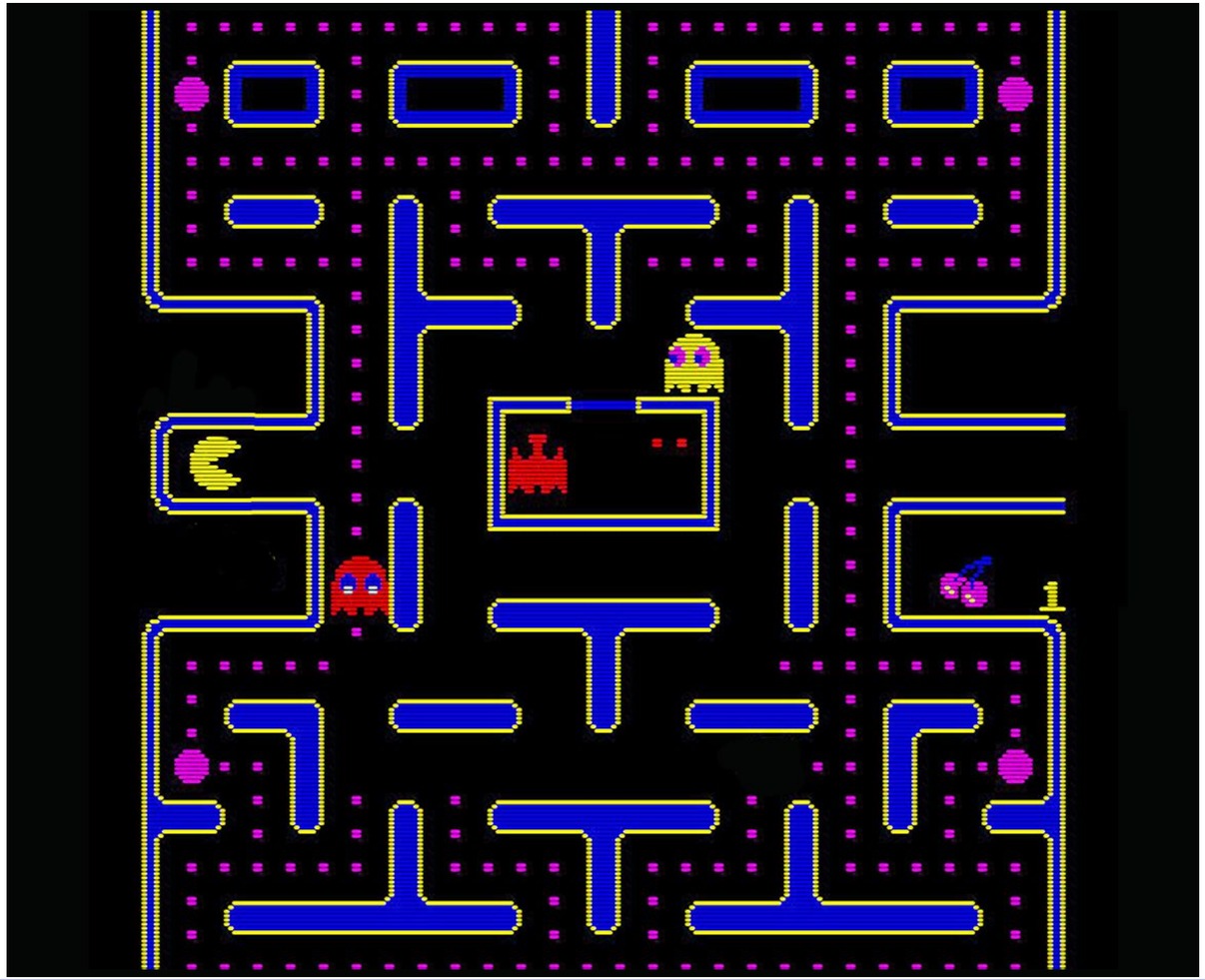
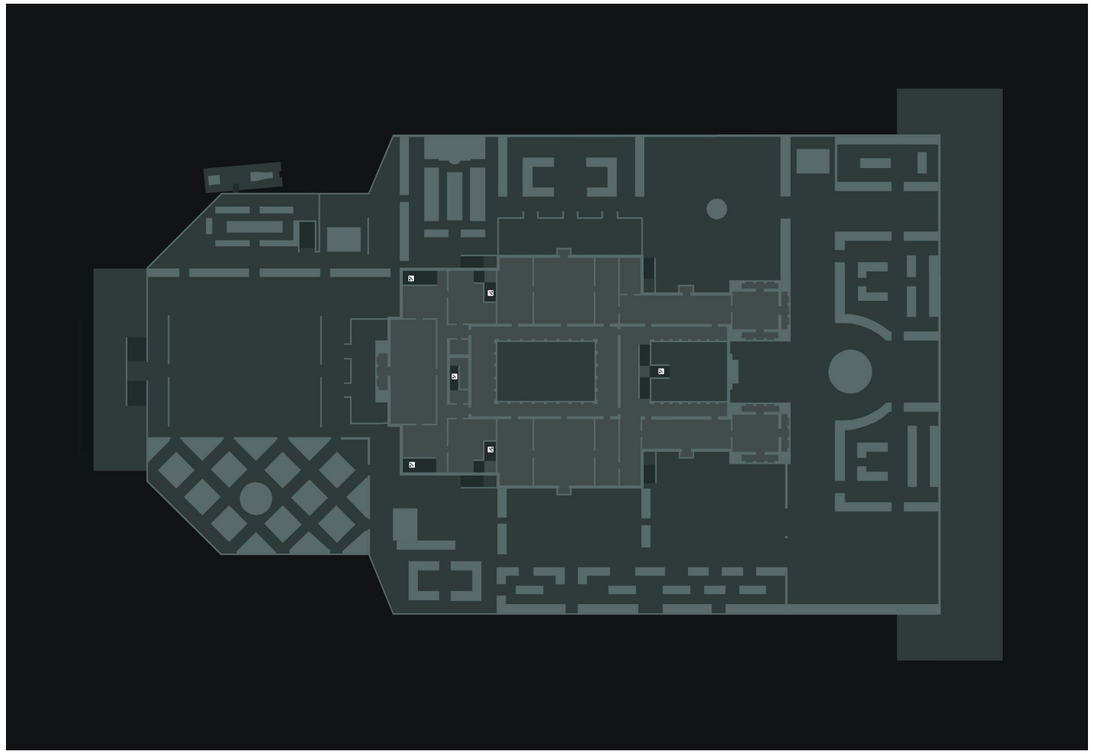


Nonlinear Sandbox



Lots of Examples…...

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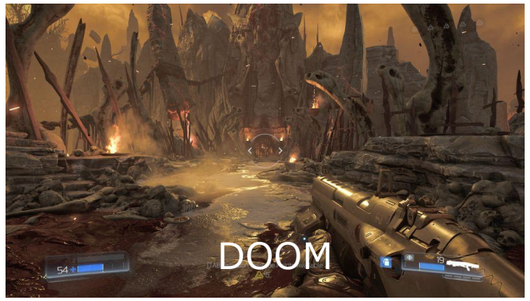

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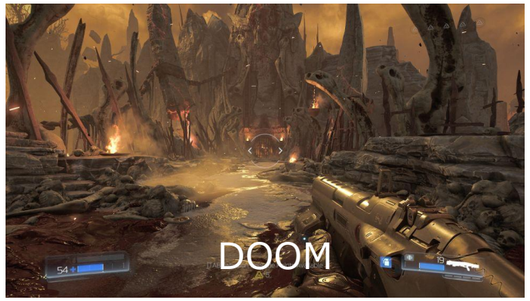
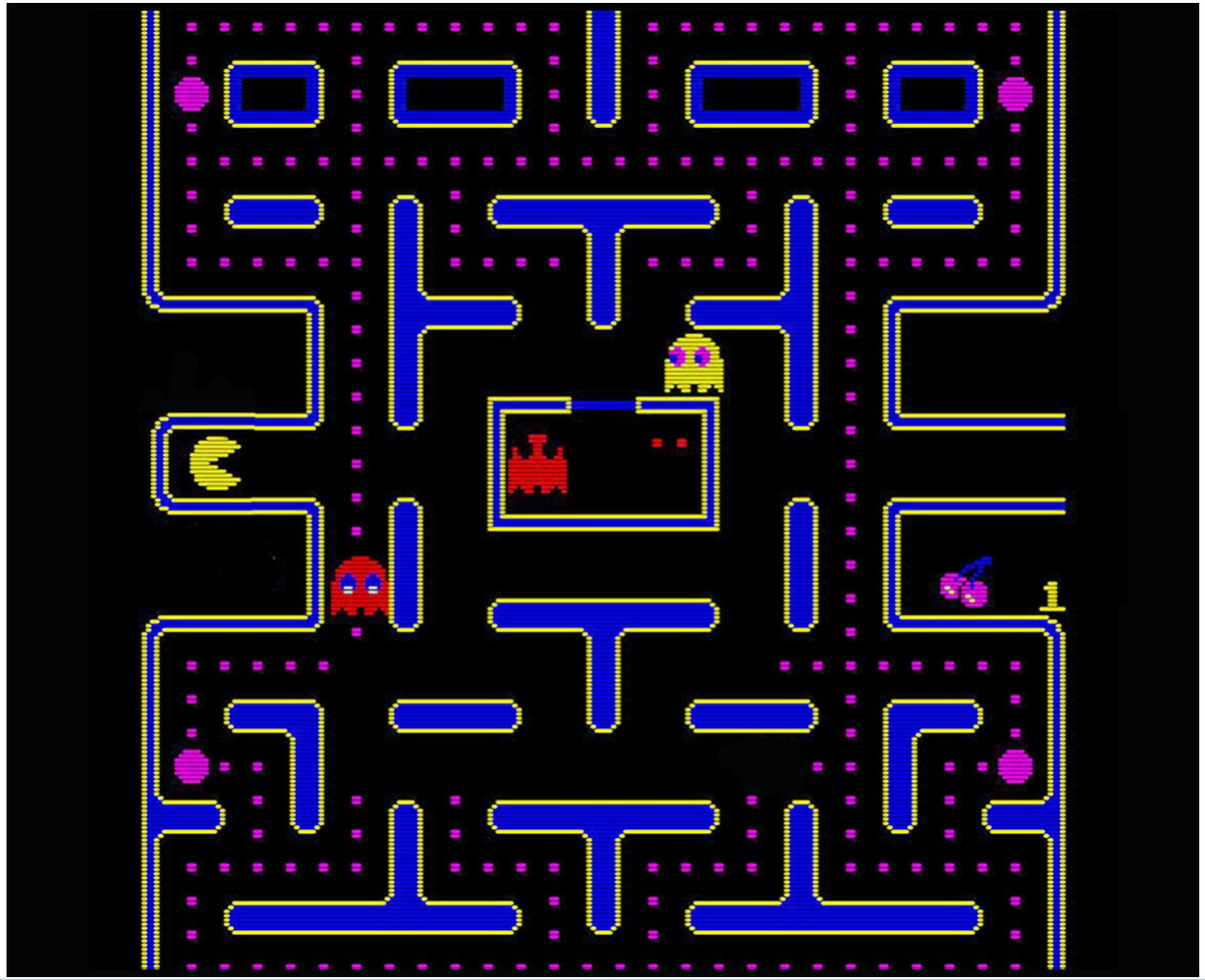


Are These a Distinct Type of Level?



JOURNEY TO 5 DISTINCT TIMES AND LOCATIONS
BATTLE HUNDREDS OF NPC ENEMIES ON-SCREEN AT ONCE
WIELD FUTURISTIC WEAPONS IN EPIC, HISTORICALLY-ACCURATE BATTLES
MATURE 17+
M
Blood
Strong Language
Violence
Valcon Games 15771 NE 80th St Ste. 104 Redmond, WA 98052
WARNING Read instruction manual for information about photosensitive seizures and other important safety and health information.
Microsoft
MADE IN USA
PROOF OF PURCHASE
XBOX 360
DARKEST OF DAYS
S64
707D4
XBOX 360
XBOX LIVE
DARKEST OF DAYS
MATURE 17+
M
ESRB
PHANTOM
VALCON

NINTENDO
ABCDEFGHIJKLMNOPQRS CL END LP
1

Our Own Engine and Tools

THIS IS FINE.

A-OK

“The gameplay never follows up on the intriguing premise, wasting its memorable final levels by forcing you to crawl through a dozen dull ones before you get to them.”

4.5/10 Gamespot

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“This first-person shooter from 8monkey Labs fails on nearly all fronts.”

3.6/10 IGN

“Darkest of Days is the worst first-person shooter of this generation.”

“This game is stupid. Straight-up stupid.”

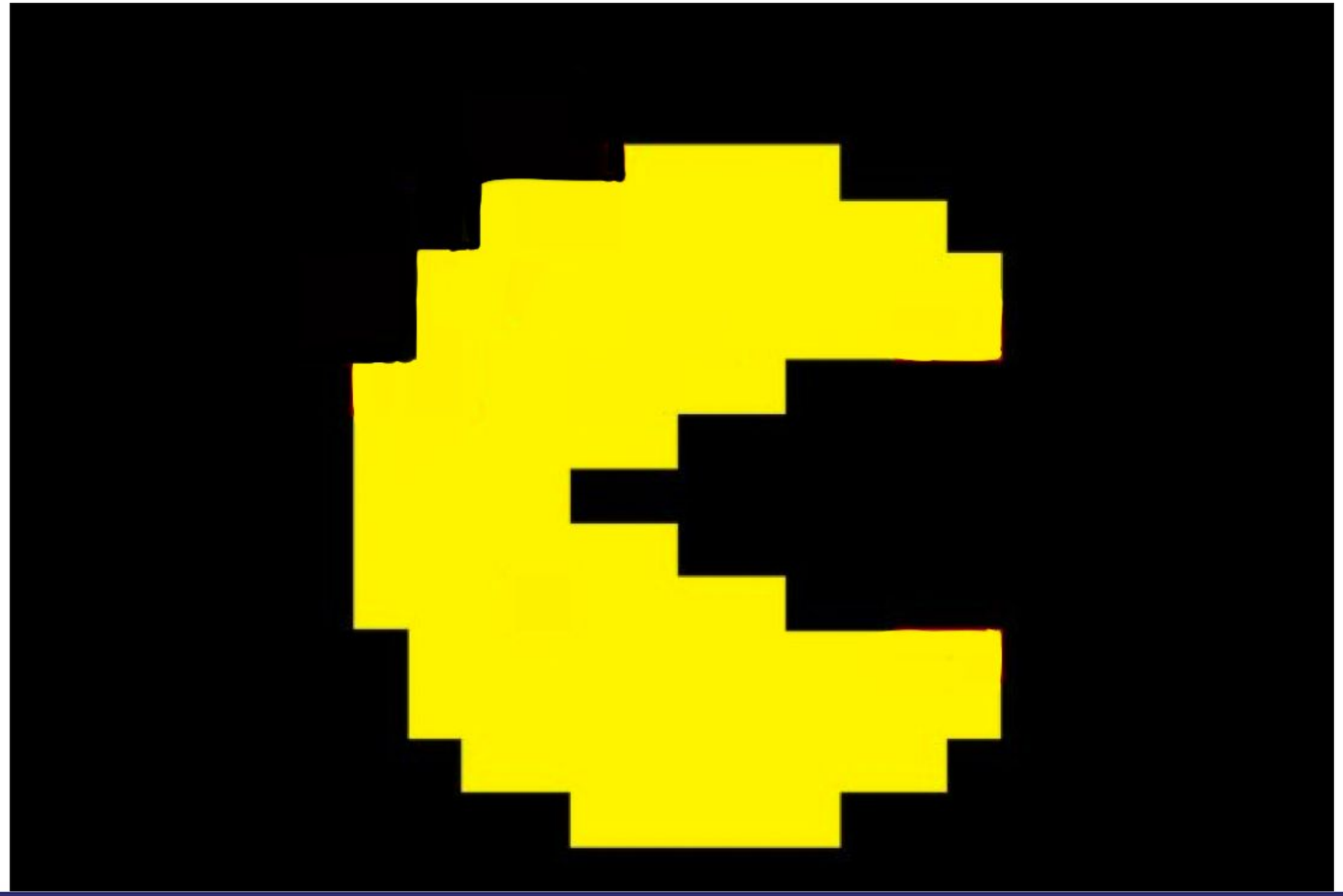
1/10 Destructoid

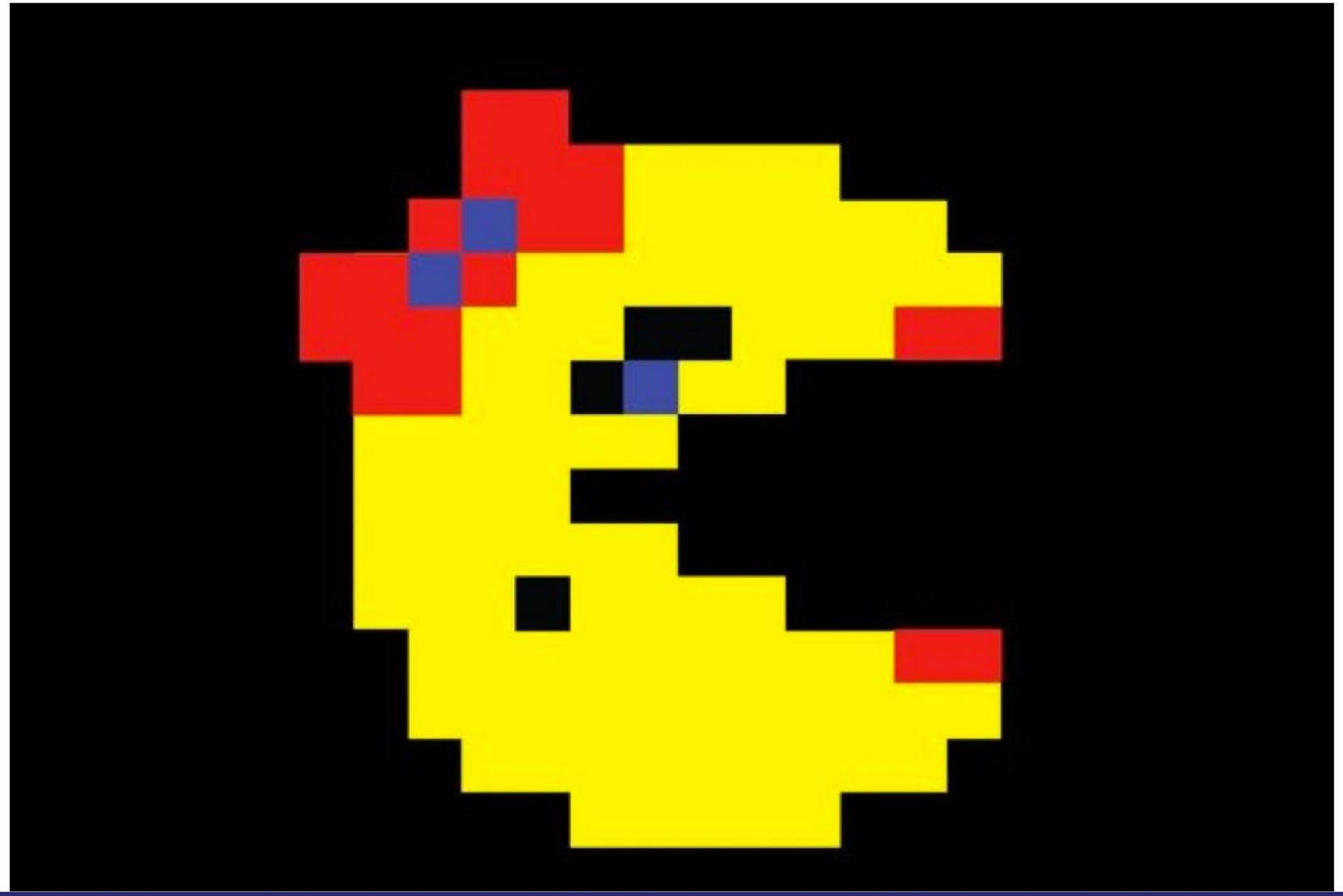
The Problem

vs.

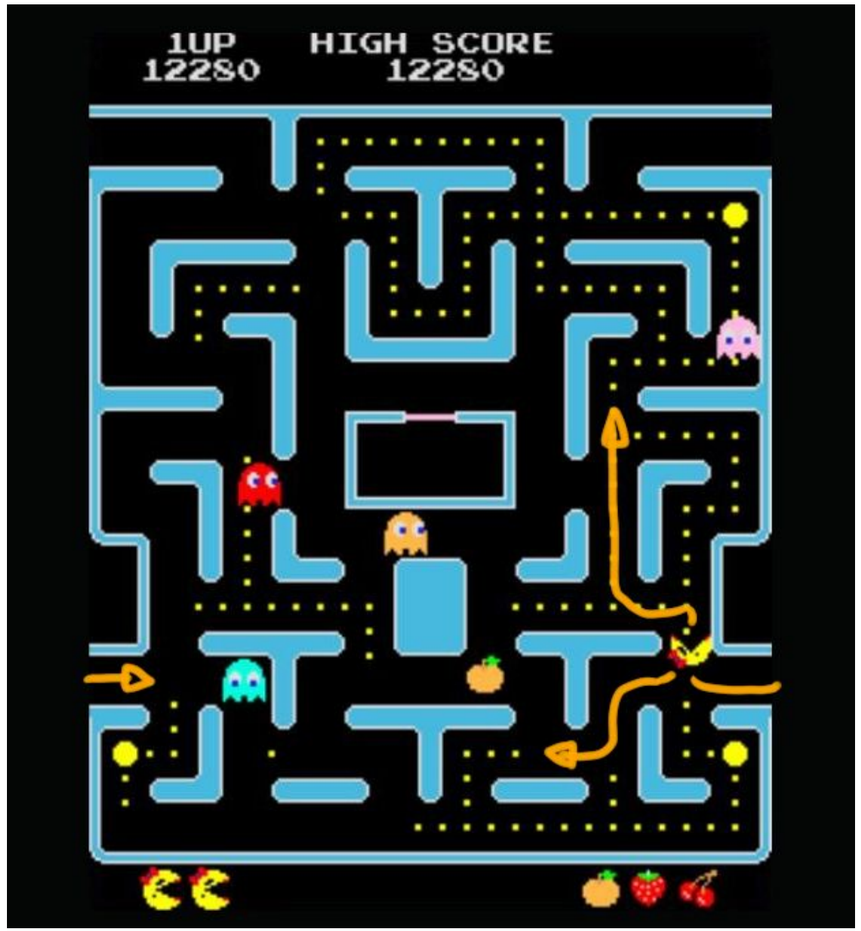
Section 1

What is a Radically Nonlinear Level?

