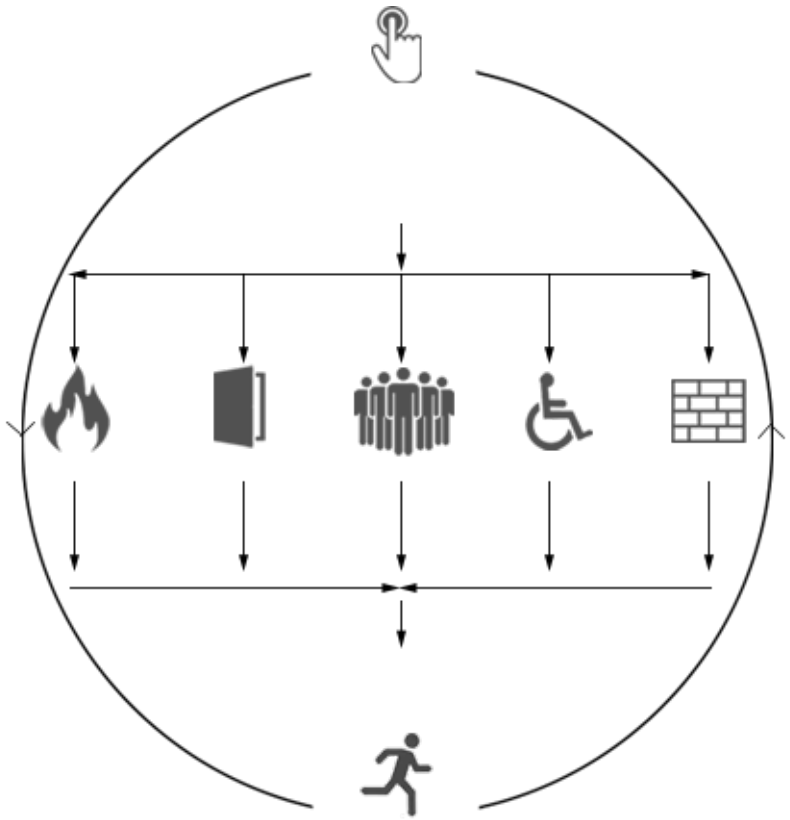
INTERACTIVE REAL TIME SIMULATION

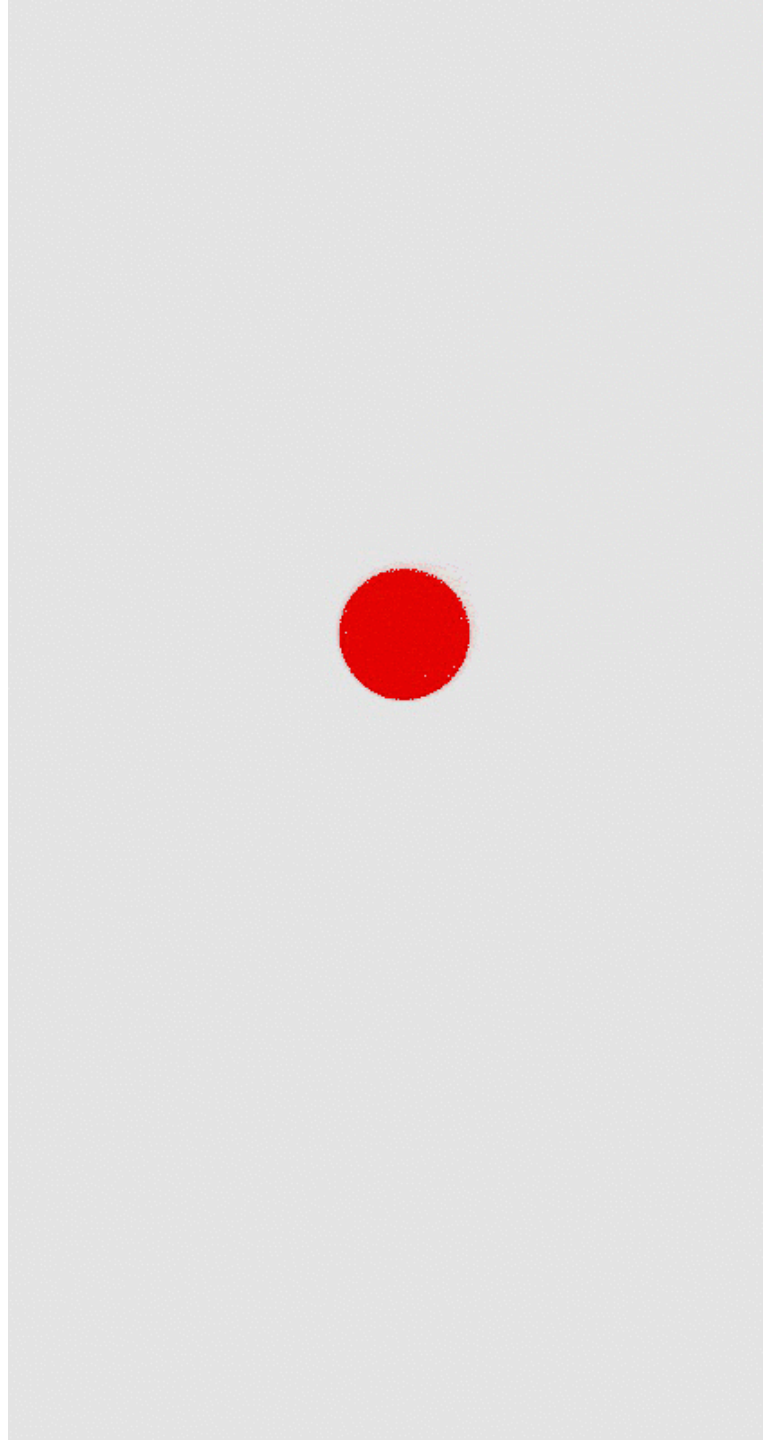
Eden li

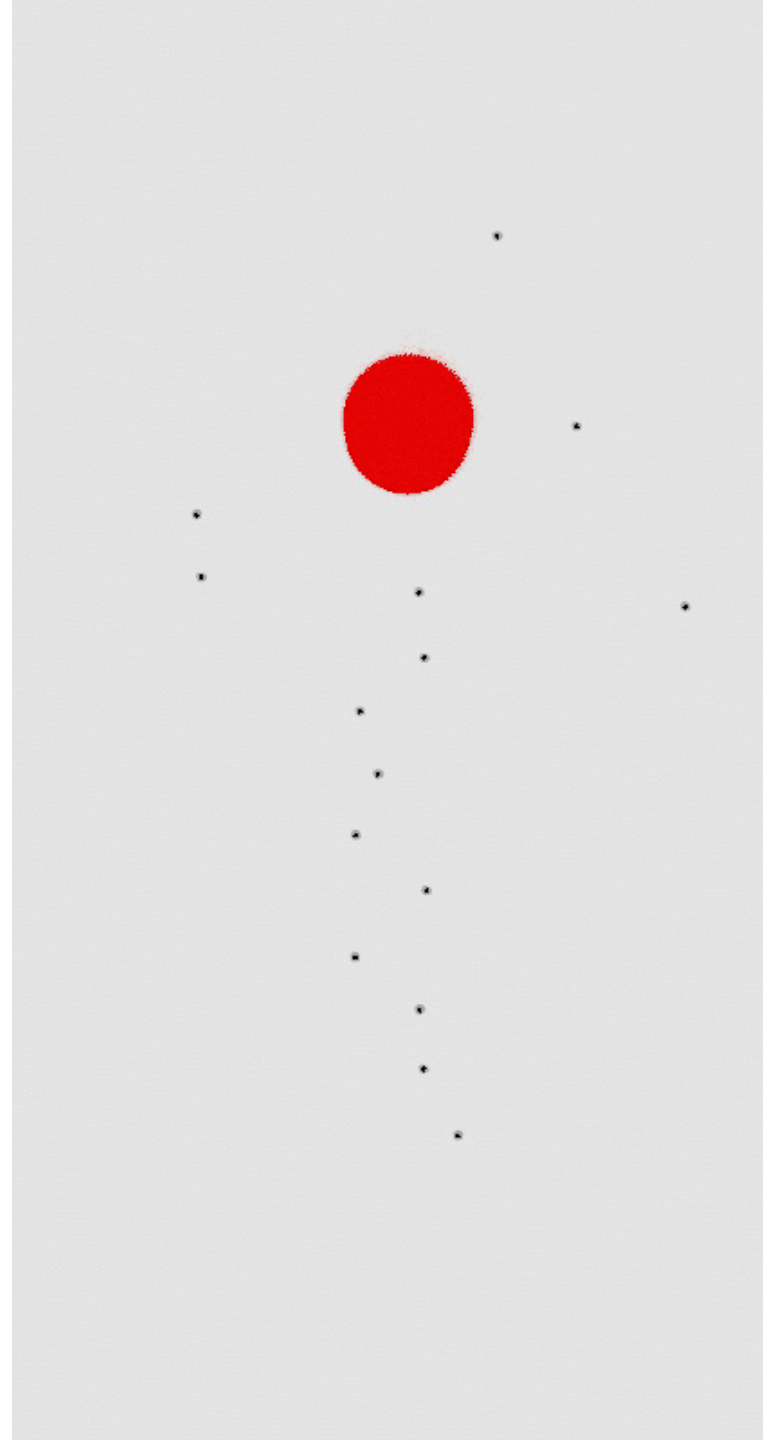
bim consulting



MY PROJECT

In what ways can real-time interactive simulations be developed for use in wayfinding design decisions?

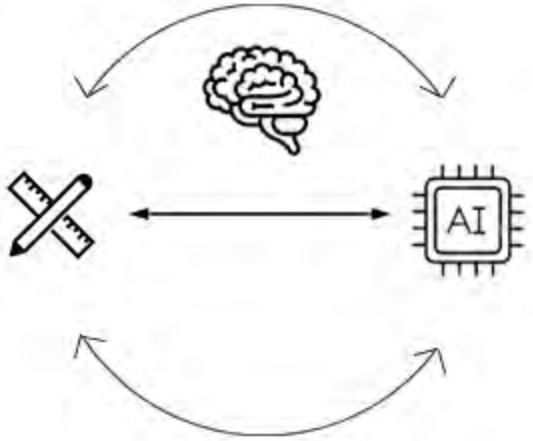




OBJECTIVES

Current

My Project



WHY?

MAYA

MASS
MOTION

BENTLEY

Existing

“Task feedback benefited learning, partially due to its effects on error detection and correction skills” (Goodman, 1998)