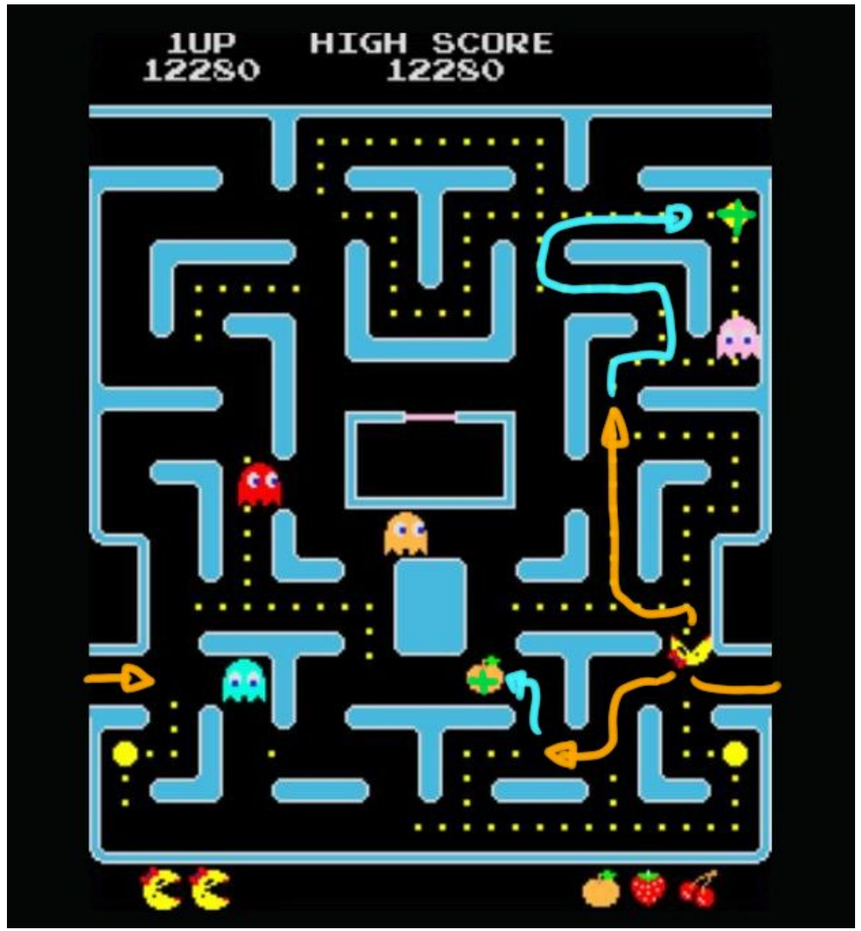




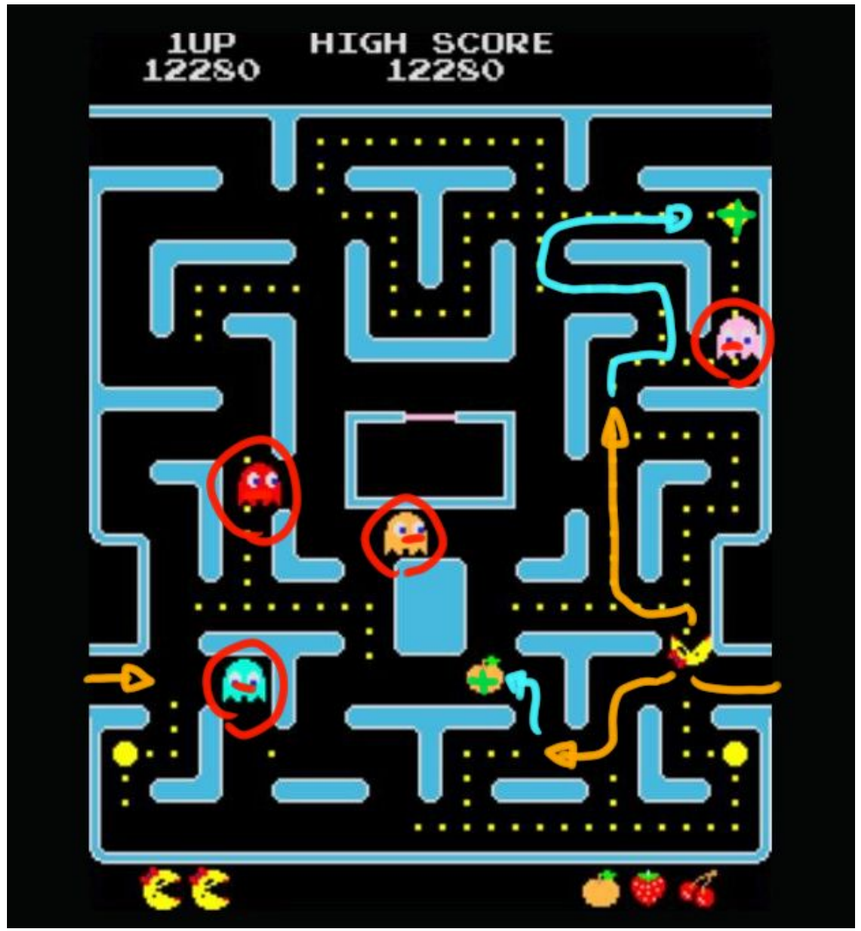
Small Immediate Choices



Bigger Choices



Risks



Ms. Pac-Man Level Notes

- Not too big or too small
-
-
-

Ms. Pac-Man Level Notes

- Not too big or too small
- Easy to understand
-
-

Ms. Pac-Man Level Notes

- Not too big or too small
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- No exit
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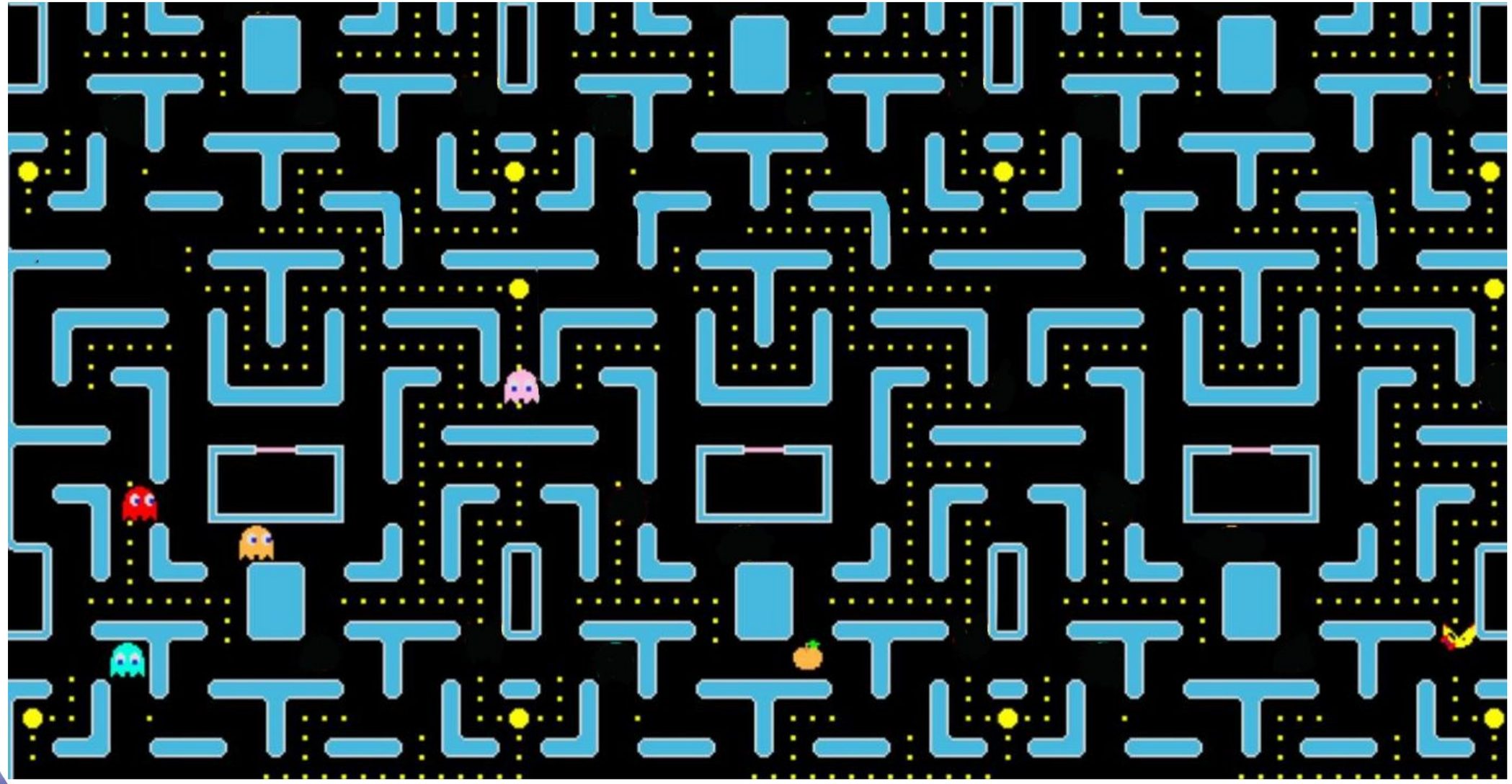
Ms. Pac-Man Level Notes

- Not too big or too small
- Easy to understand
- No exit
- Dynamic pacing

Open World?



Multiplayer Bot Match?

- Yes except you don’t need:
  -
  -
  -
  -

Multiplayer Bot Match?

- Yes except you don’t need:
  - Symmetrical balance
  - Lag tolerance
  - Limited physics
  - Etc.

MDA Framework

- Mechanics: rules, data
- Dynamics: runtime behavior
- Aesthetics: emotional connection

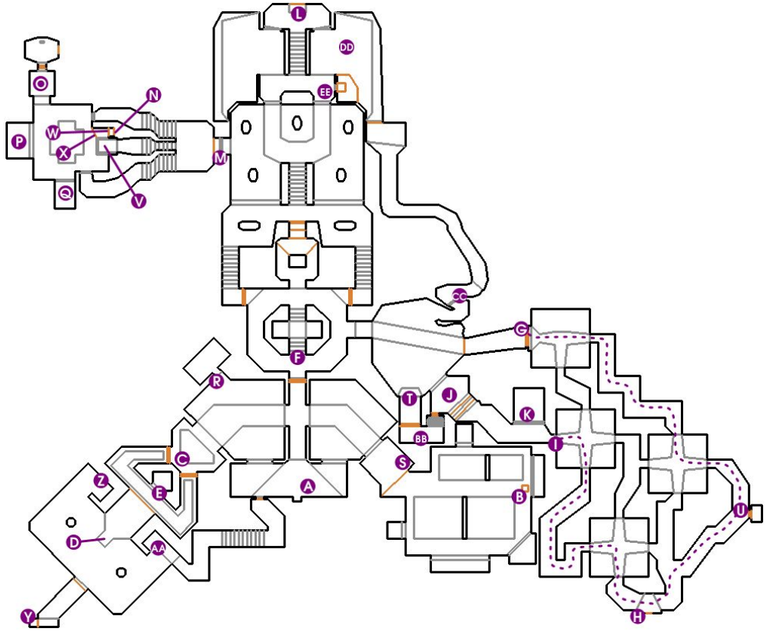
1982

DOOM 2016

MISSION
SHUT DOWN THE ARGENT TOWER
Disable the Argent filters 0 / 3
3
2
CHALLENGES
Walk the Path
Interact with a Rune Trial Stone.
Bird's Eye View
Acquire the AutoMap for the Argent Facility.
To Be Knighted
Perform 2 "Death from Above" Glory Kills on Hell Knights.
EXPLORATION
SECRETS
ELITE GUARDS
FIELD DRONES
ARGENT CELLS
RUNE TRIALS
Objective
Armor
AutoMap
Collectible
Data Log
Echo
Health Station
[ESC] CLOSE
[E] HIDE TEXT
[C] 2D / 3D
[SPACE] RECENTER
ZOOM
CYCLE OBJECTIVES

DOOM 2016

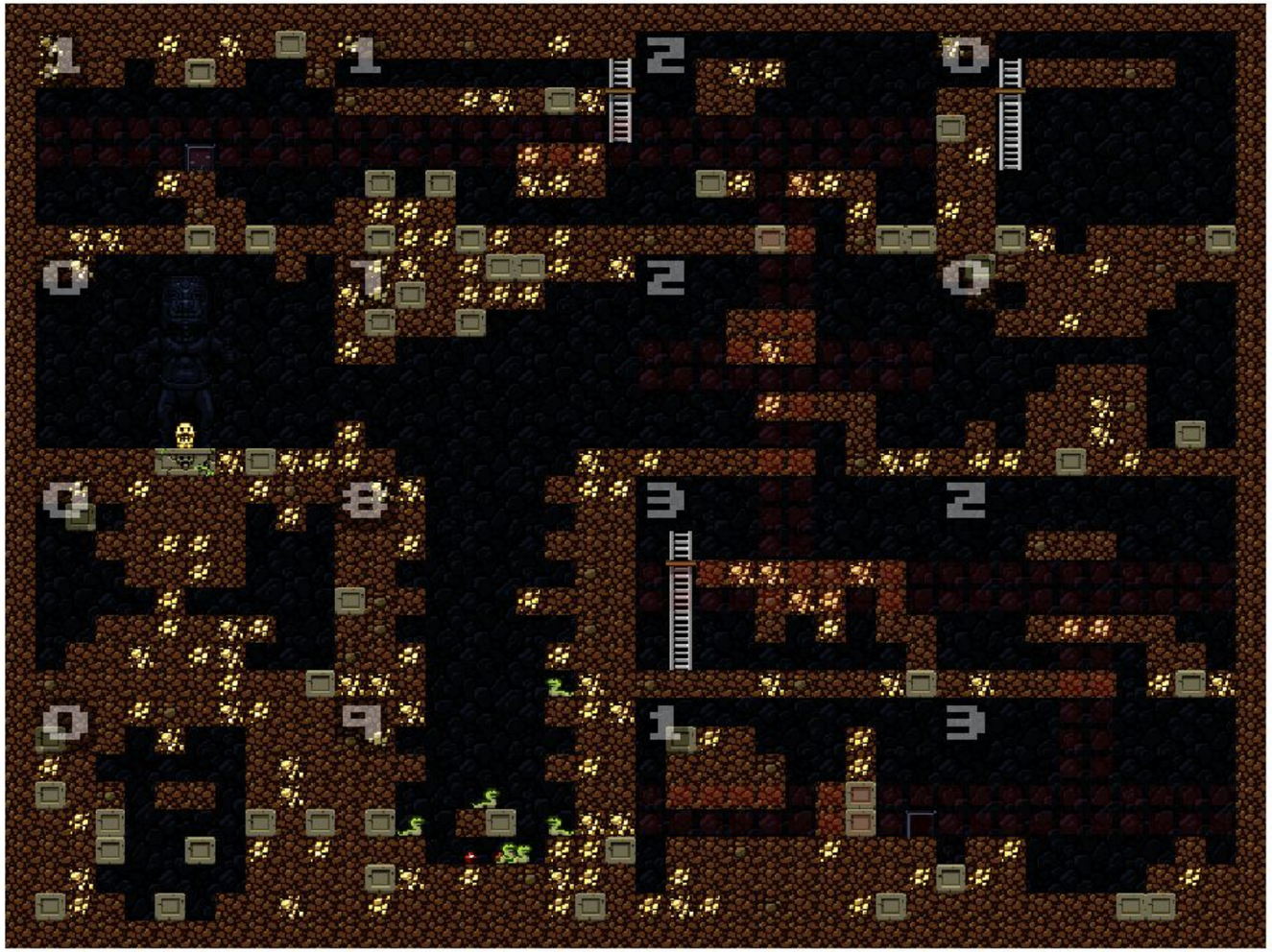
DOOM 1993



Unit Types
Scrap
17/95
Pilots
06/45
Defense
Defense
Utility
Nav Beacons
Recycler
Factory
Armory
Constructor
Satellite
No Action
No Action
SP-Stabber
SP-Stabber
Pop Gun
Proxx Mine

KONAMI

SLP.40 PISTOL
Enter the Theater
SLP.40 PISTOL 11/0



The level is made of 16 rooms in a 4x4 grid. There are 4 different basic room types:

- 0: a side room that is not on the solution path
- 1: a room that is guaranteed to have a left exit and a right exit
- 2: a room that is guaranteed to have exits on the left, right, and bottom. If there's another "2" room above it, then it also is guaranteed a top exit
- 3: a room that is guaranteed to have exists on the left, right, and top

Why are Radically Nonlinear Levels Rad?

-
-
-
-
-
-

Why are Radically Nonlinear Levels Rad?

- Deeper gameplay
-
-
-
-
-

because of the dynamic gameplay, Tenchu had items like a Ninja Dog, poison rice, and a decoy whistle

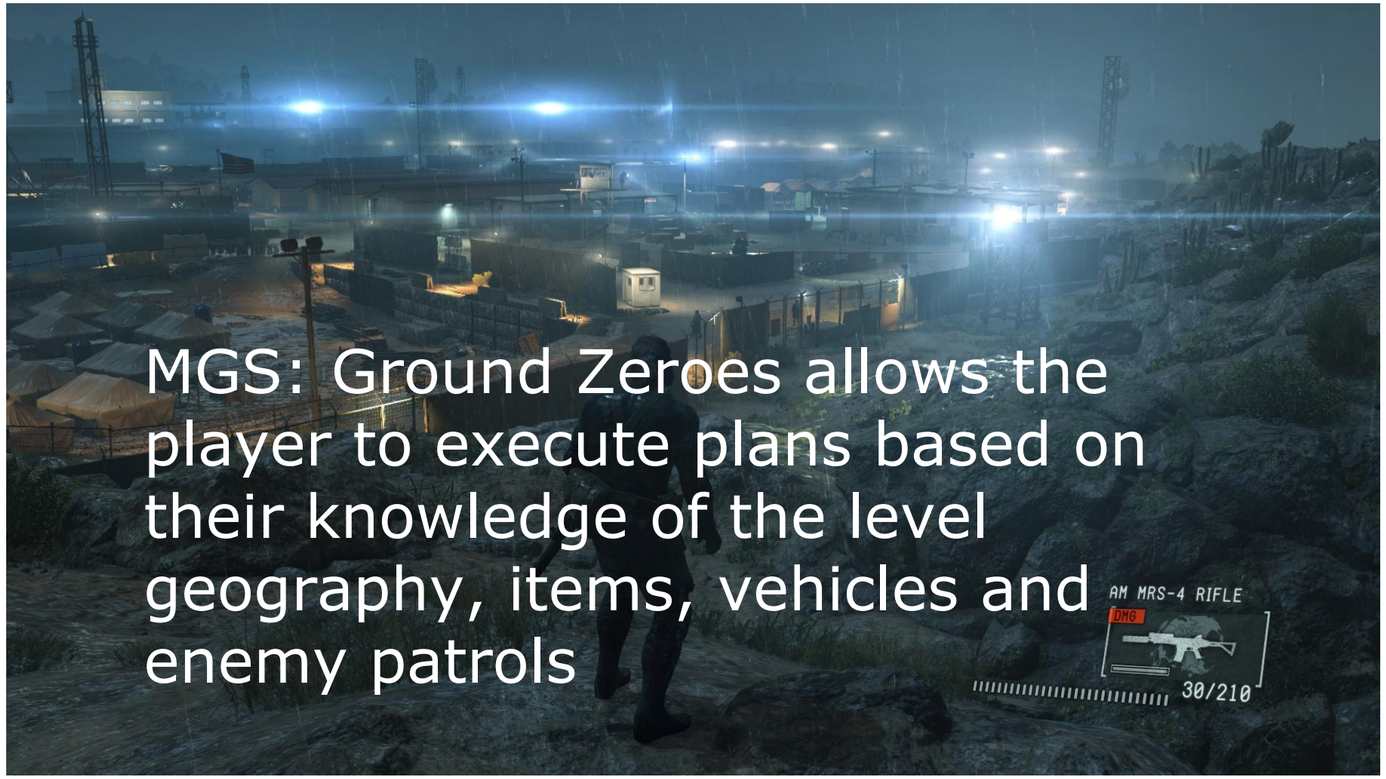
FromSoft's next game Sekiro was inspired by Tenchu

Why are Radically Nonlinear Levels Rad?

- Deeper gameplay
- More choices
-
-
-
-

Why are Radically Nonlinear Levels Rad?

- Deeper gameplay
- More choices
- Map knowledge
-
-
-



MGS: Ground Zeroes allows the player to execute plans based on their knowledge of the level geography, items, vehicles and enemy patrols

Why are Radically Nonlinear Levels Rad?

- Deeper gameplay
- More choices
- Map knowledge
- Destroy anything an option
-
-

The Red Faction series lets you blast your own path through obstacles

Why are Radically Nonlinear Levels Rad?

- Deeper gameplay
- More choices
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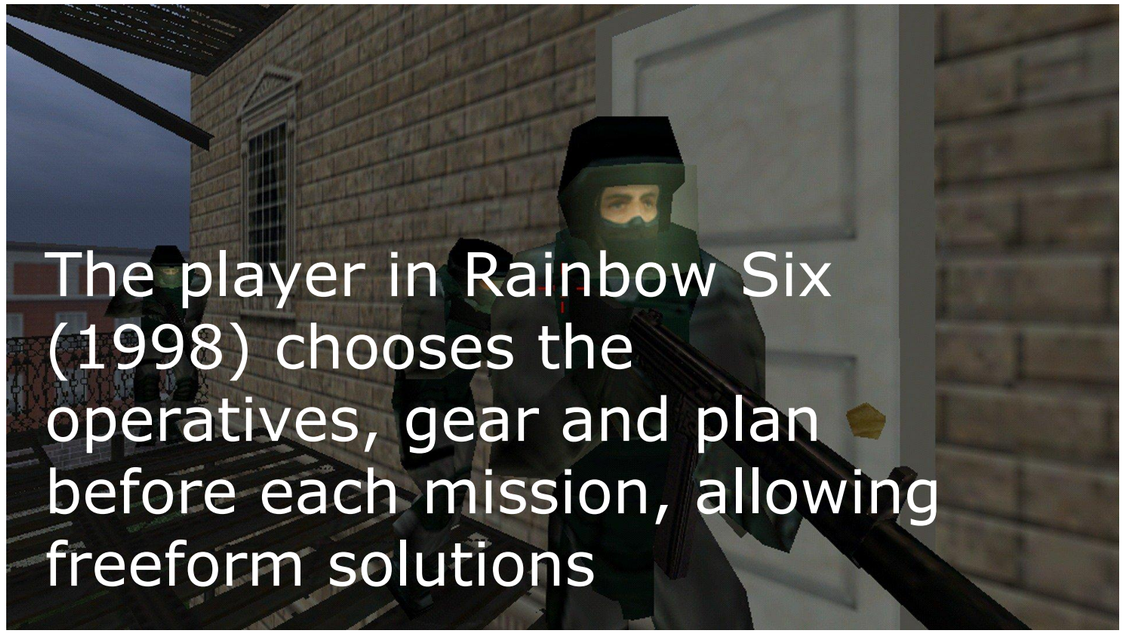
Why are Radically Nonlinear Levels Rad?

- Deeper gameplay
- More choices
- Map knowledge
- Destroy anything an option
- More realistic
- Replayability

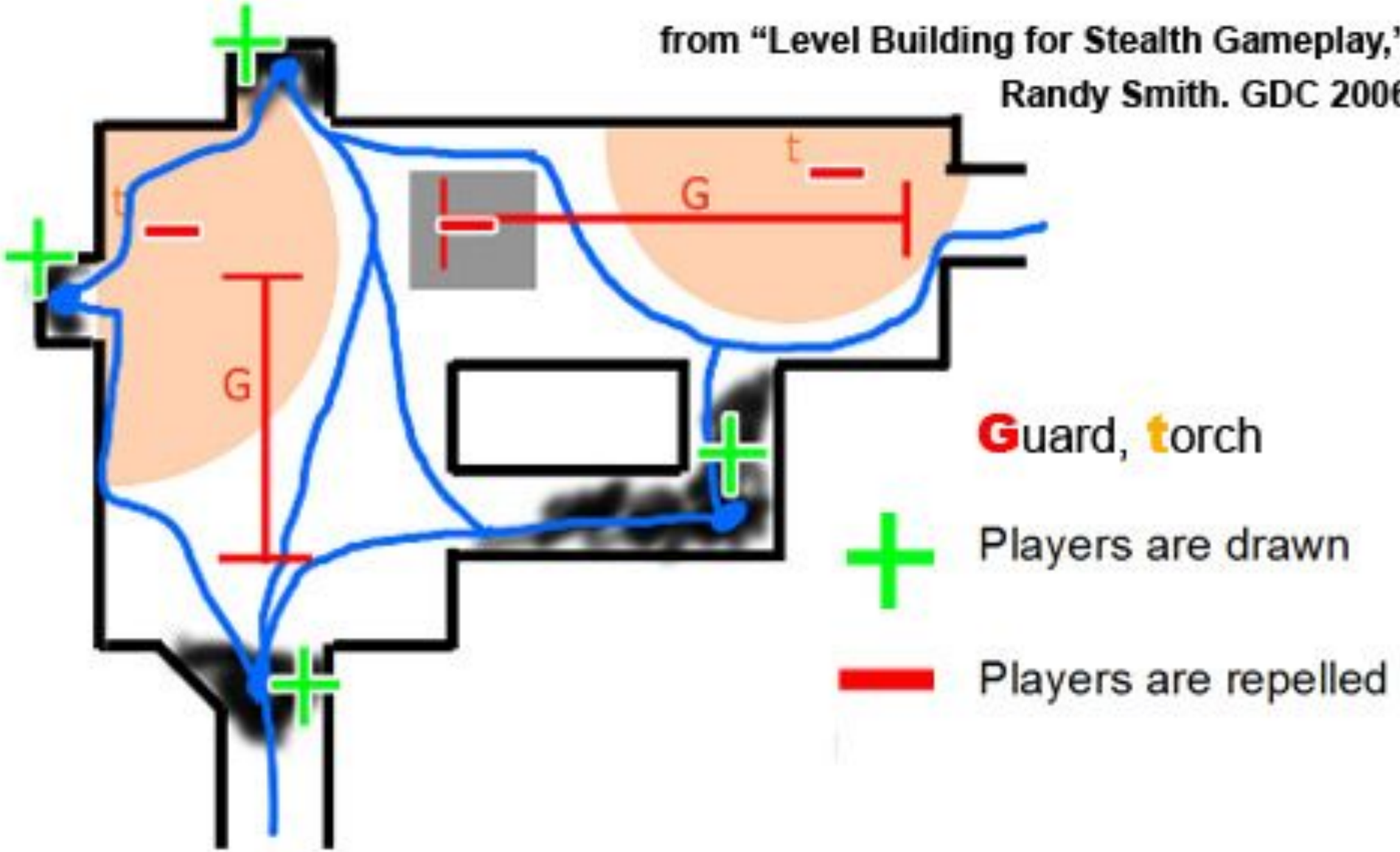


The player in Rainbow Six (1998) chooses the operatives, gear and plan before each mission, allowing freeform solutions

Section 2

How do you build a Nonlinear Level?

from "Level Building for Stealth Gameplay,"
Randy Smith. GDC 2006.



Layout Symbols

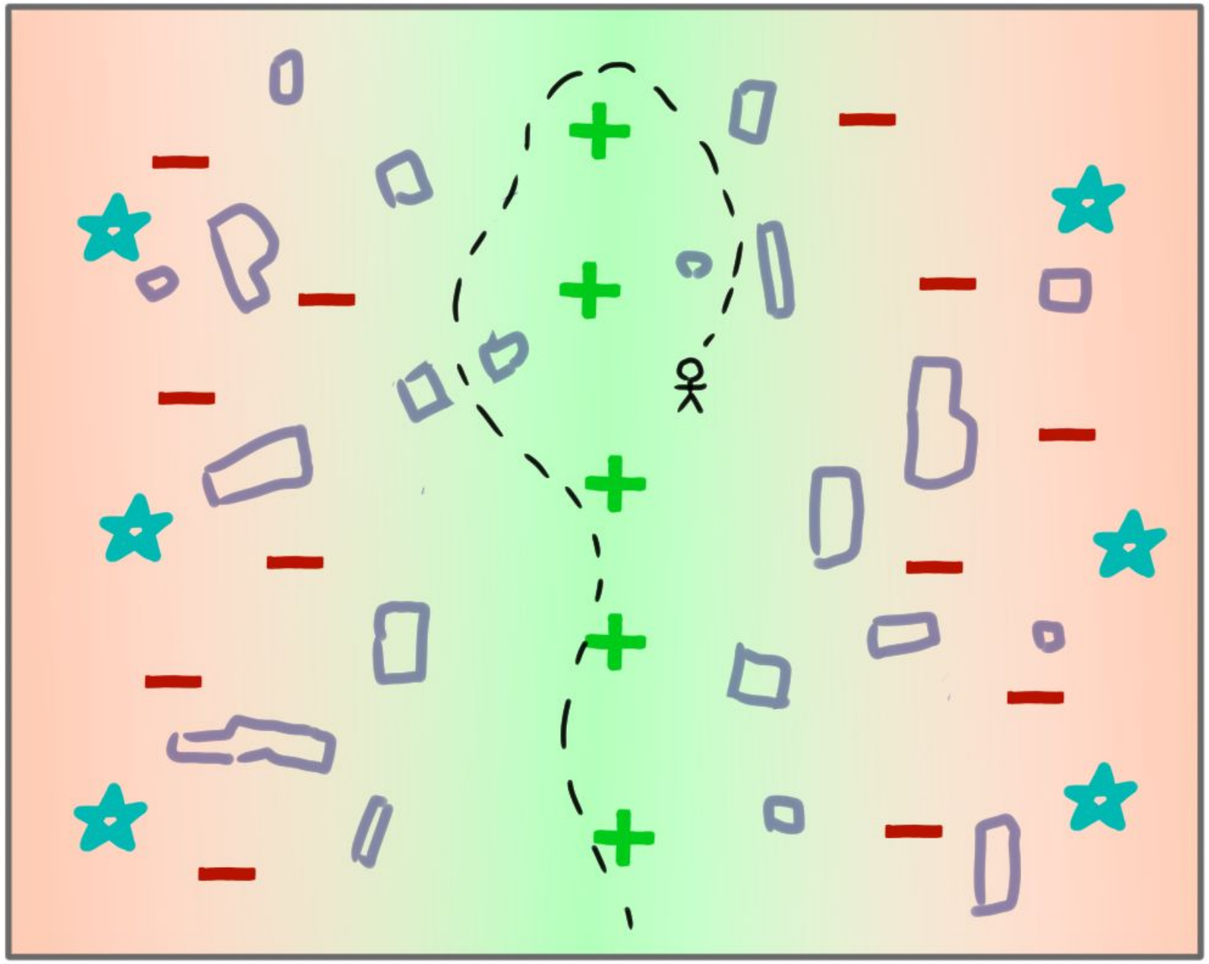
Enemy/Risk

Reward/Safety

Walls

Objective

Symmetrical Layout



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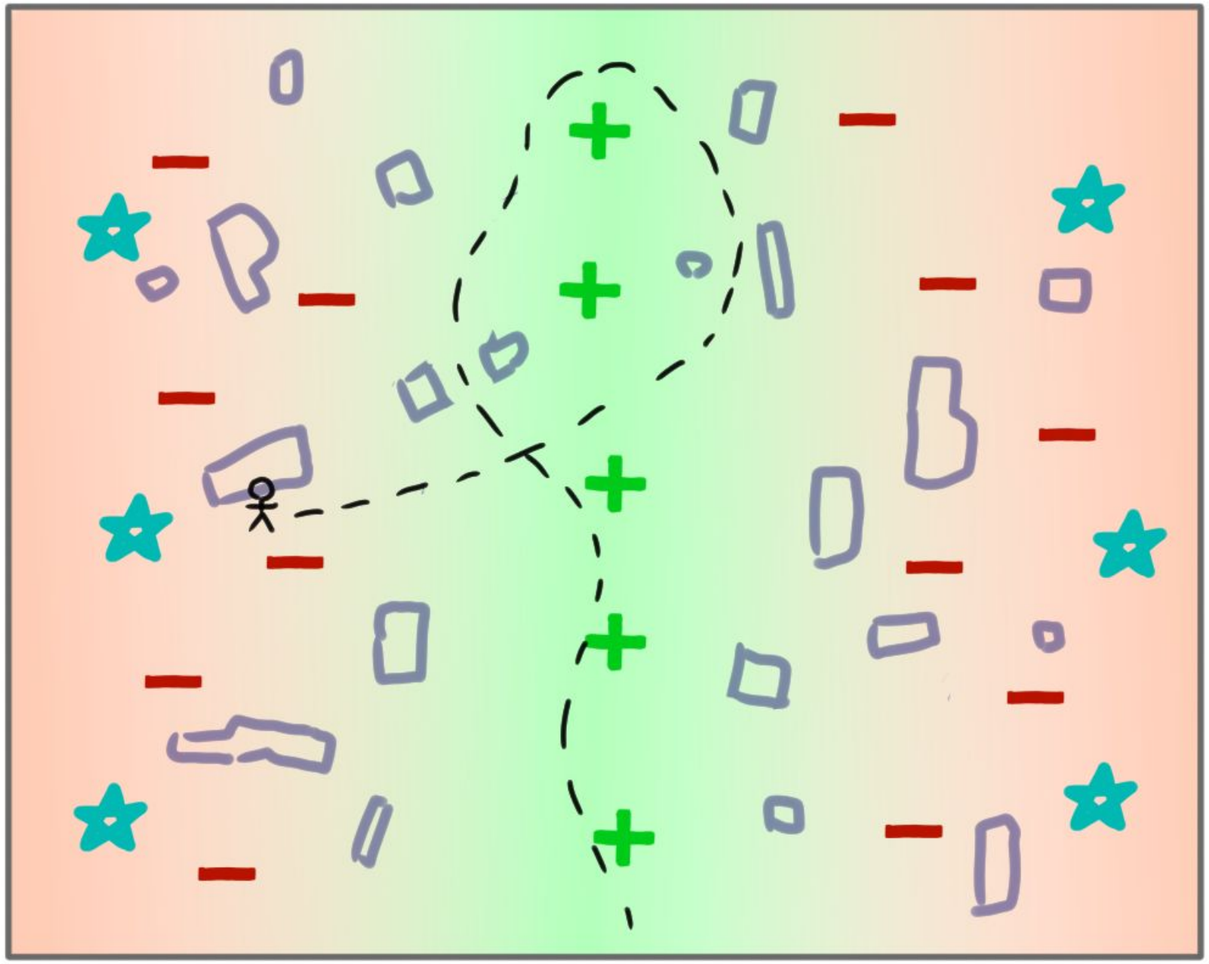

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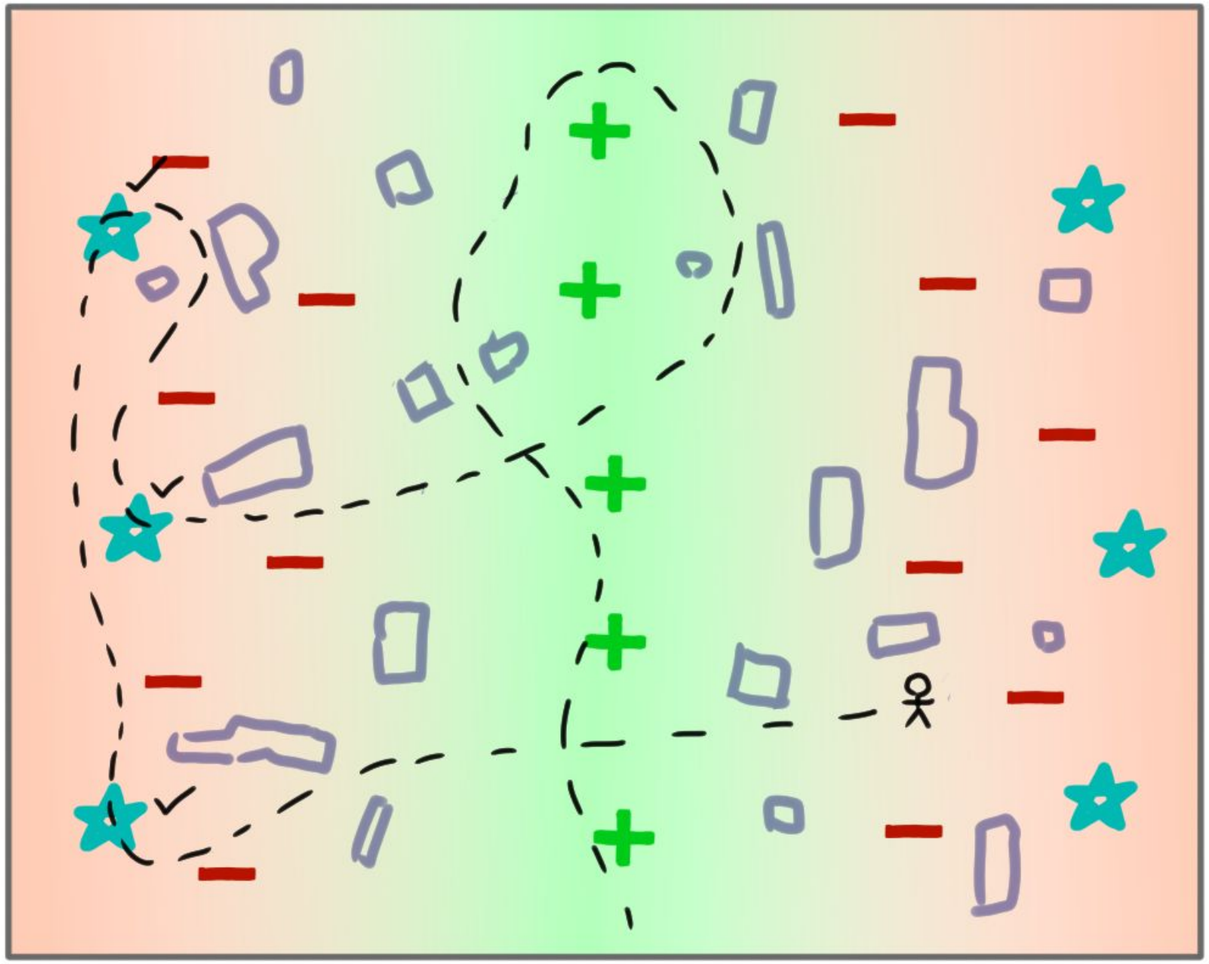
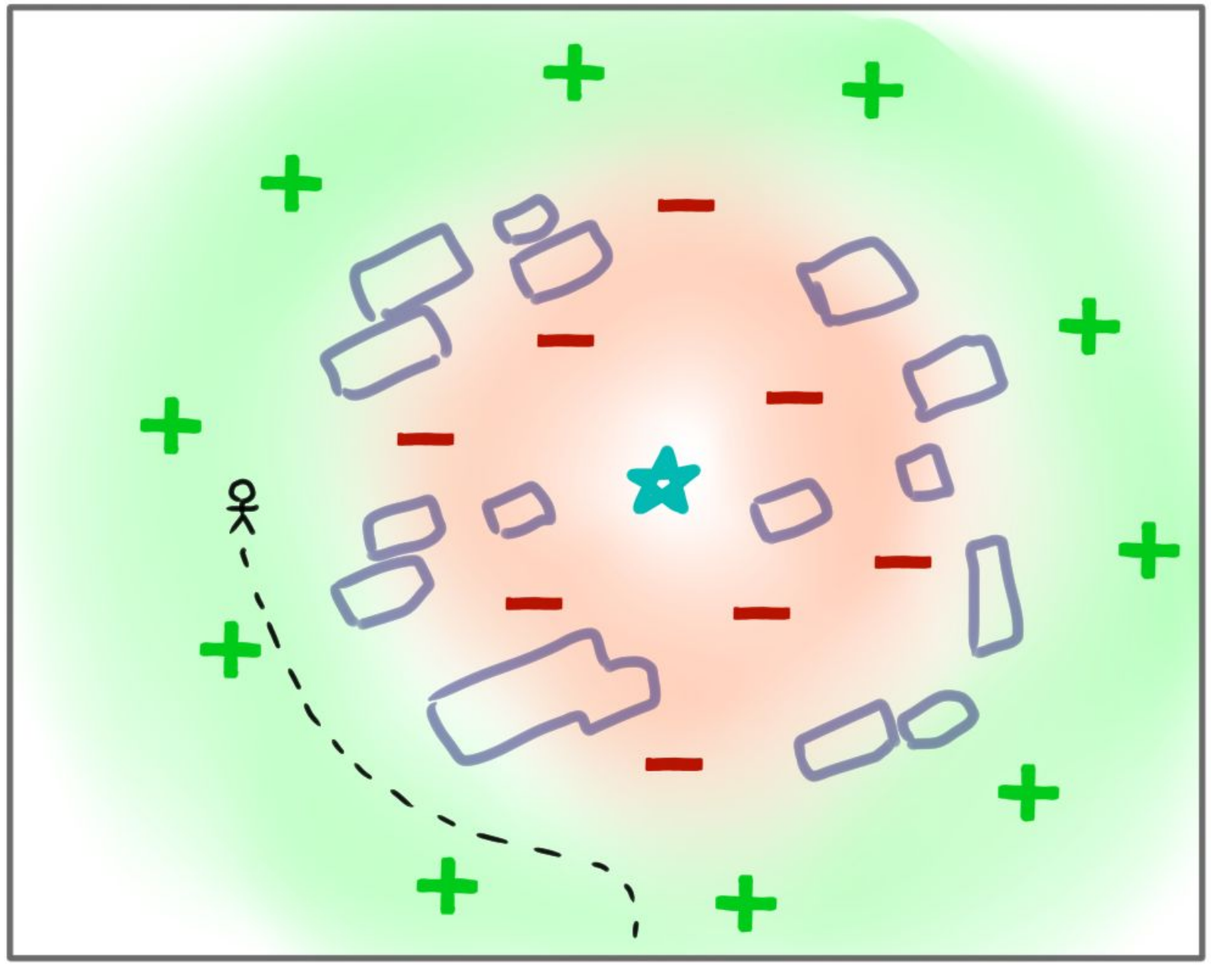


Concentric Layout



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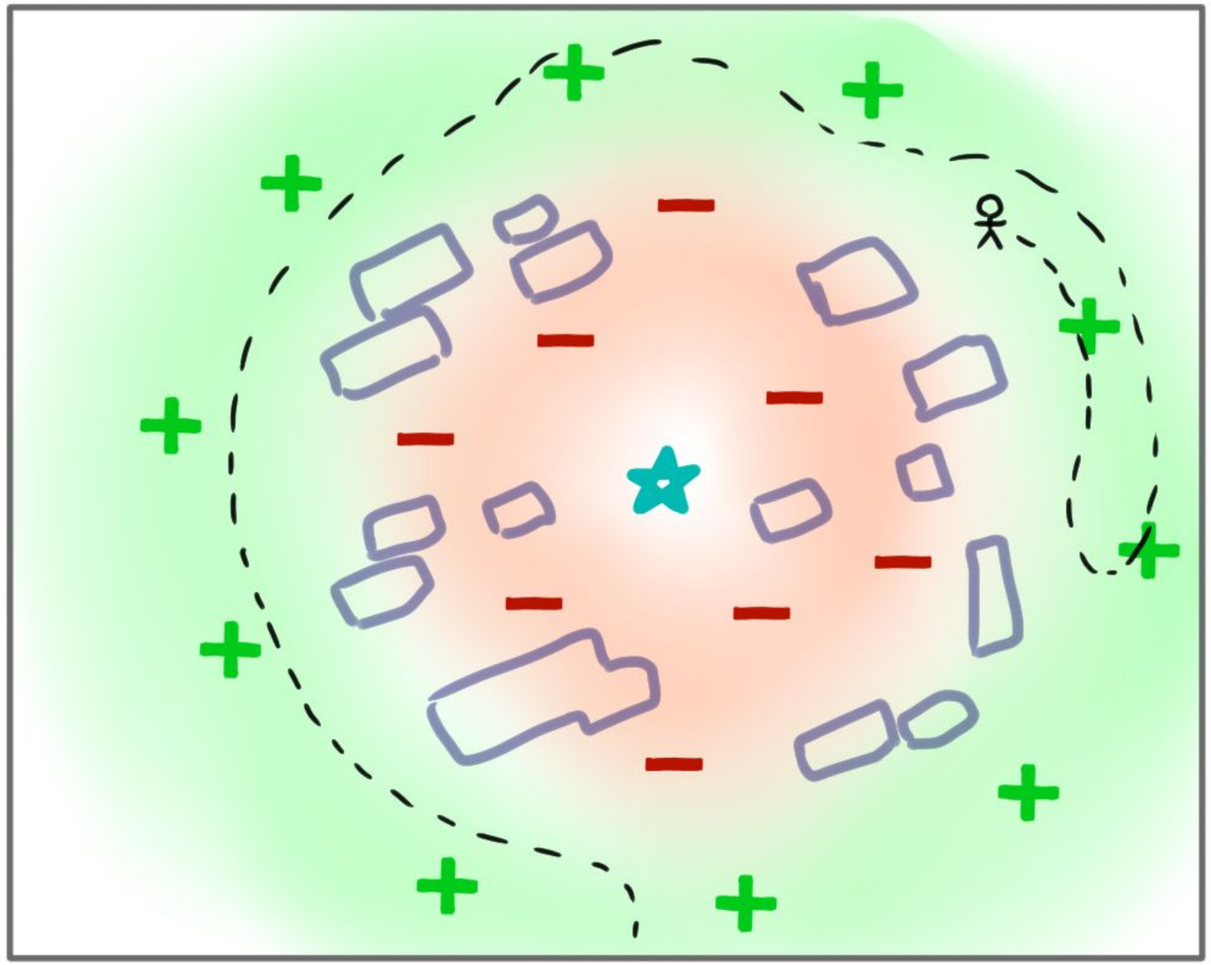