Rhinoceros

MODELING
TEXTURING

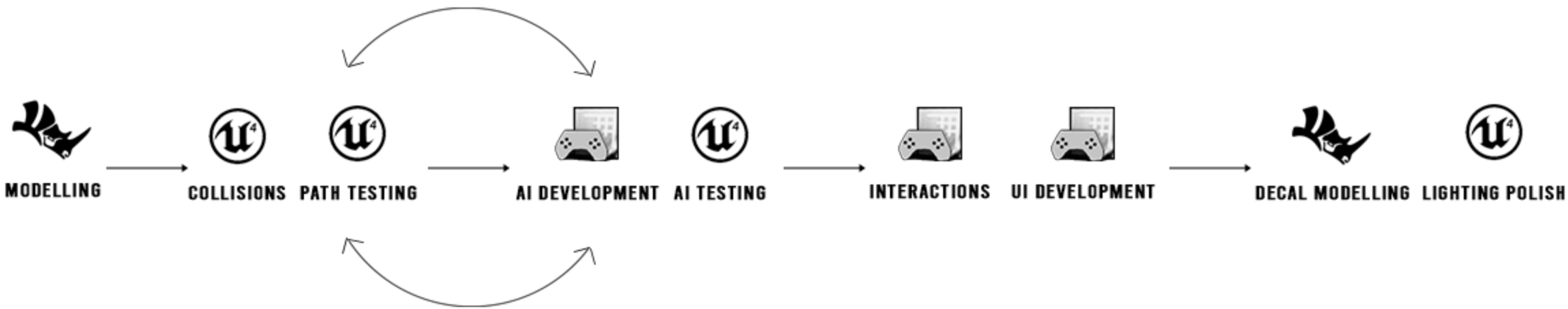
UNREAL
ENGINE

MATERIALS
COLLISION
IMPORT

BLUE PRINT

AI/ AGENT
INTERACTION

WORKFLOW

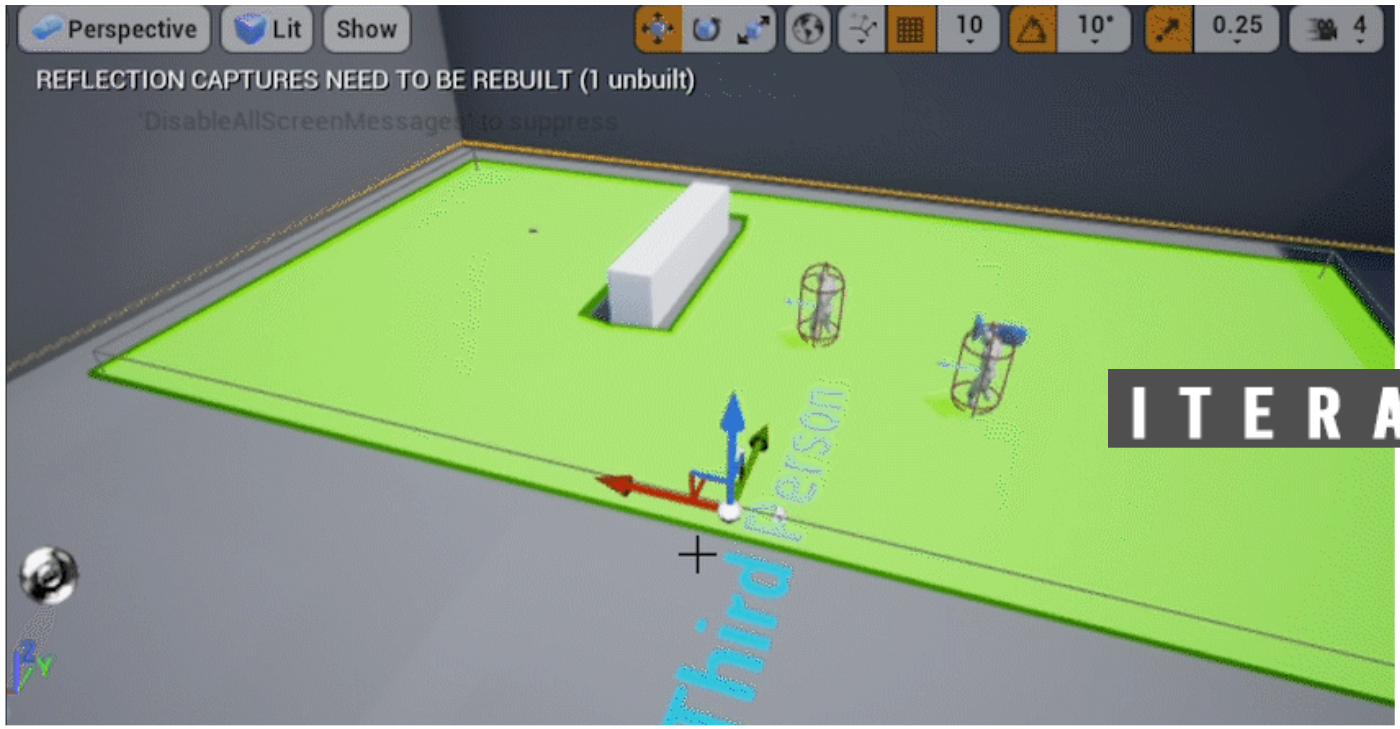


L E A R N T

- AI MOVEMENT
- NAV MESH
- GOAL BASED MOVEMENT