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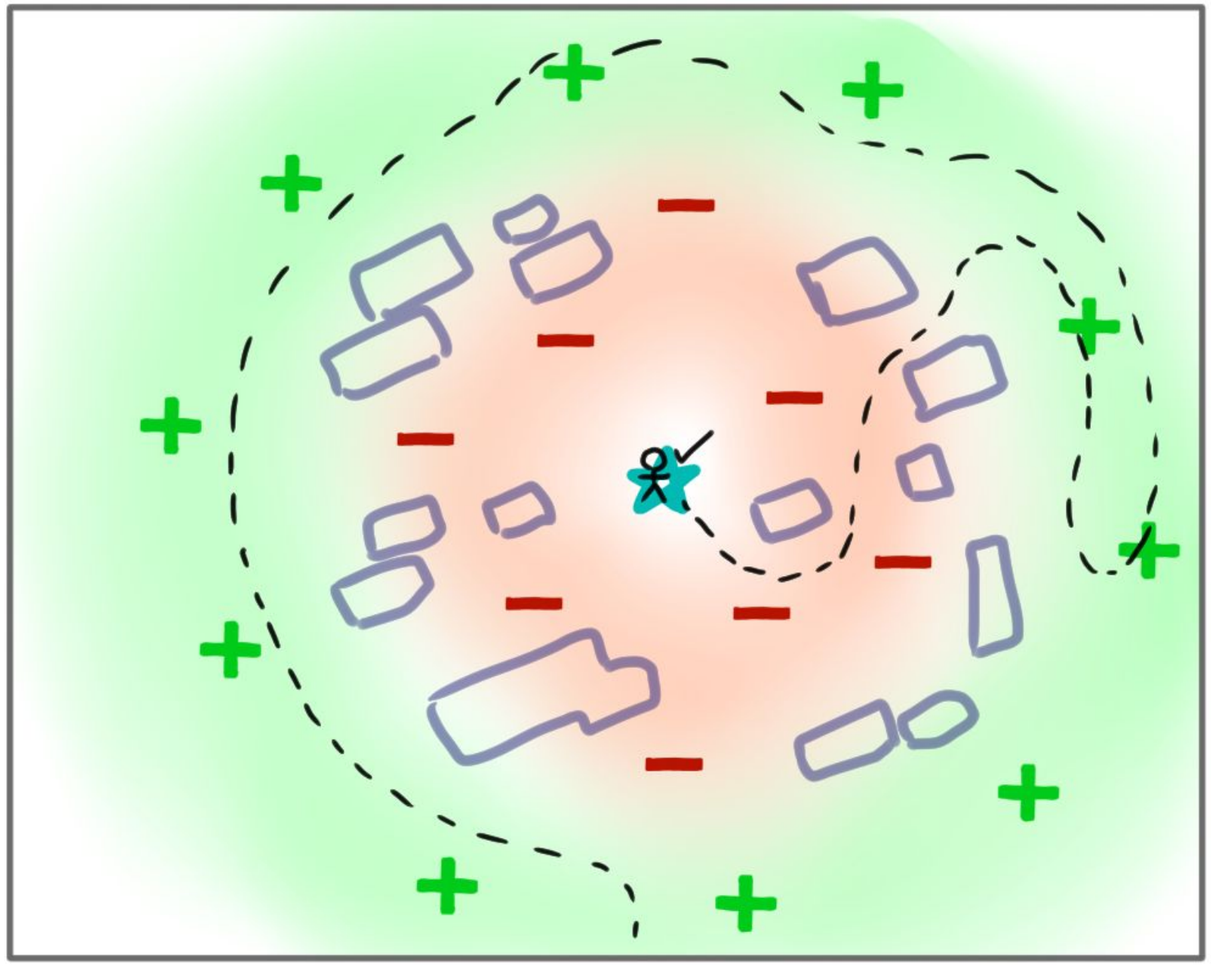
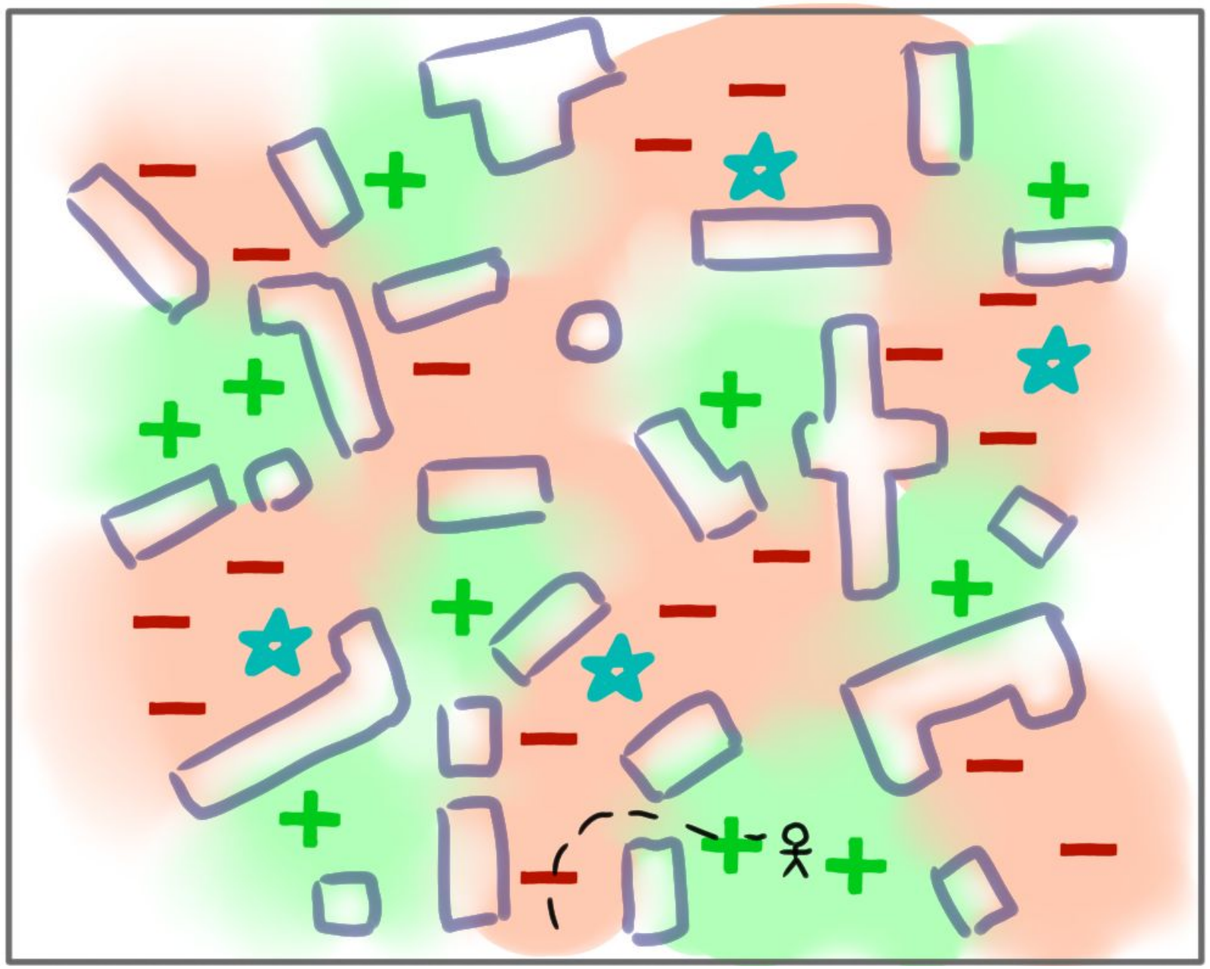


Node Layout



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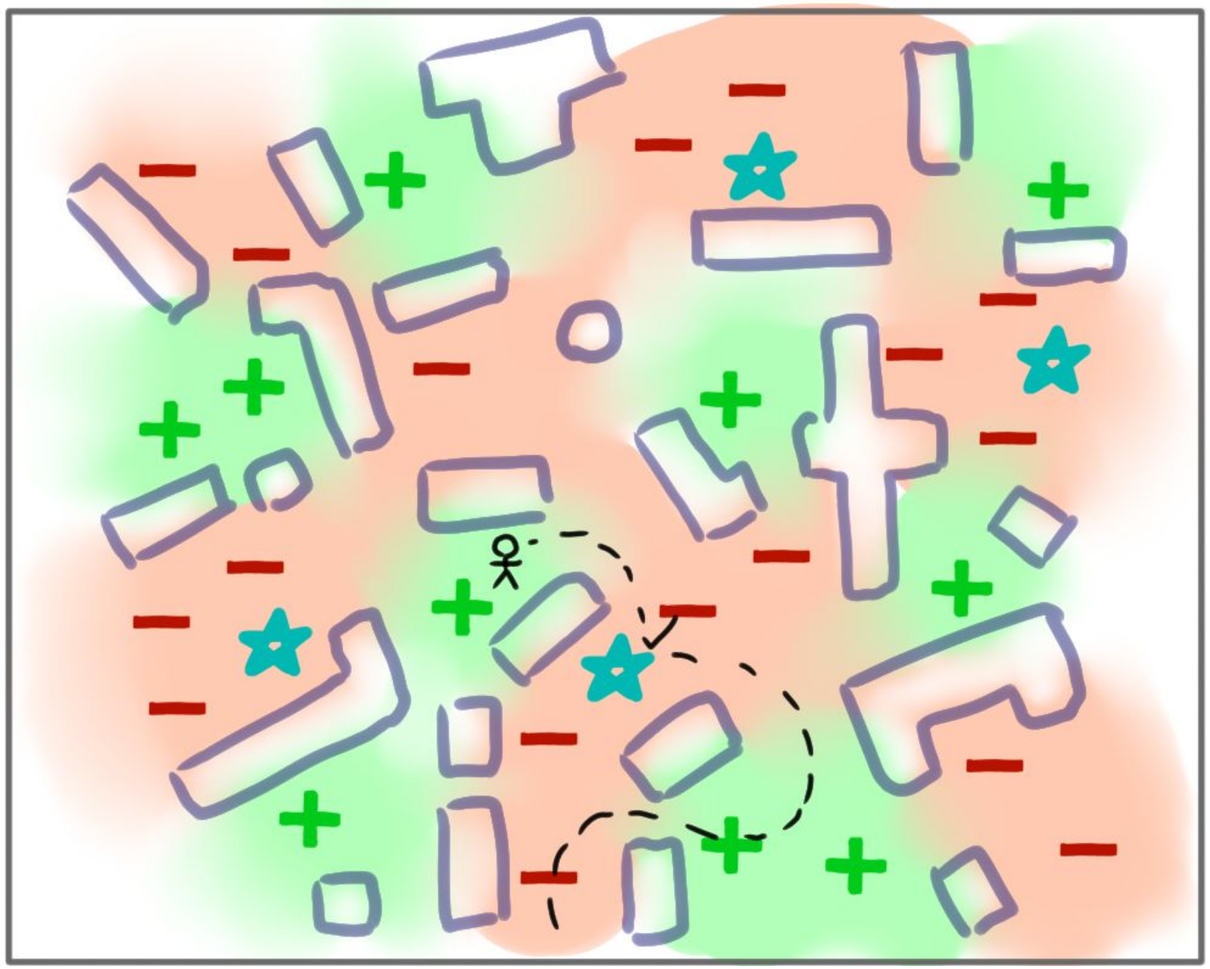

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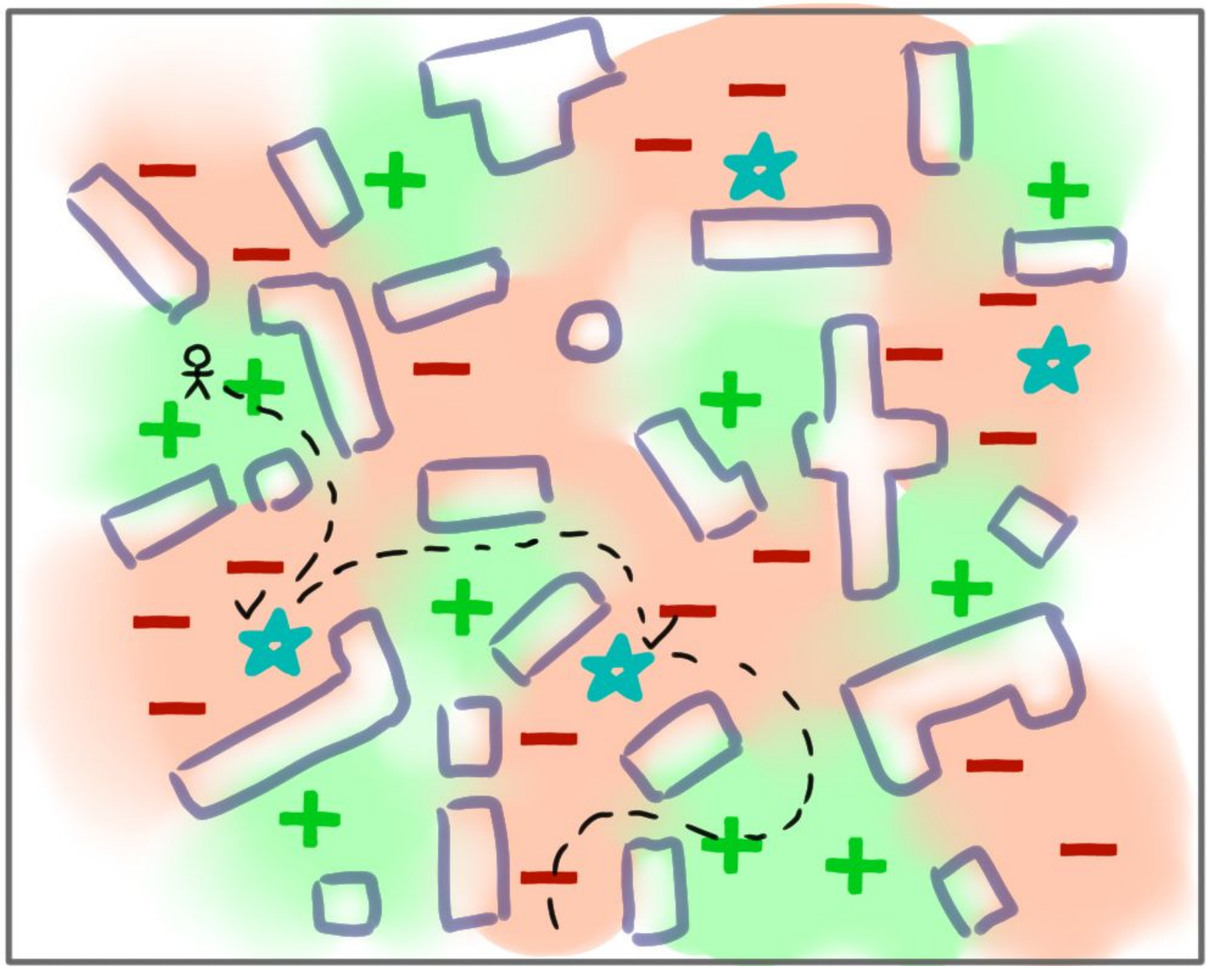
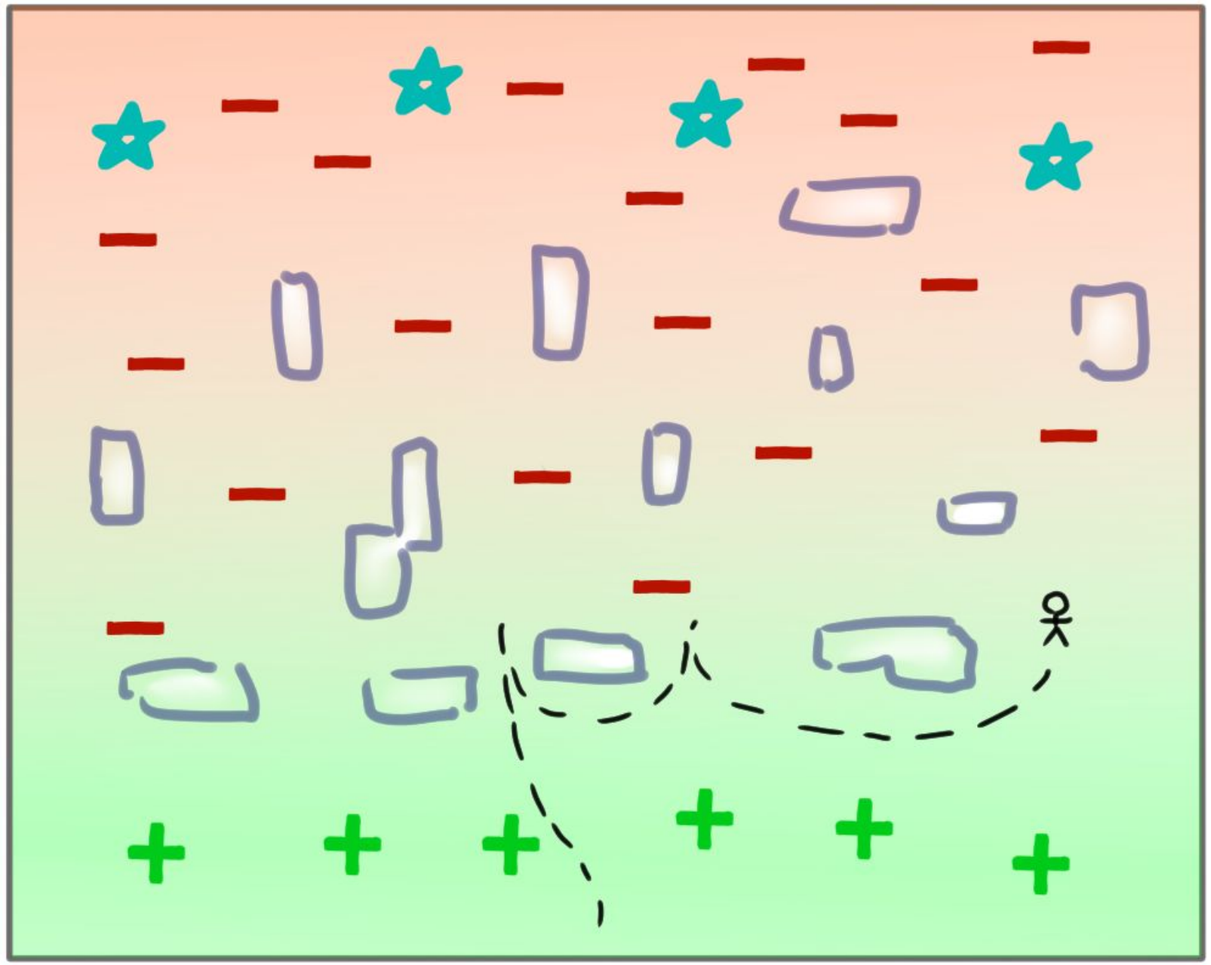


Field Layout



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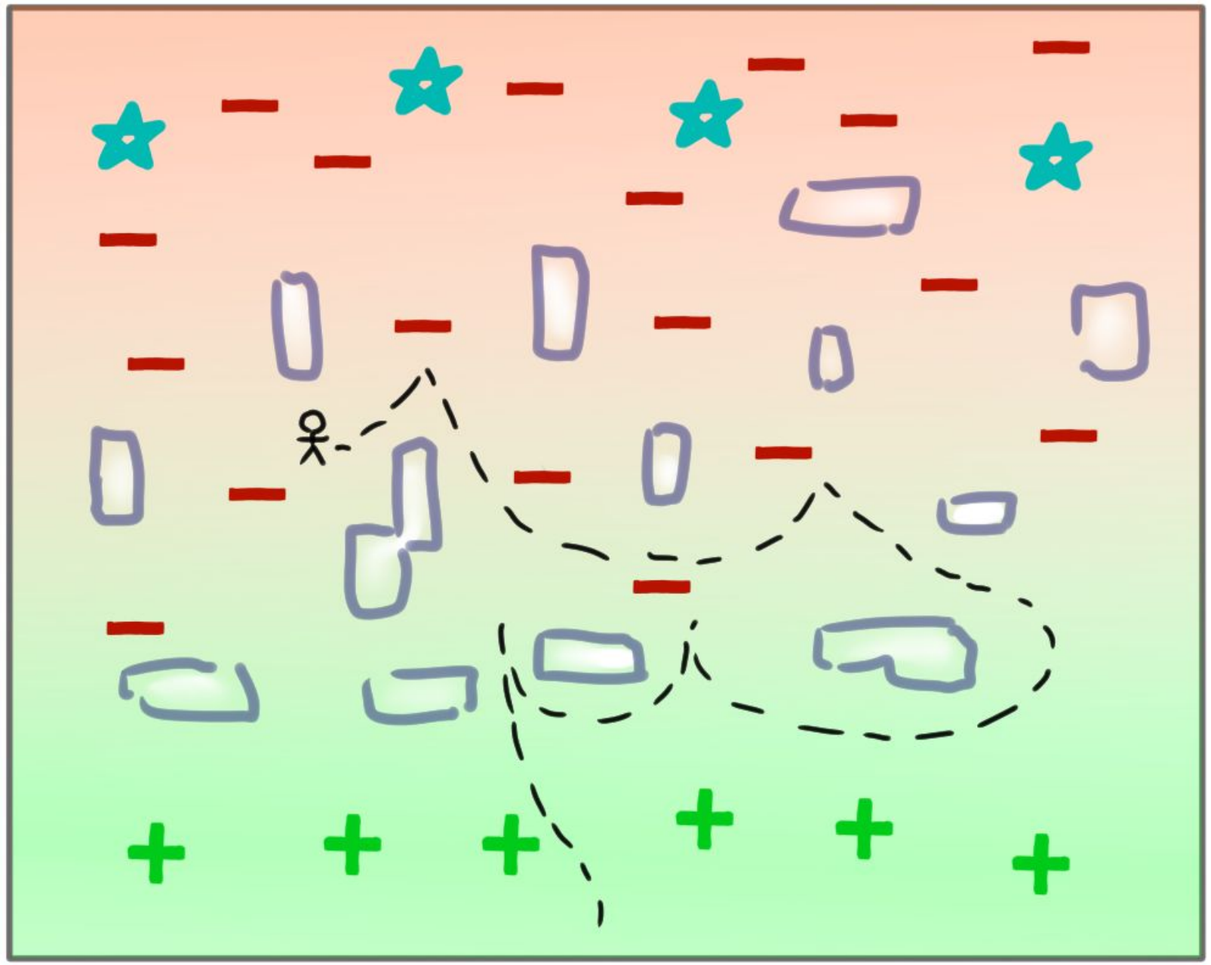

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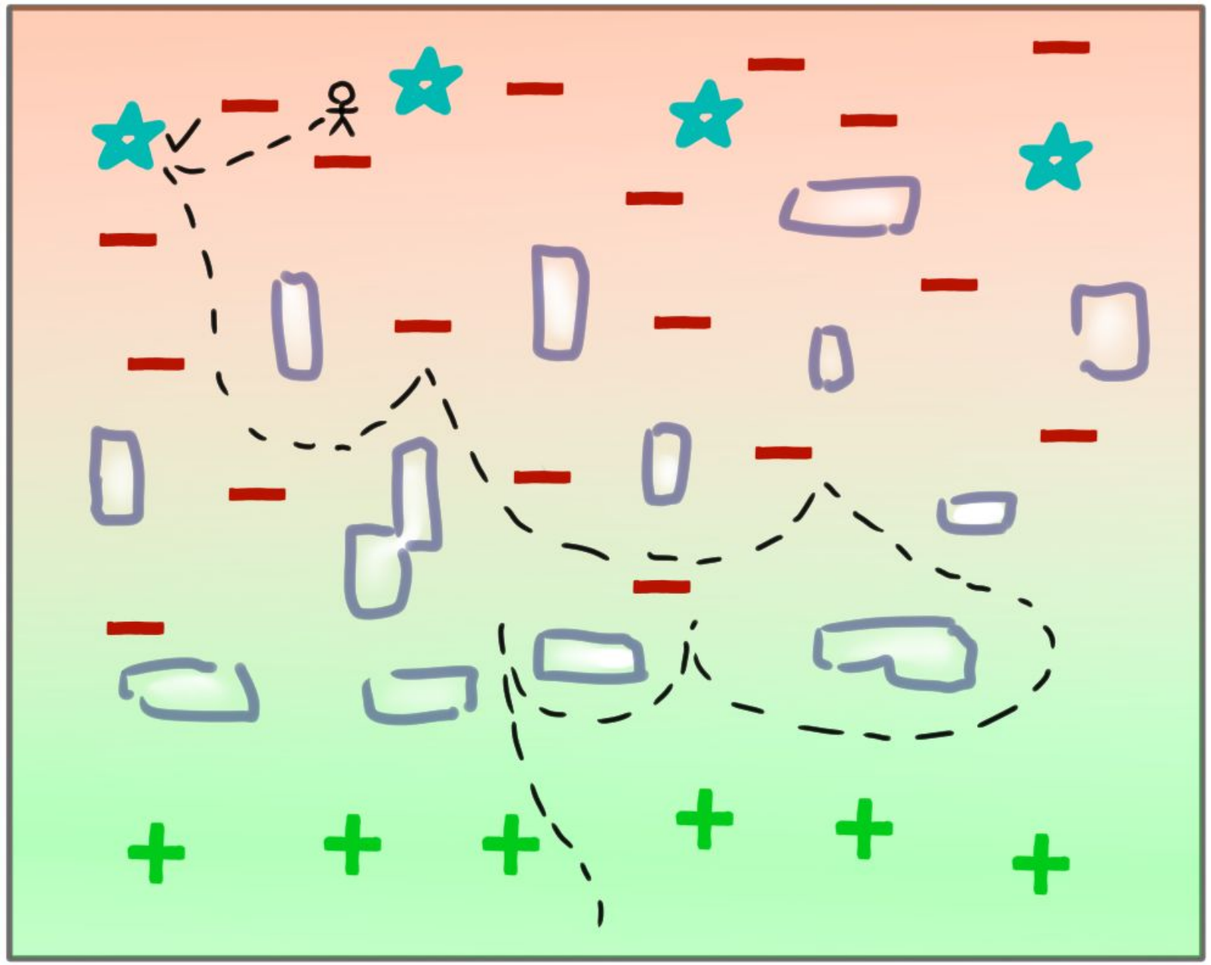
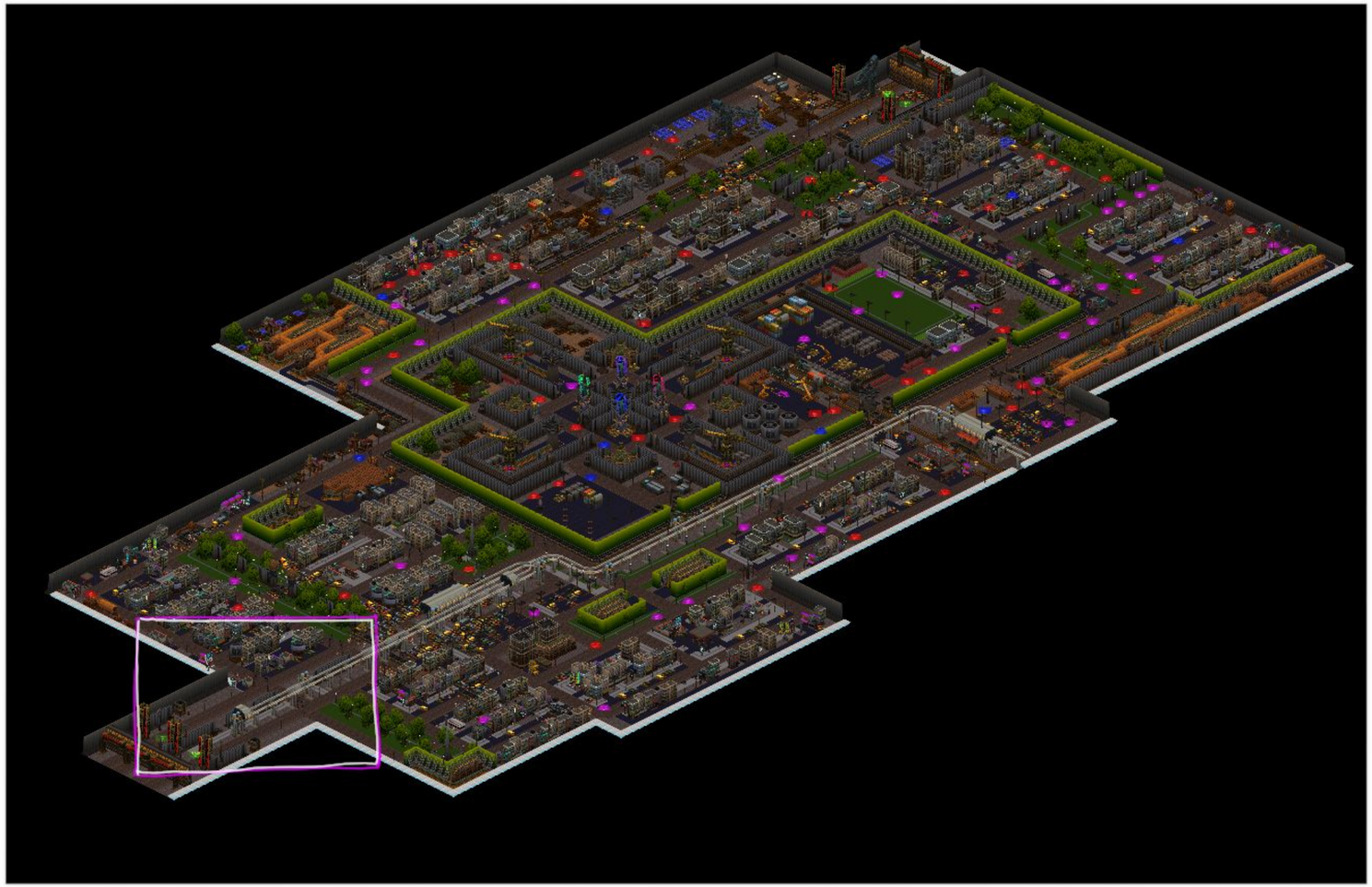


Find a Gameplay Concept

This usually involves a lot of playtesting and prototypes

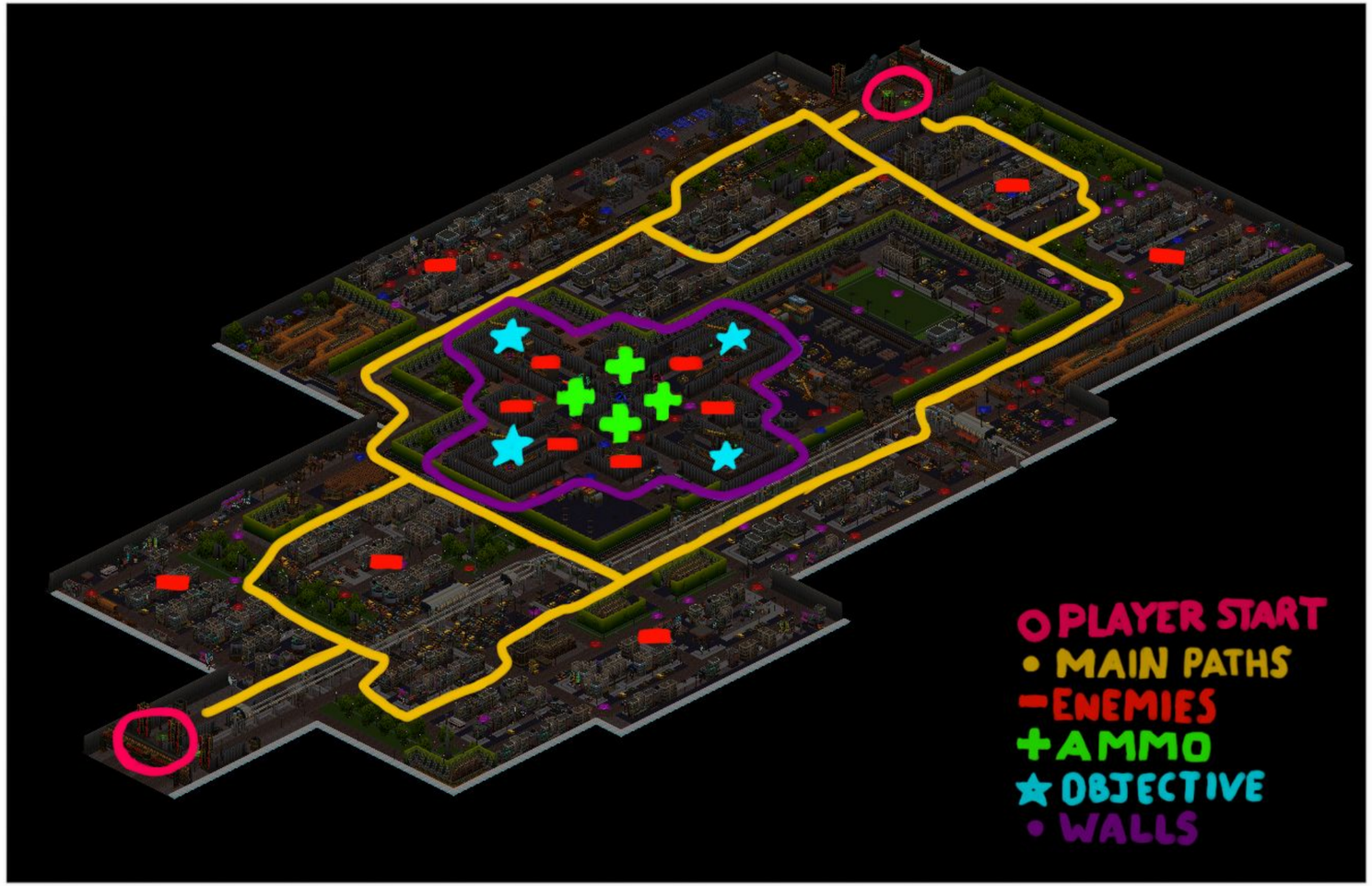
Brigador

Brigador



Brigador

Trap Concept



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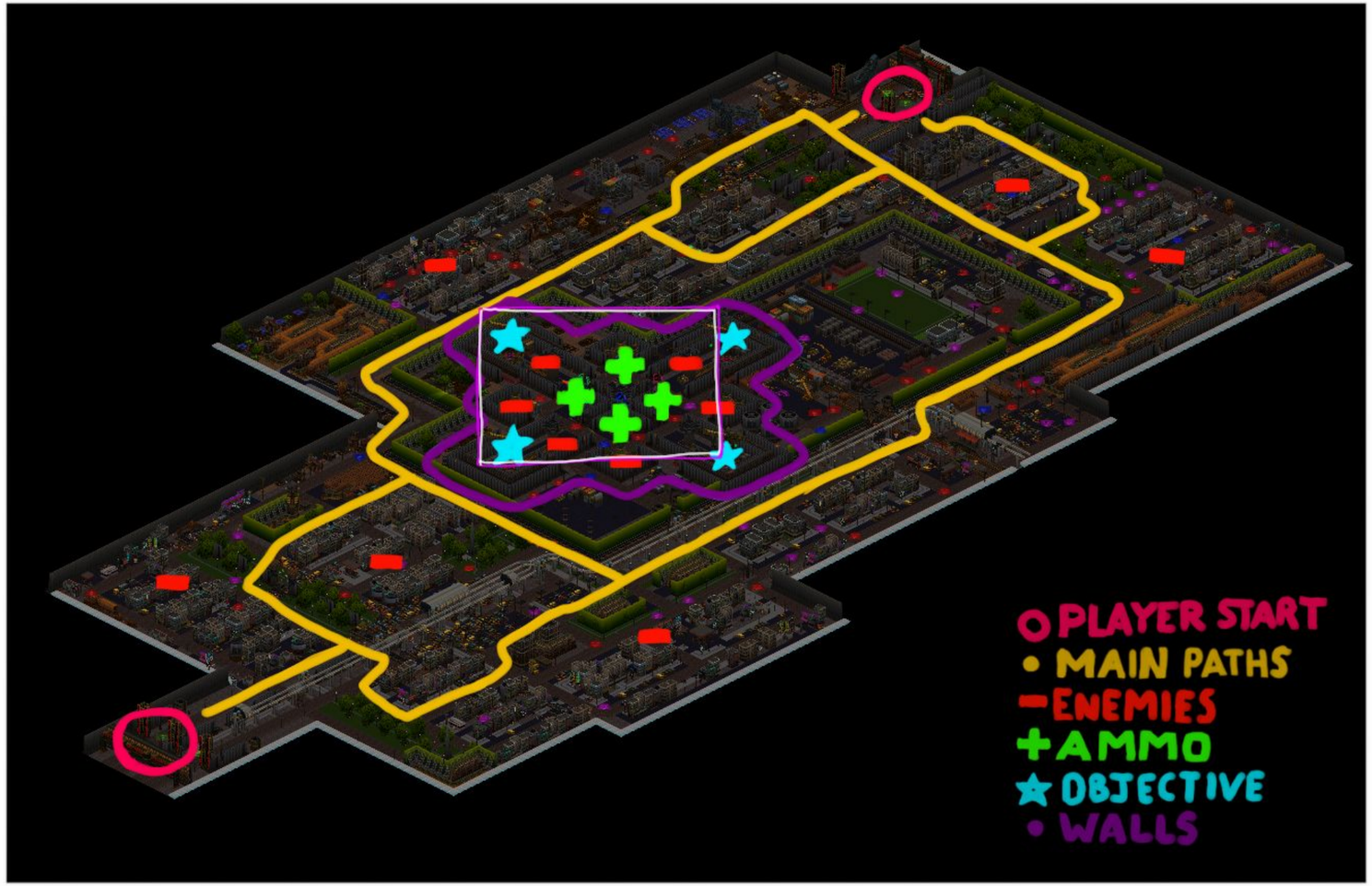

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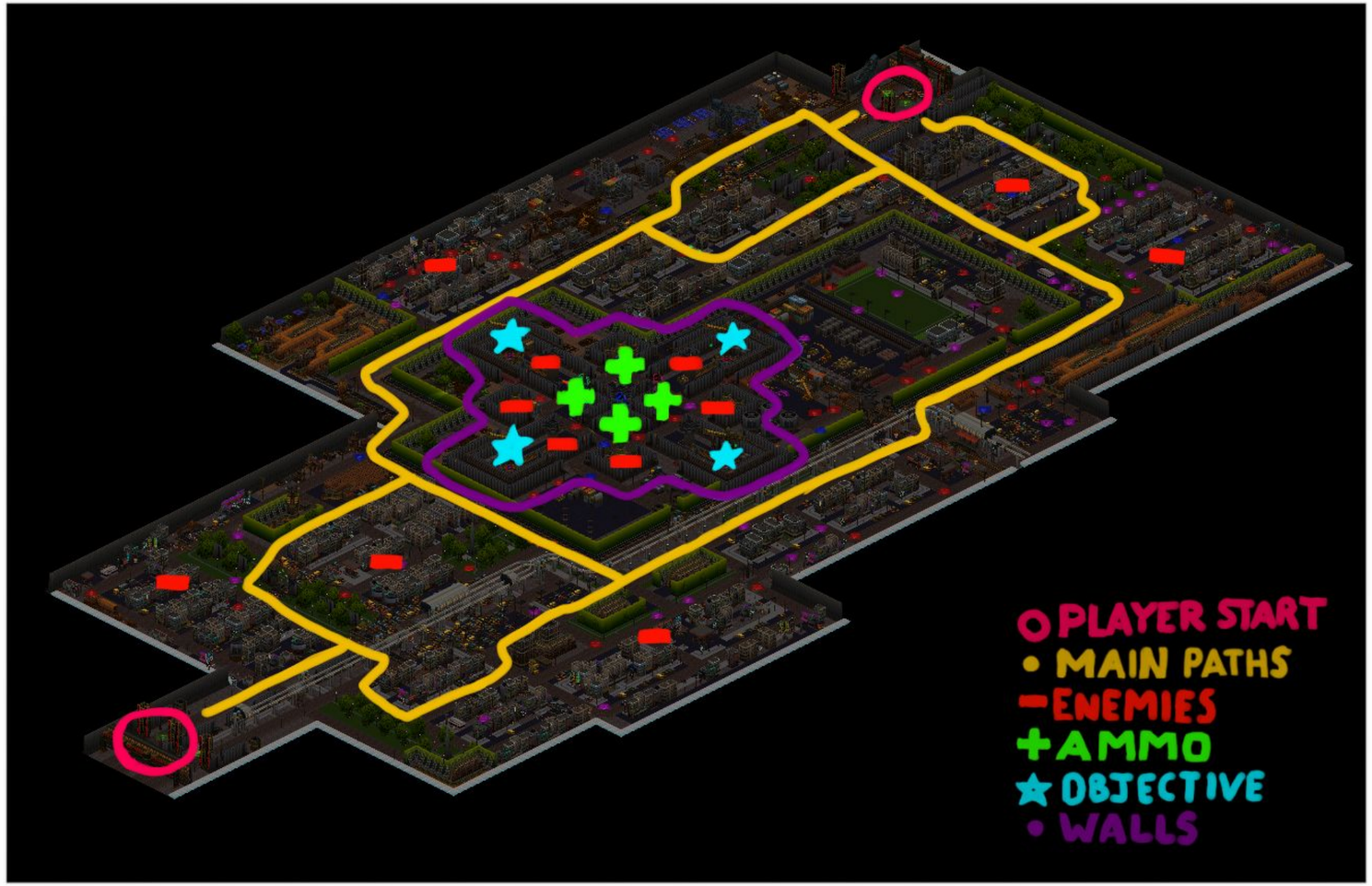
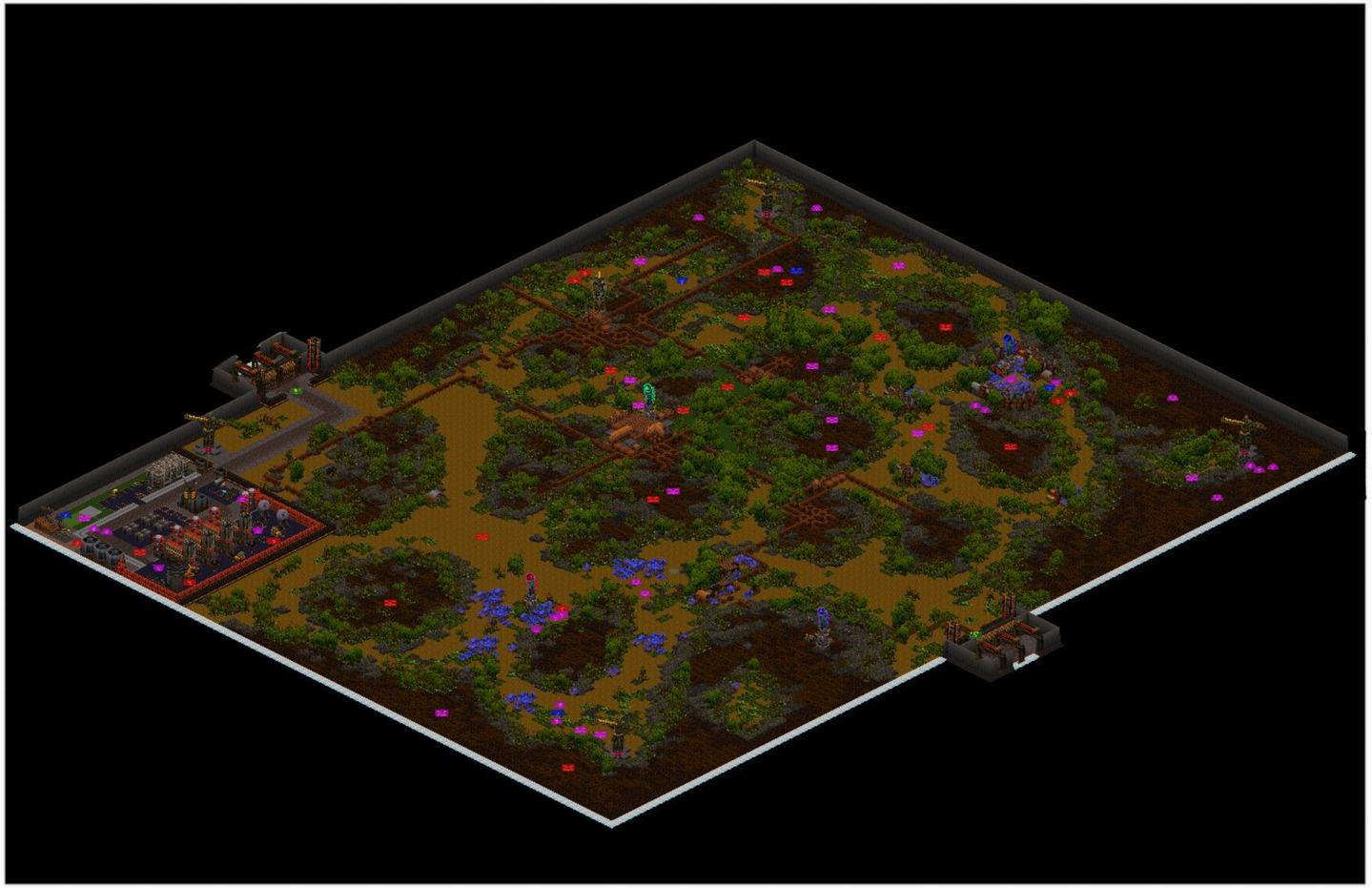