P R O B L E M S

- SIMPLE MOVEMENT
- SINGULAR SCRIPT



I T E R A T I O N 1

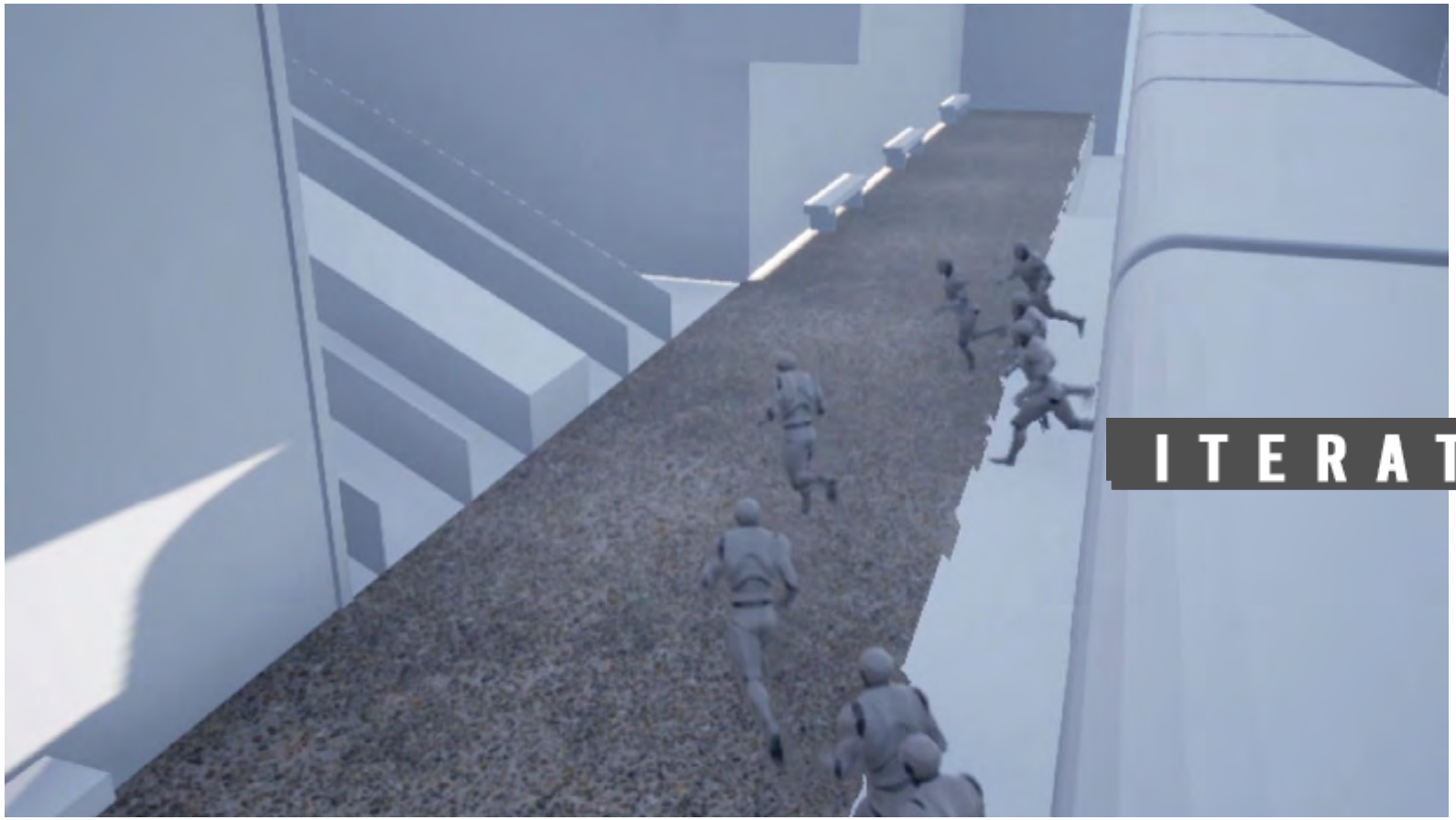
P A T H I N G

LEARNT

- AI PATHING
- COLLISION AVOIDANCE

PROBLEMS

- BUNCHING FAILURE
- BASIC PATHING
- NO DIVERSITY
- NO PURPOSE