Exposed Concept



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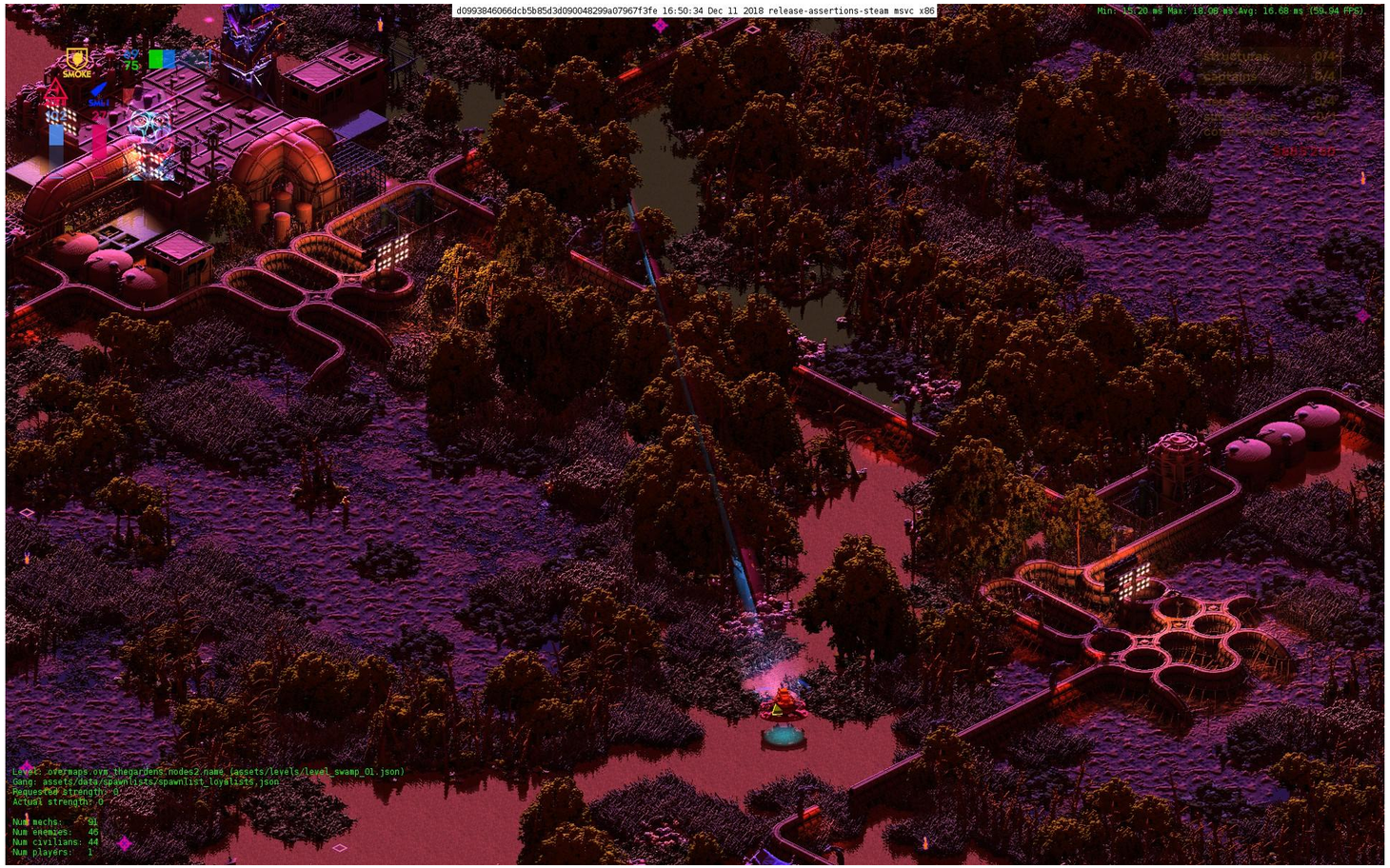
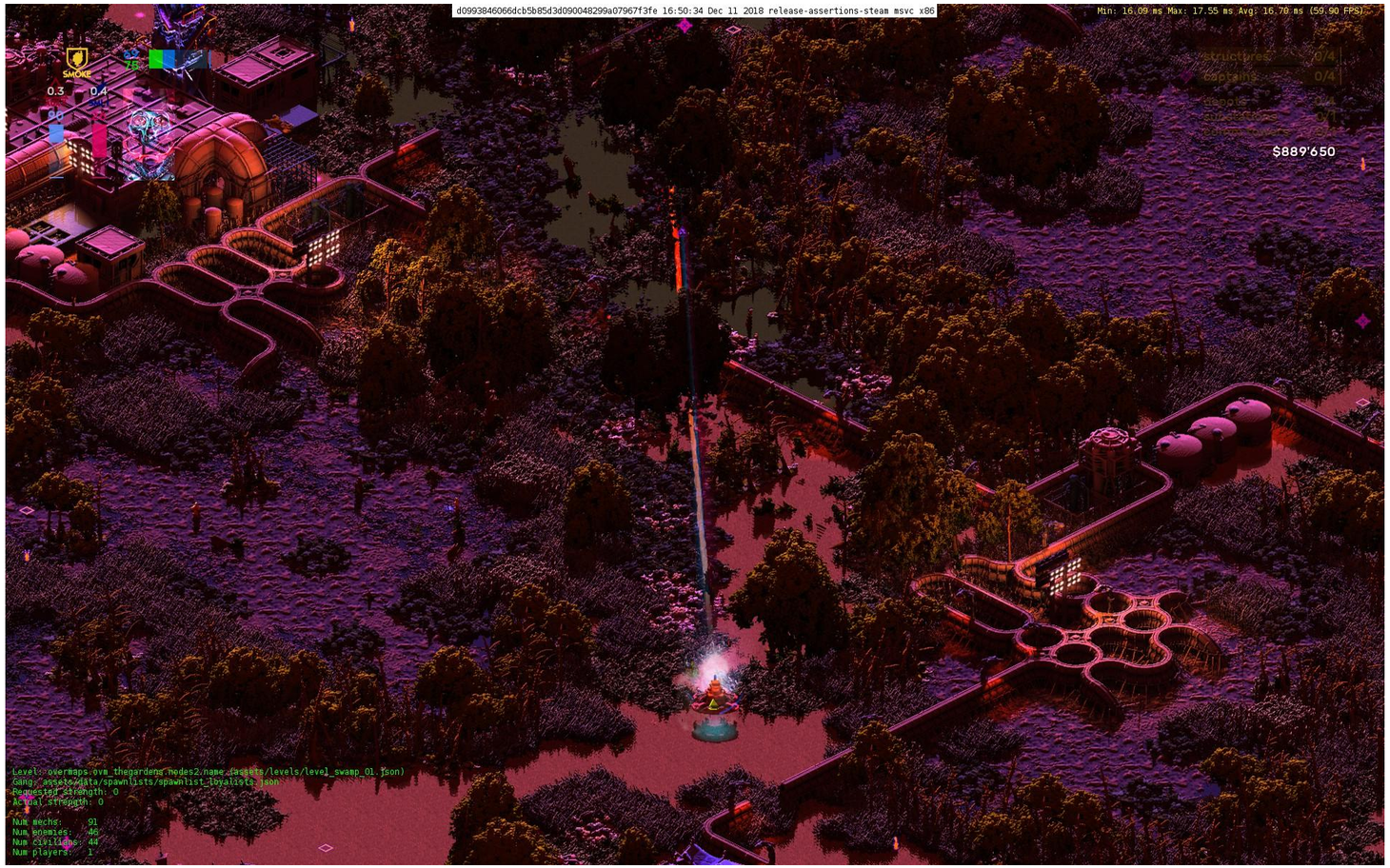
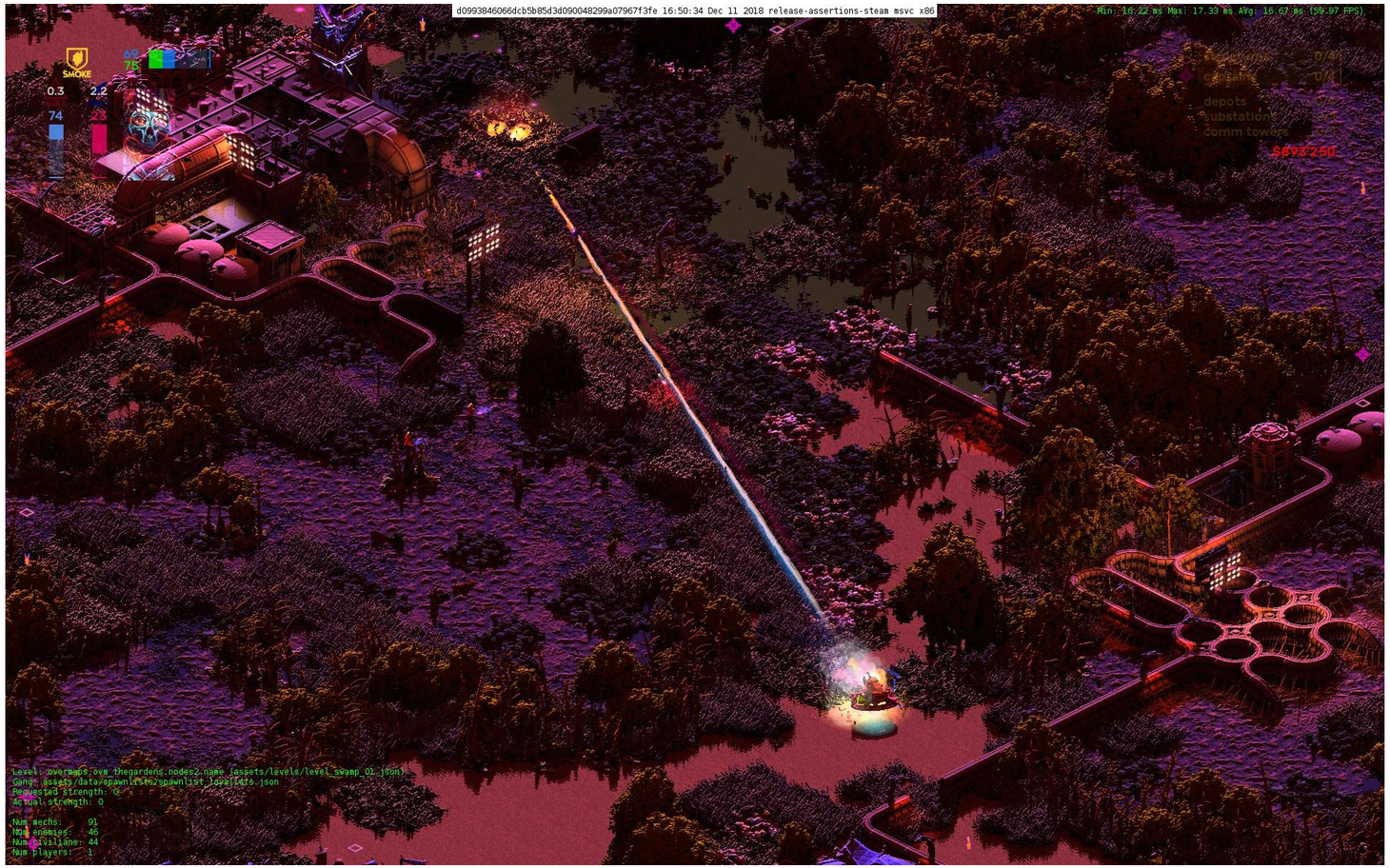


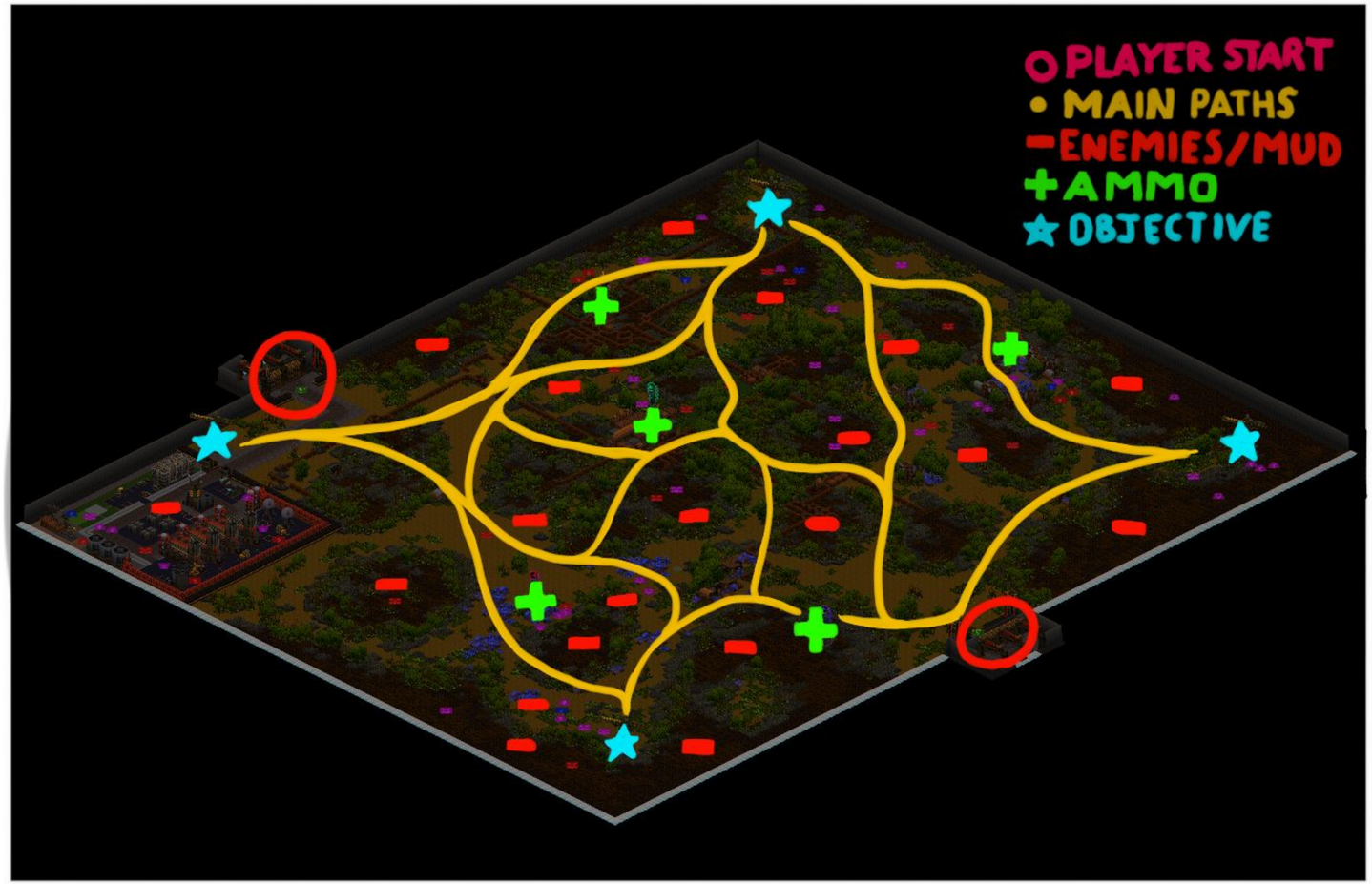
Exposed Concept



Exposed Concept



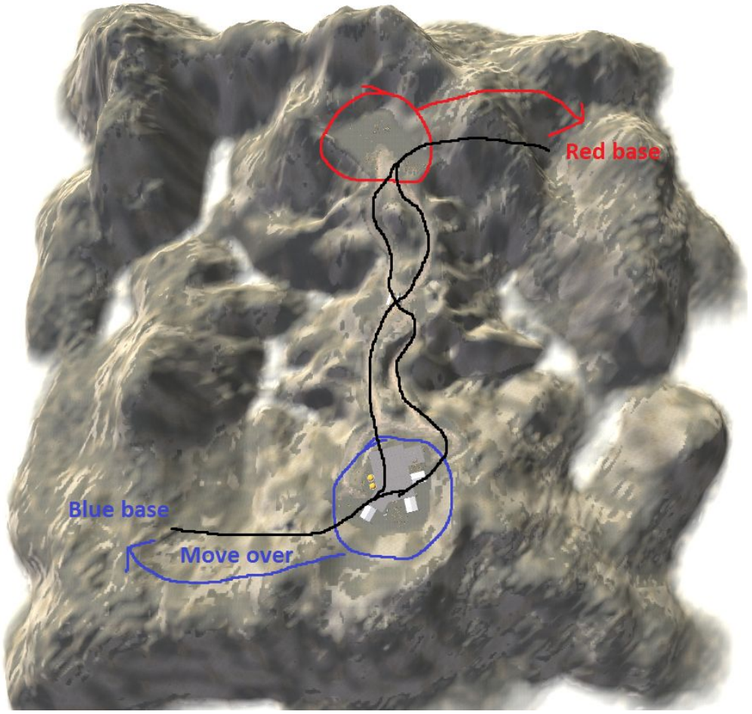
Exposed Concept

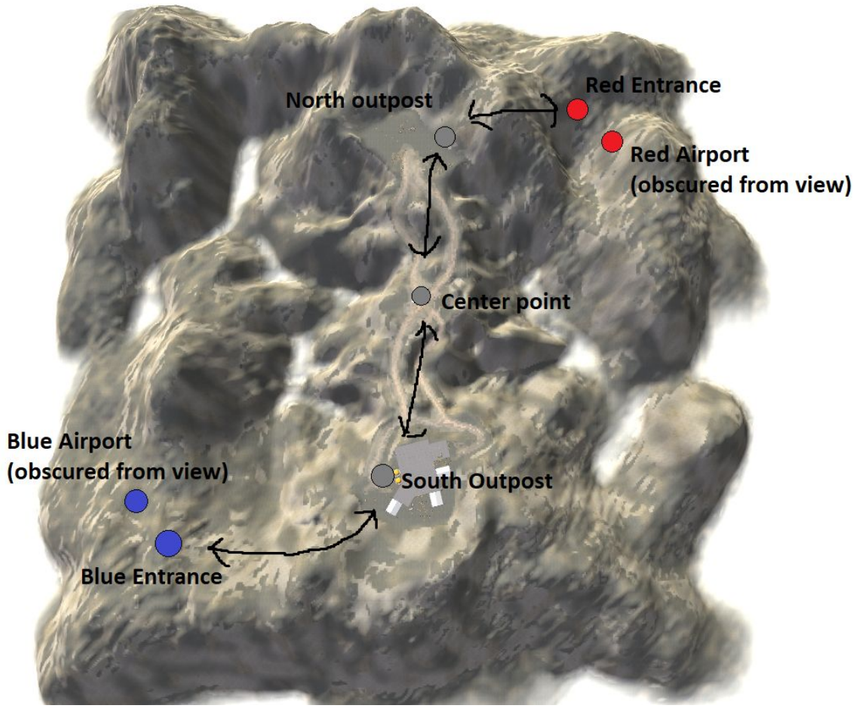


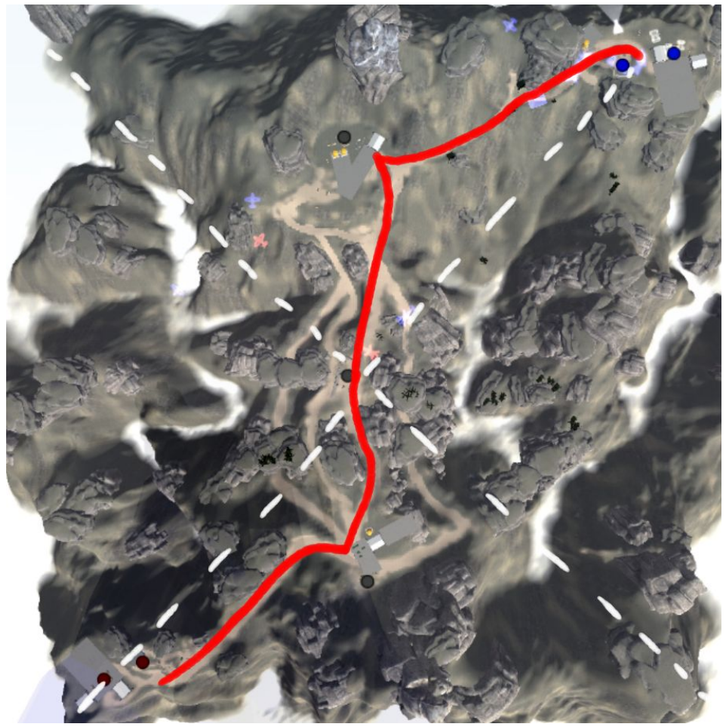
Ravenfield

Air War Concept

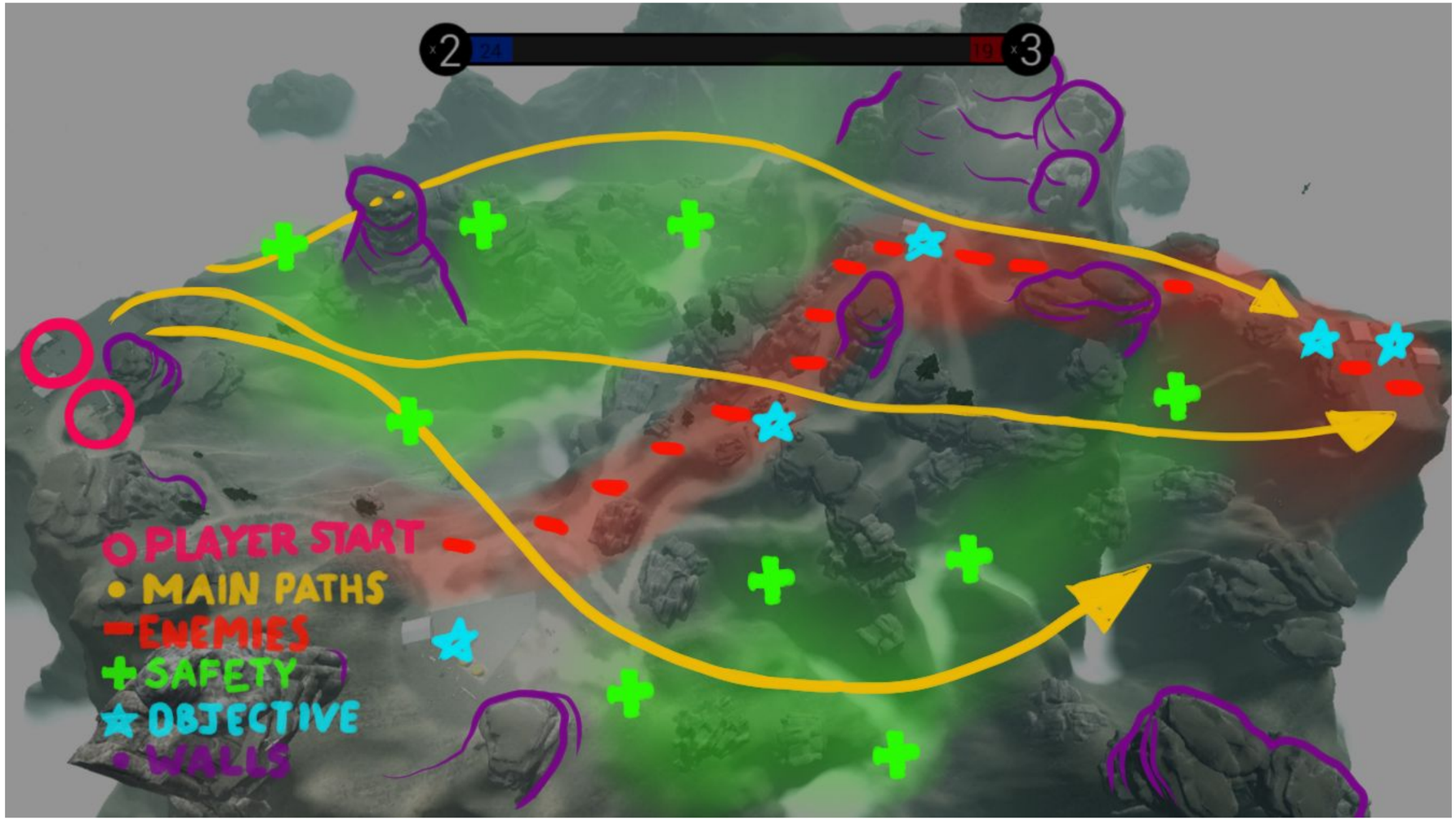
Air War Concept



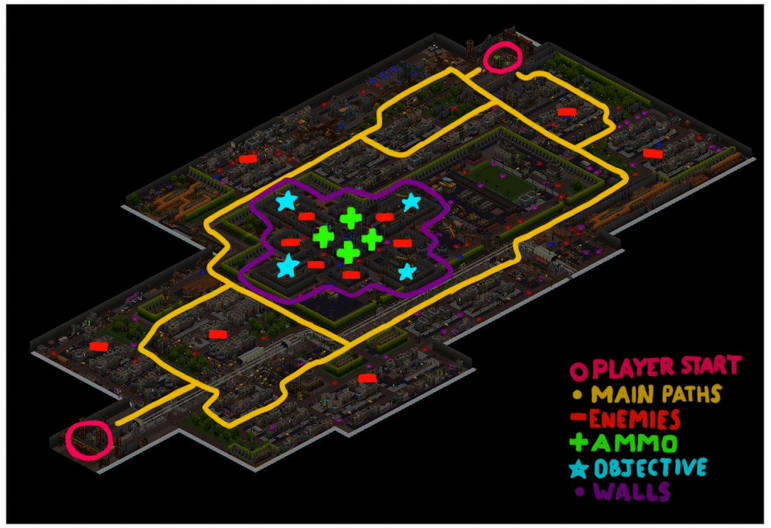


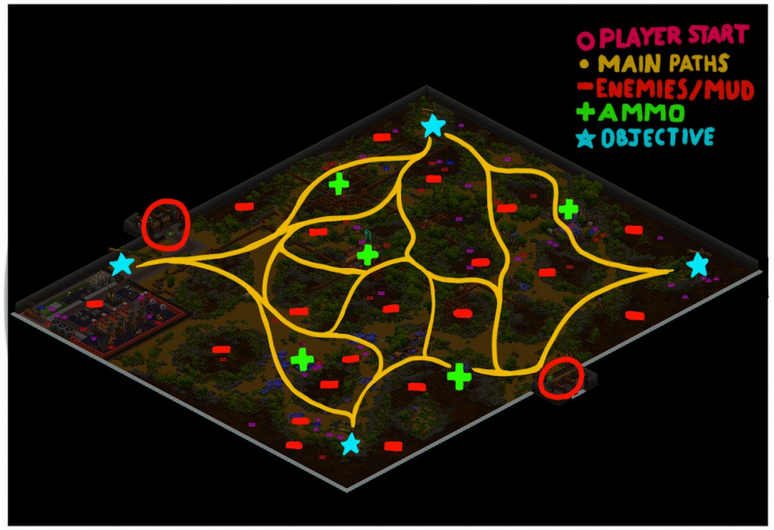


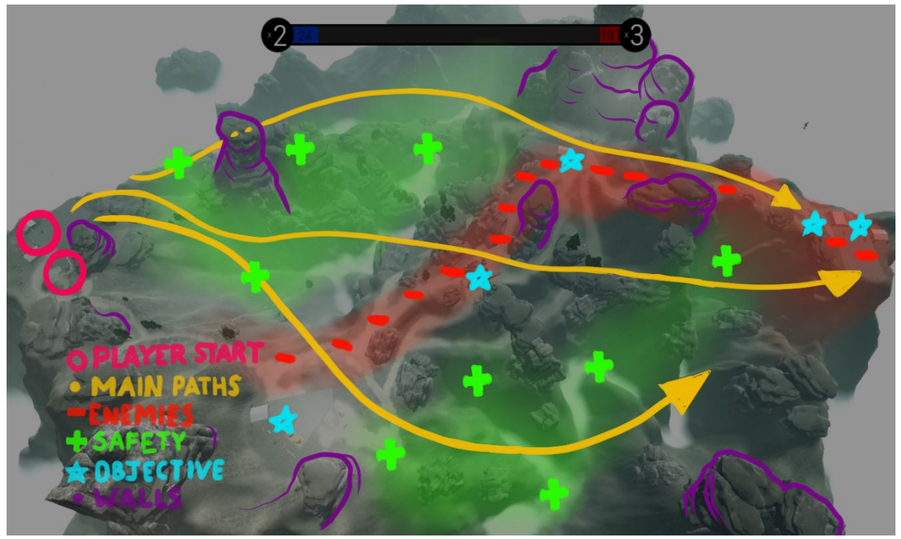
Air War Concept



Air War Concept


PLAYER START
MAIN PATHS
ENEMIES
AMMO
OBJECTIVE
WALLS


PLAYER START
MAIN PATHS
ENEMIES/MUD
AMMO
OBJECTIVE


2
3
PLAYER START
MAIN PATHS
ENEMIES
SAFETY
OBJECTIVE
WALLS

Section 3

How to troubleshoot Nonlinear Level problems?

Common Issues

- Too linear
-
-
-
-
-
-

Common Issues

- Too linear → Open more space
-
-
-
-
-
-

Common Issues

- Too linear → Open more space
- One solution
-
-
-
-
-

Common Issues

- Too linear → Open more space
- One solution → Trust the gameplay, give it room
-
-
-
-
-

Common Issues

- Too linear → Open more space
- One solution → Trust the gameplay, give it room
- No structure
-
-
-
-

Common Issues

- Too linear → Open more space
- One solution → Trust the gameplay, give it room
- No structure → Use layout, theme
-
-
-
-

Common Issues

- Too linear → Open more space
- One solution → Trust the gameplay, give it room
- No structure → Use layout, theme
- Not reactive
-
-
-

Common Issues

- Too linear → Open more space
- One solution → Trust the gameplay, give it room
- No structure → Use layout, theme
- Not reactive → Balance around the player
-
-
-

Common Issues

- Too linear → Open more space
- One solution → Trust the gameplay, give it room
- No structure → Use layout, theme
- Not reactive → Balance around the player
- Feels “random”, “empty”
-
-

Common Issues

- Too linear → Open more space
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- Not reactive → Balance around the player
- Feels “random”, “empty” → Communicate more/better
-
-

Common Issues

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- One solution → Trust the gameplay, give it room
- No structure → Use layout, theme
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- Feels “random”, “empty” → Communicate more/better
- Not enough gameplay
-

Common Issues

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- Not enough gameplay → Talk to your design team
-

Common Issues

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- One solution → Trust the gameplay, give it room
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- Not reactive → Balance around the player
- Feels “random”, “empty” → Communicate more/better
- Not enough gameplay → Talk to your design team
- Not the right style

Common Issues

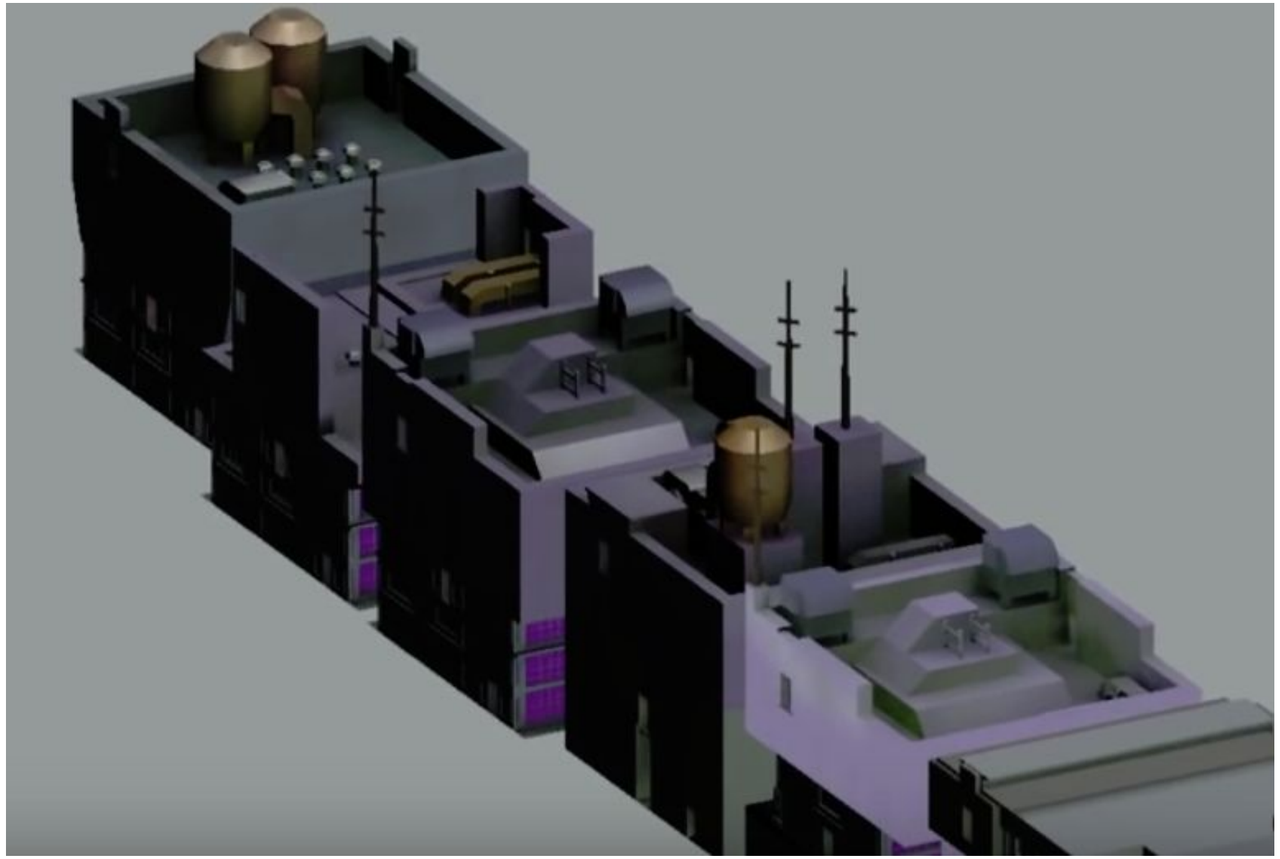
- Too linear → Open more space
- One solution → Trust the gameplay, give it room
- No structure → Use layout, theme
- Not reactive → Balance around the player
- Feels “random”, “empty” → Communicate more/better
- Not enough gameplay → Talk to your design team
- Not the right style → Make the map more linear

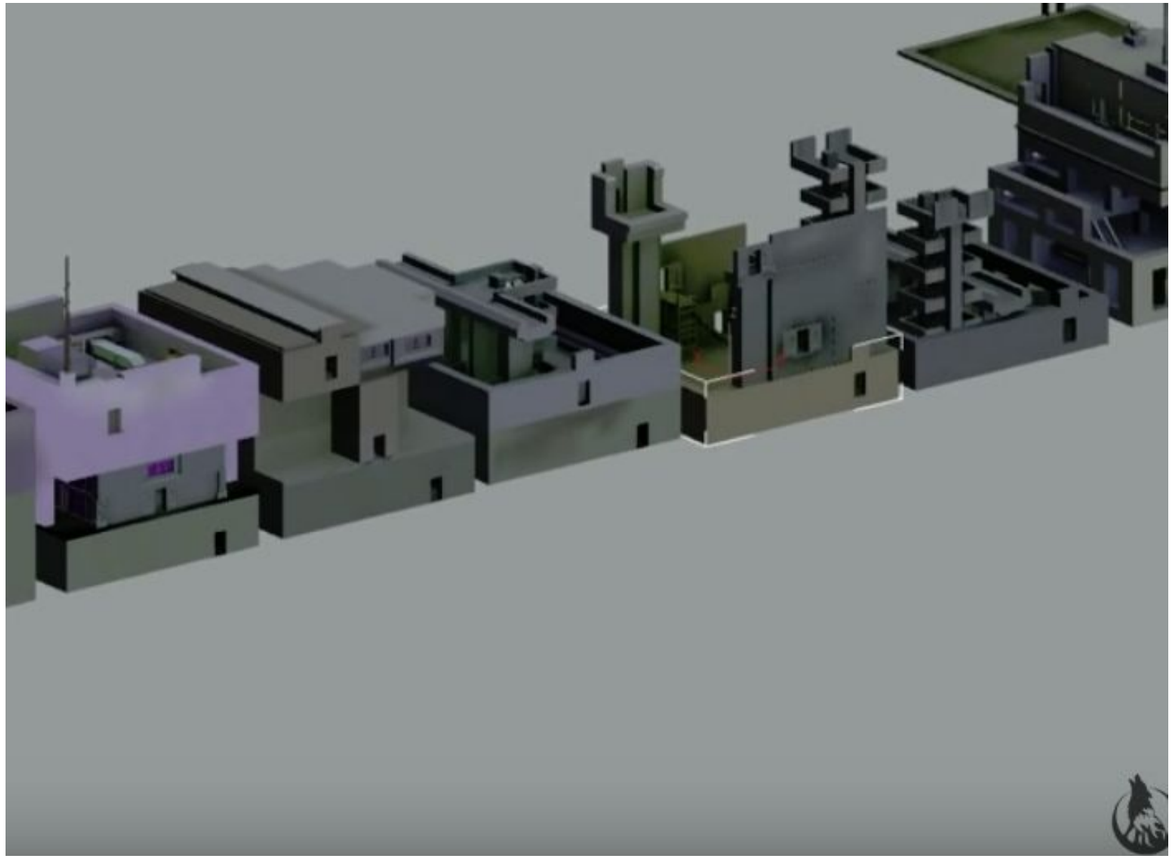
Recap and Final Example

How does this all fit together?