ITERATION 2

CONTEXT

LEARNT

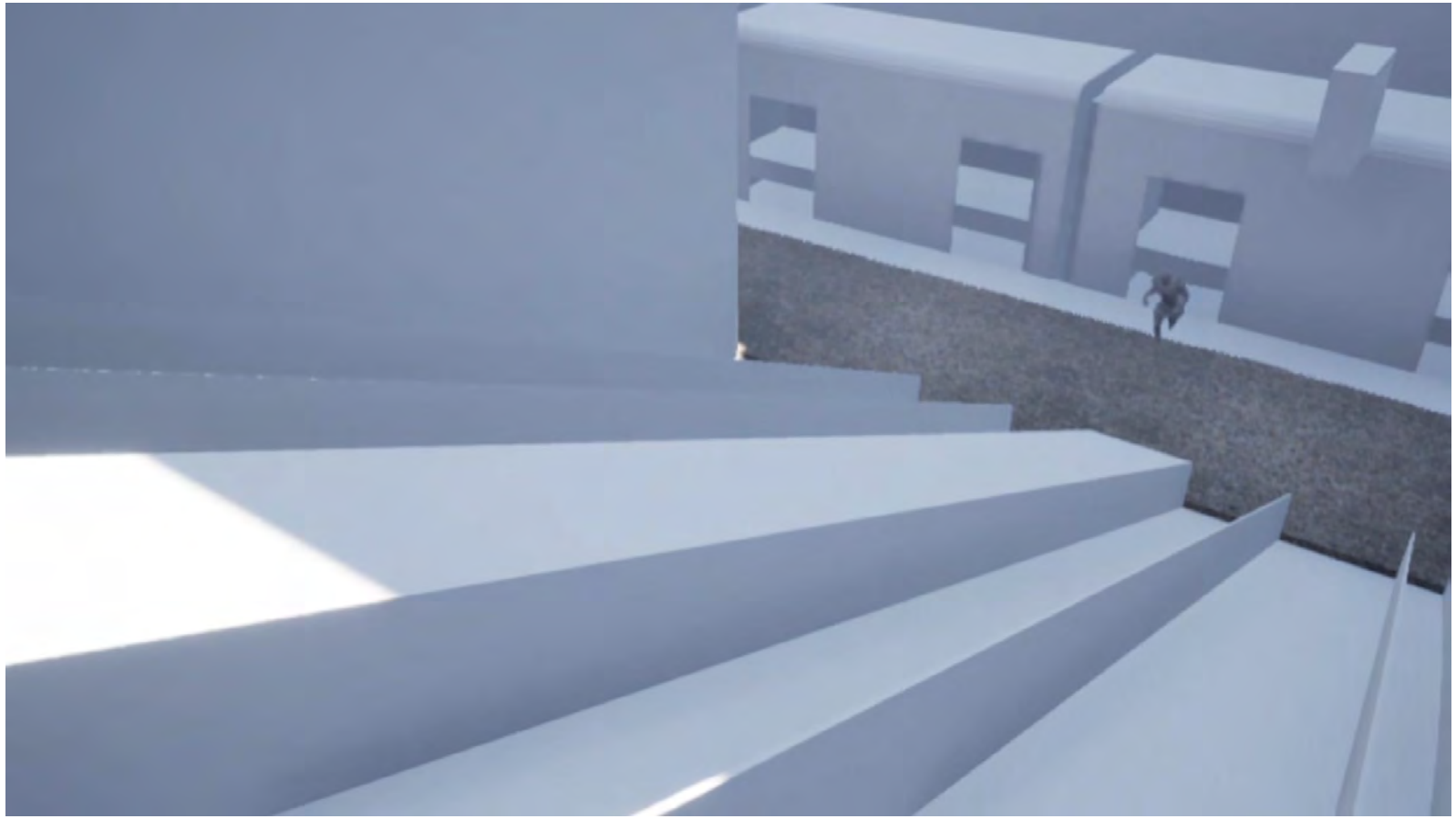
- CHANGE WALL TYPE
- LIVE PATH ALTERATION
- SPAWNER
- LIVE COLLISIONS

PROBLEMS

- WALL DETECTION
- SPECIFIED WALLS ONLY

ITERATION 3

LIVE CHANGES



ITERATION 4

DYNAMIC SCENE

LEARNT

- DYNAMIC SCENE
- TRUE INTERACTION
- SCENE VARIABLE

PROBLEMS

- AI DOESNT DETECT IT
- FLOW PROBLEMS

LEARNT

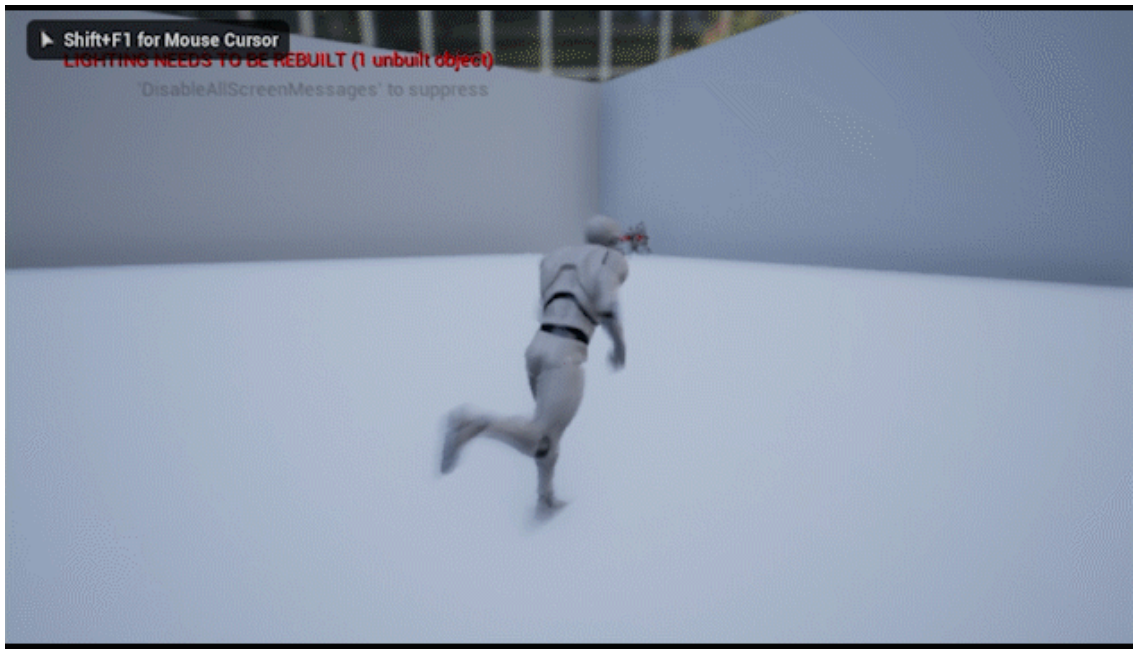
- PLACING OBJECTS
- LIVE REPATHING
- LIVE REACTION

PROBLEMS

- UI IS HARD TO USE
- NO MOUSE FREEDOM

ITERATION 5