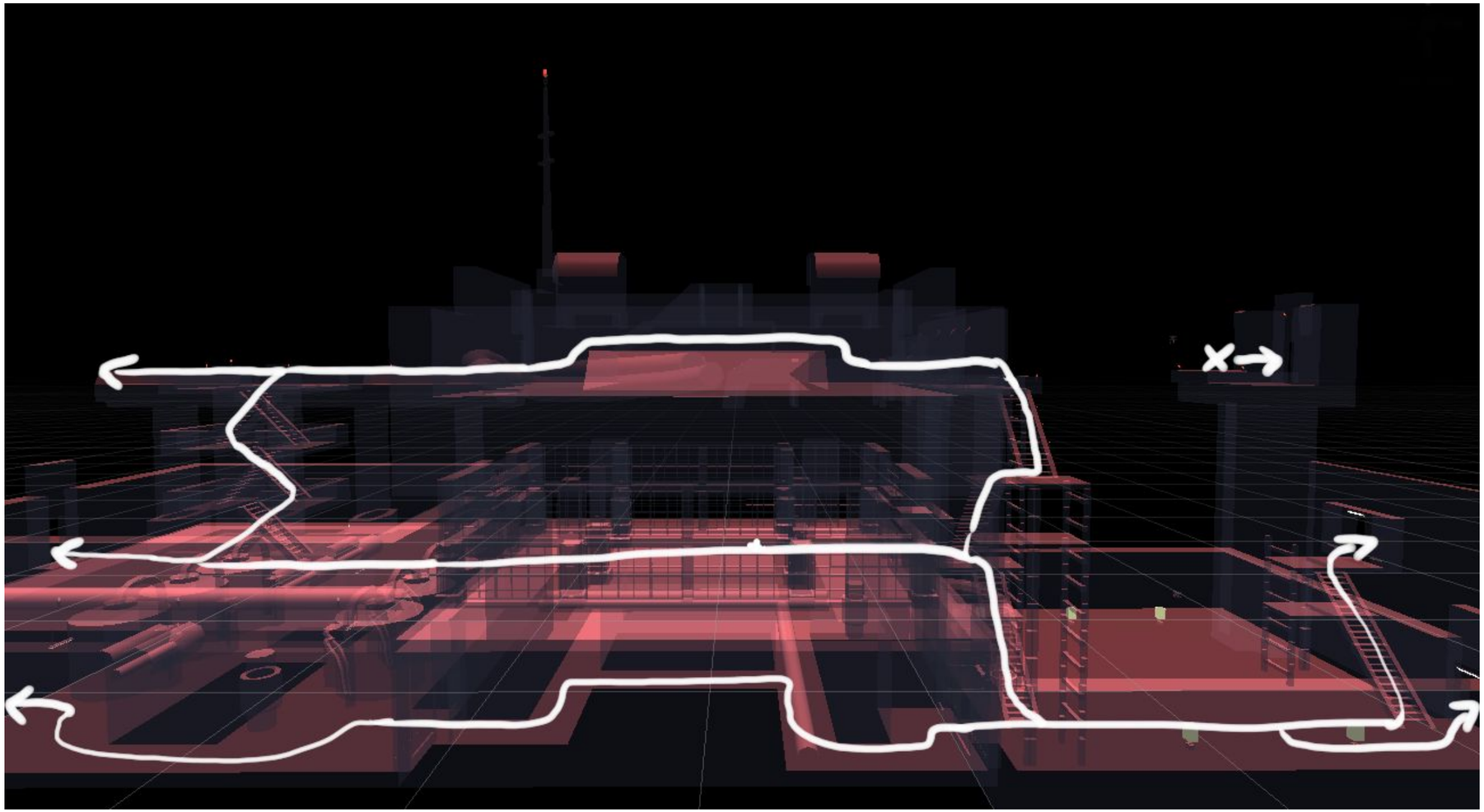
Receiver

Construction

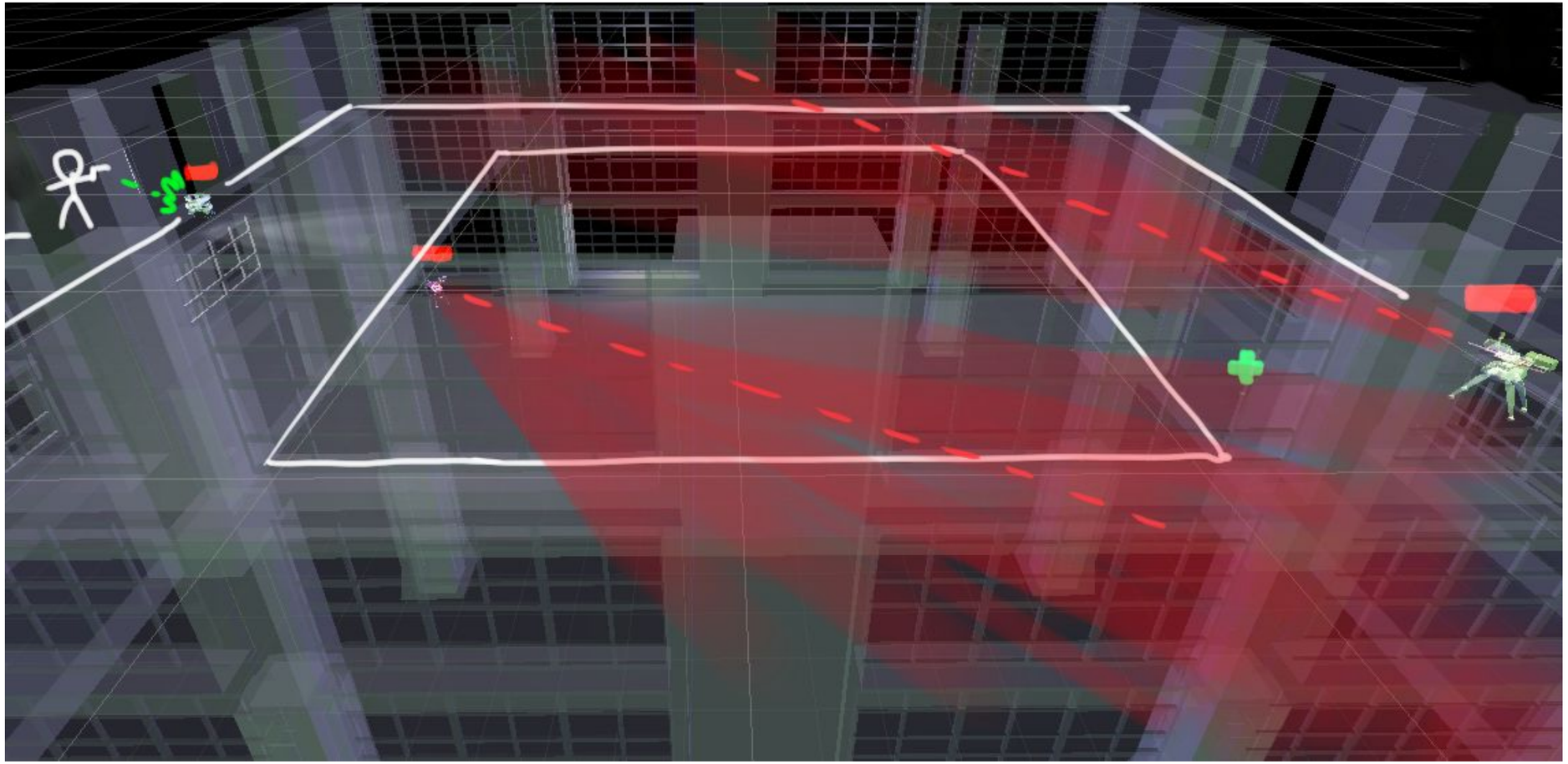




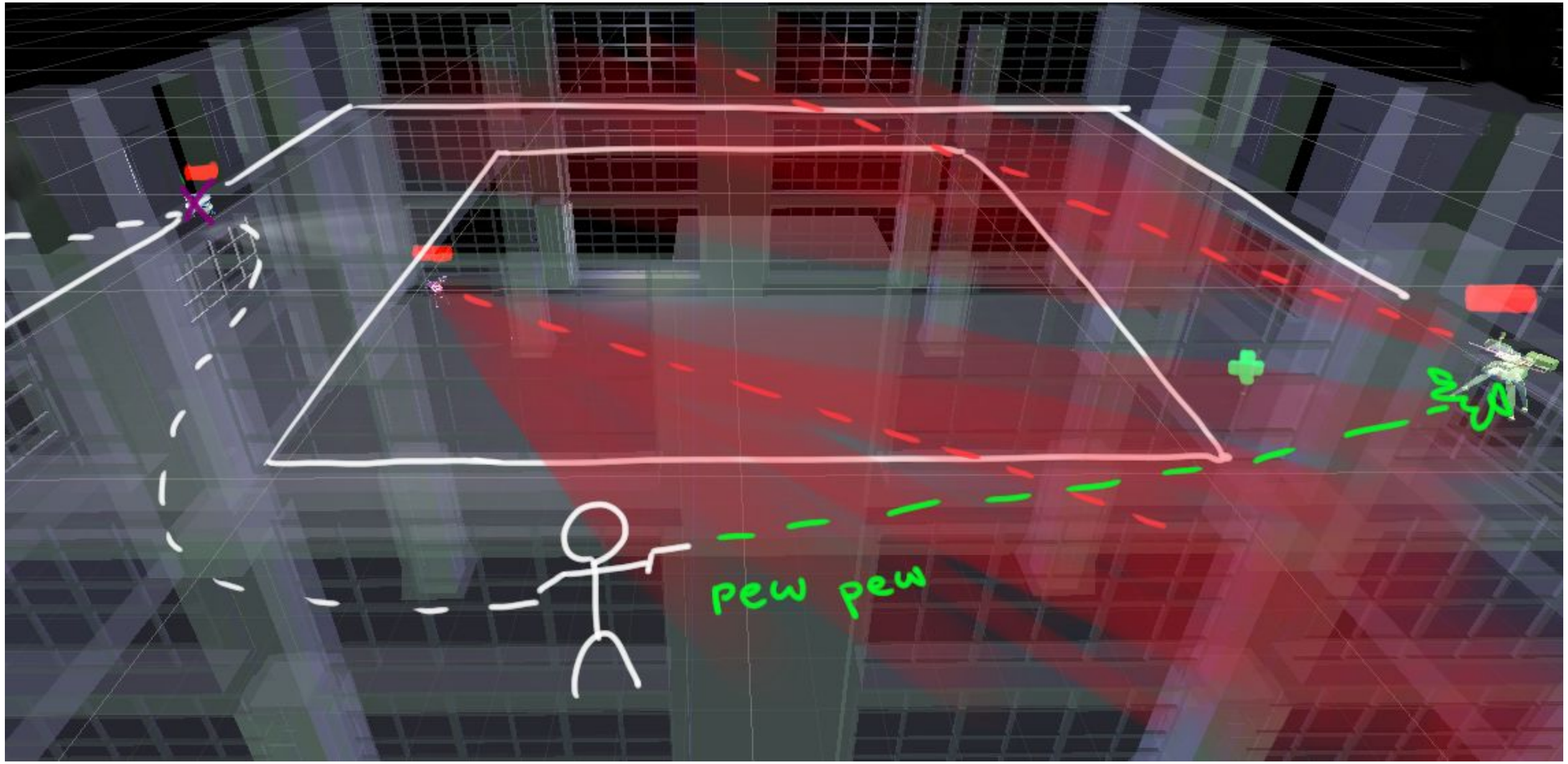
Strategic Choice



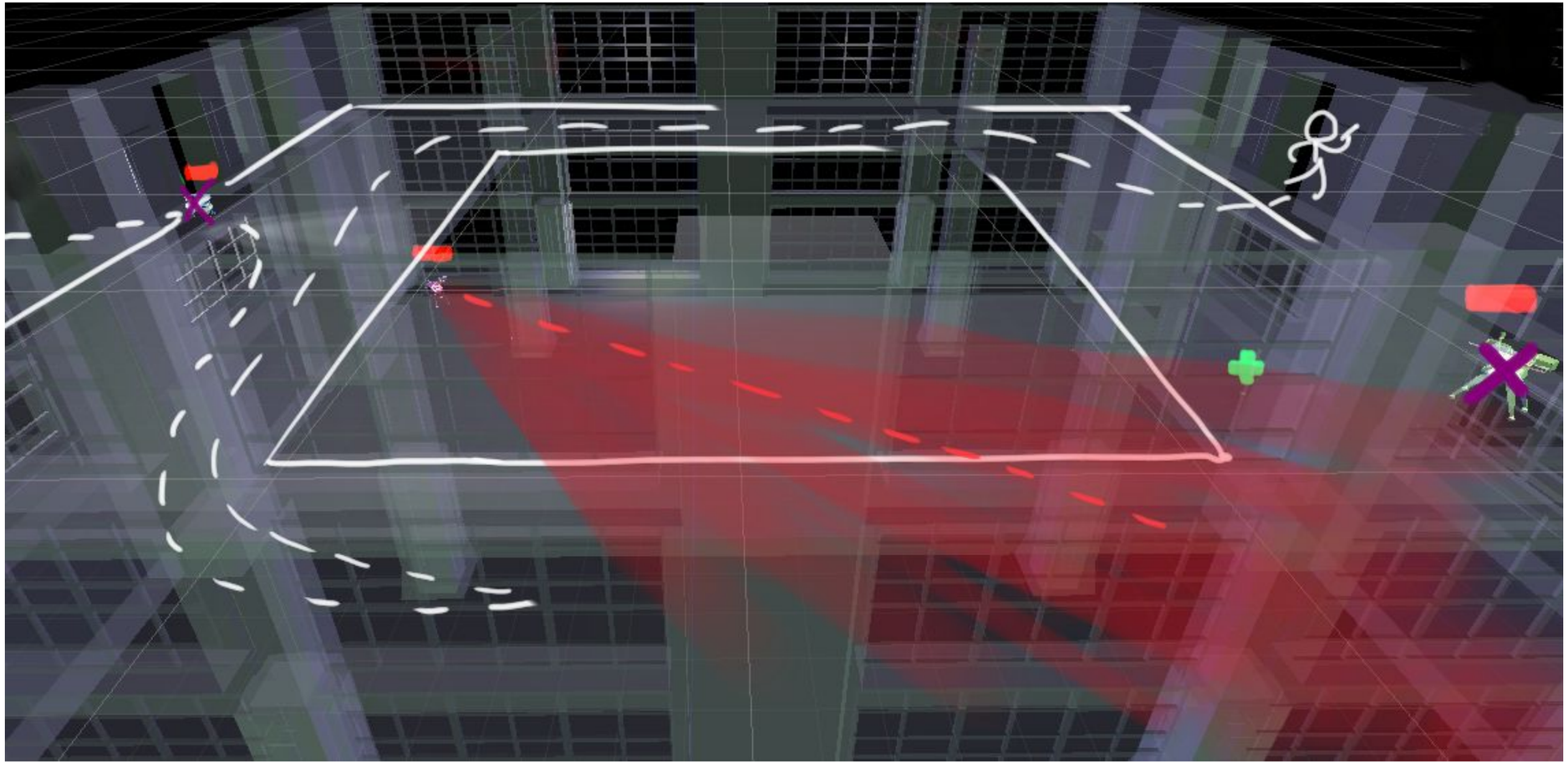
Tactical Choice



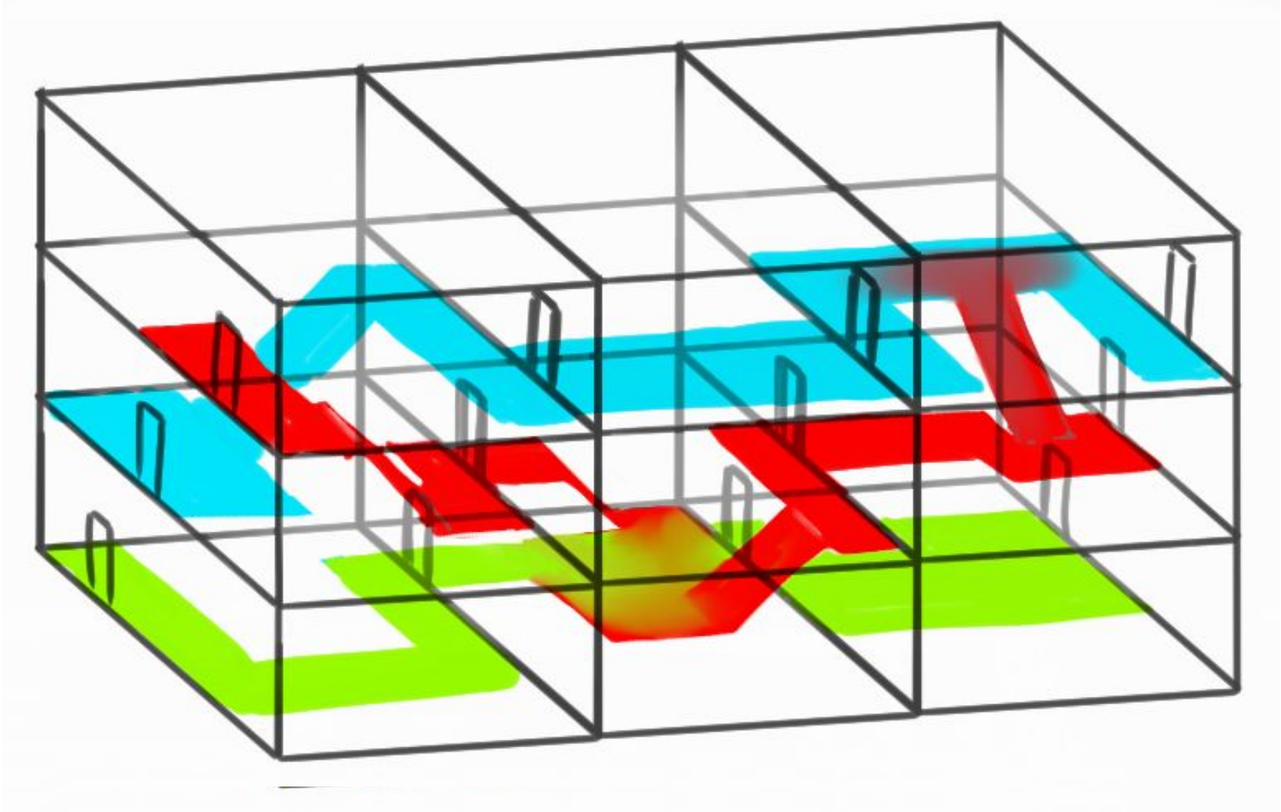
Tactical Choice



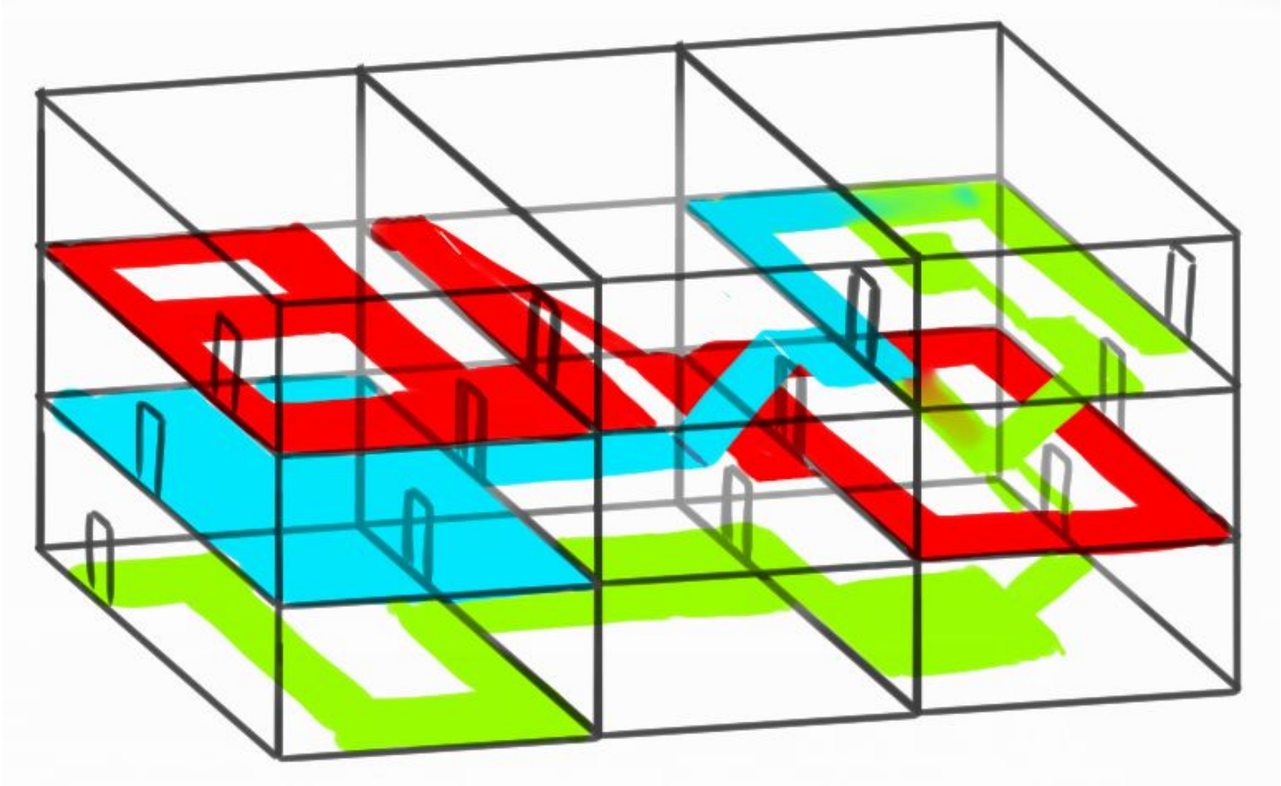
Tactical Choice



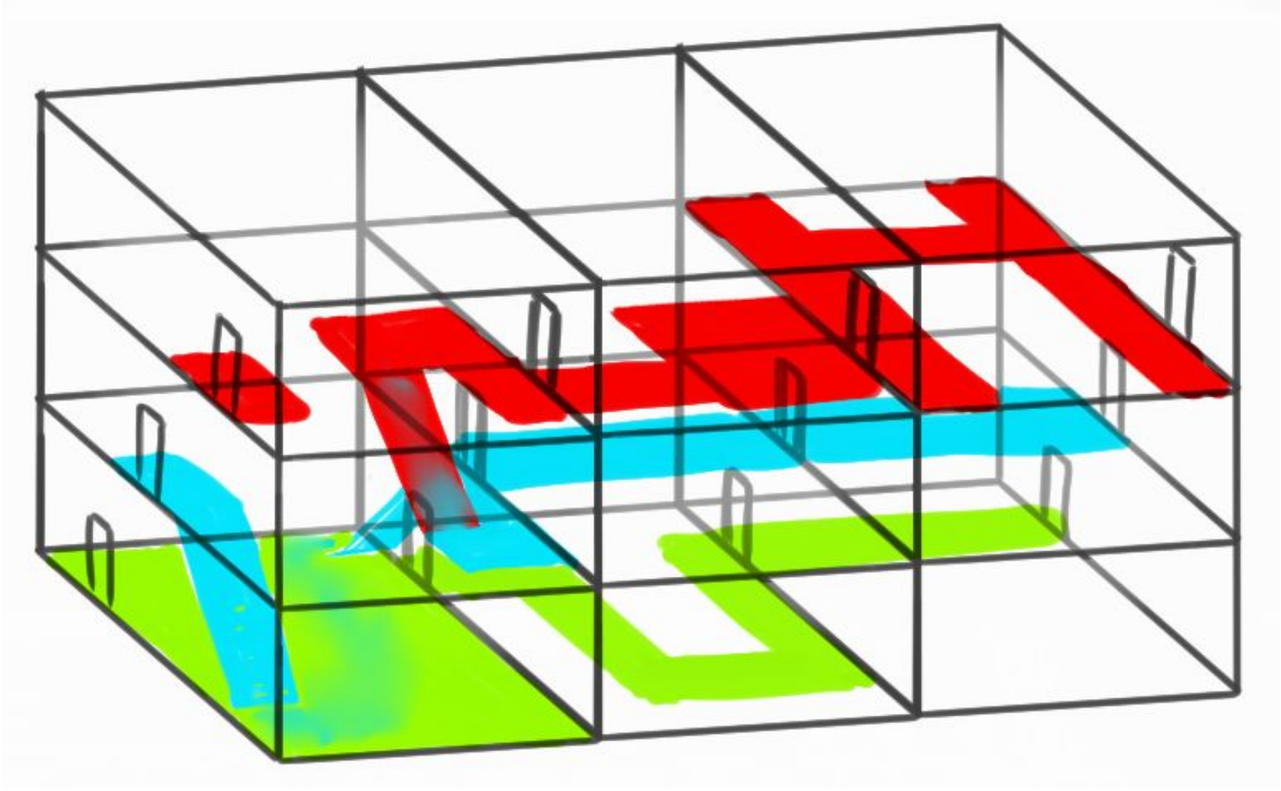
Radical Nonlinearity



Radical Nonlinearity

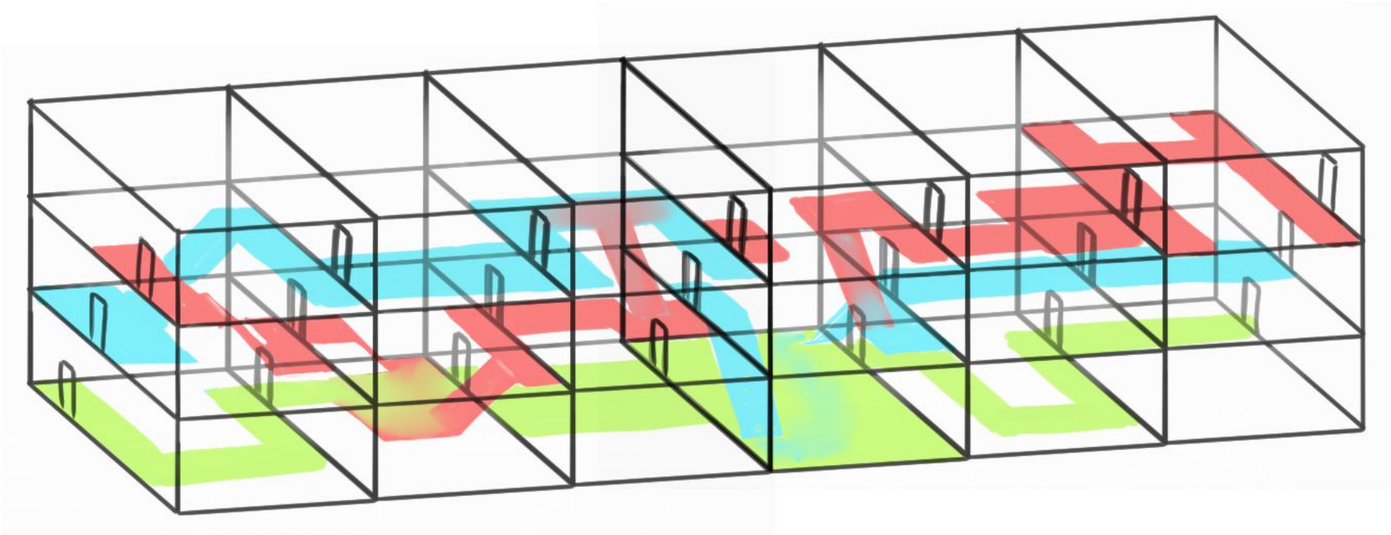


Radical Nonlinearity

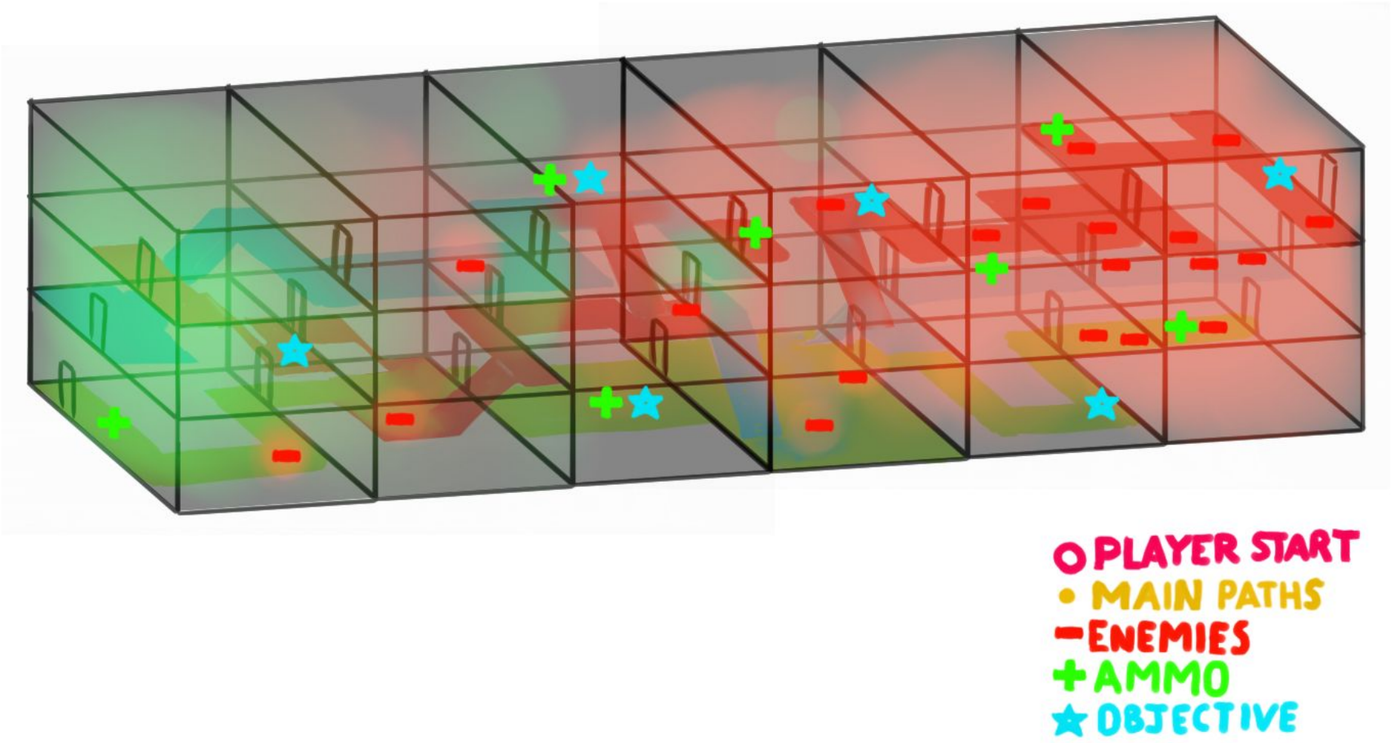


Narrative Tradeoffs

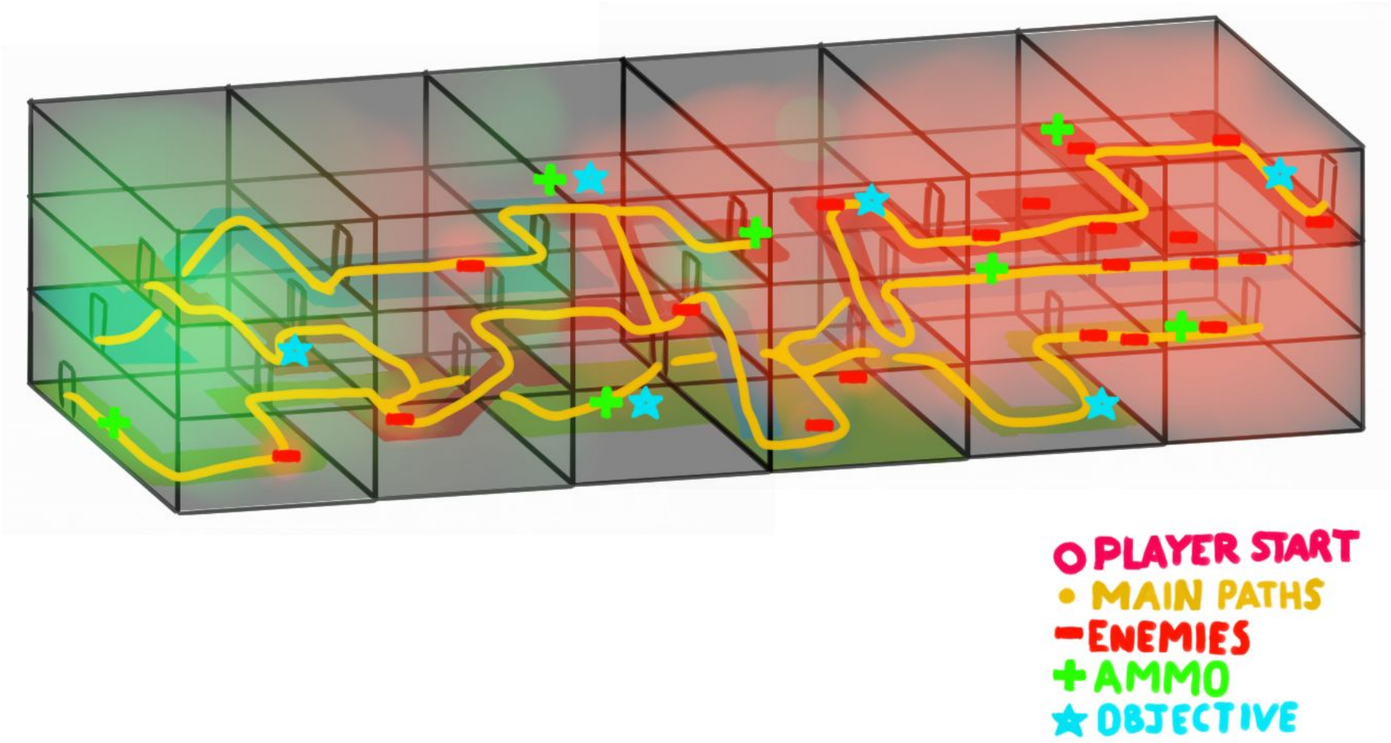
Pacing and Layout



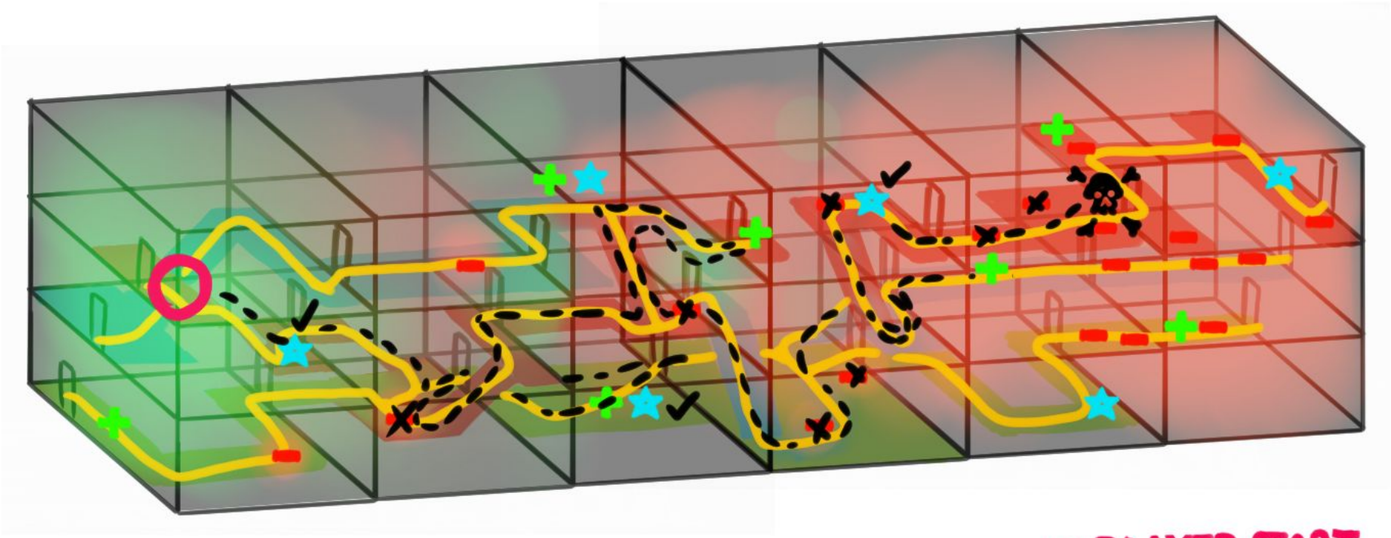
Pacing and Layout

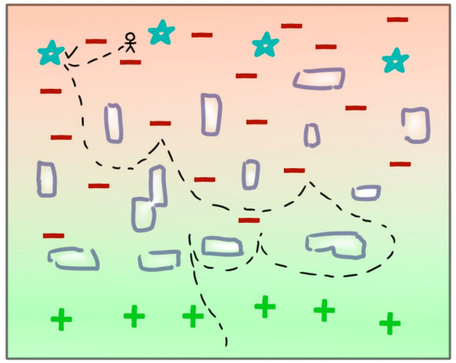


Pacing and Layout



Pacing and Layout





PLAYER START
MAIN PATHS
ENEMIES
AMMO
OBJECTIVE

Core Gameplay

Core Gameplay

Core Gameplay

Teamwork

What Worked

- Dynamics
- Pacing
- Space for gameplay

In Conclusion...

Aubrey Serr
12 East Games
@AubreySerr

Talks Referenced:

- **Embracing Push Forward Combat in DOOM** (www.youtube.com/watch?v=2KQNpQD8Ayo)
- **Level Building for Stealth Gameplay** (www.gdcvault.com/play/1013211/Level-Building-for-Stealth)
- **Level Design in Hitman: Guiding Players in a Nonlinear Sandbox** (www.youtube.com/watch?v=hc8_W2PERZE)