LIVE INTERACTION



LEARNT

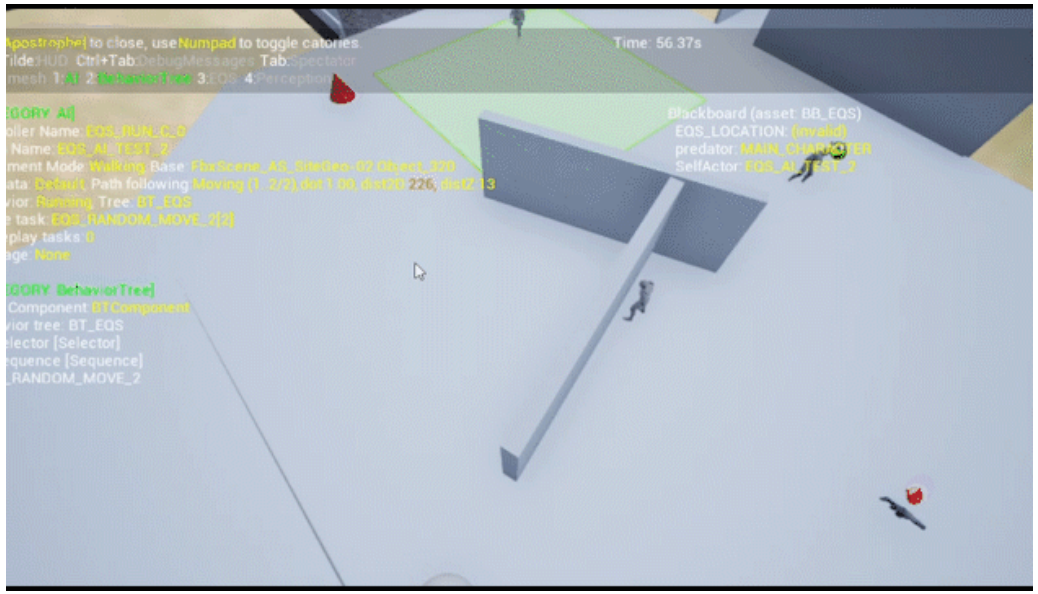
- PLACING OBJECTS
- LIVE REPATHING
- LIVE REACTION

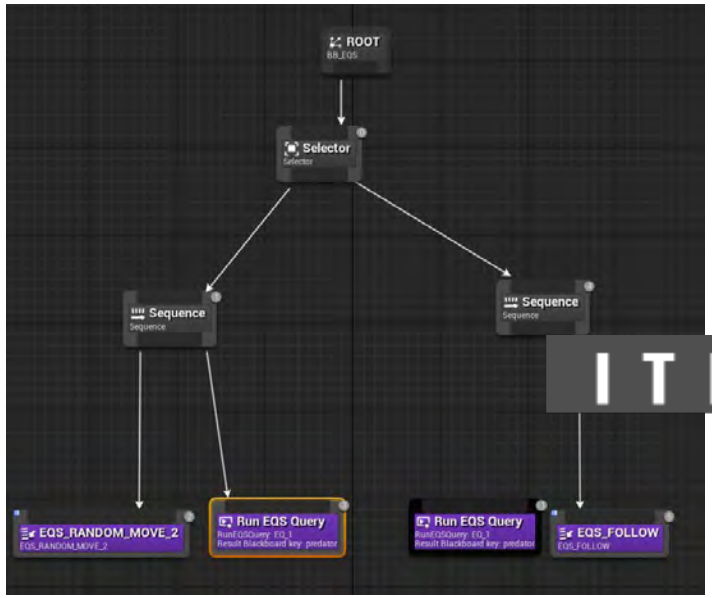
PROBLEMS

- UI IS HARD TO USE
- NO MOUSE FREEDOM

ITERATION 5

LIVE INTERACTION





ITERATION 6

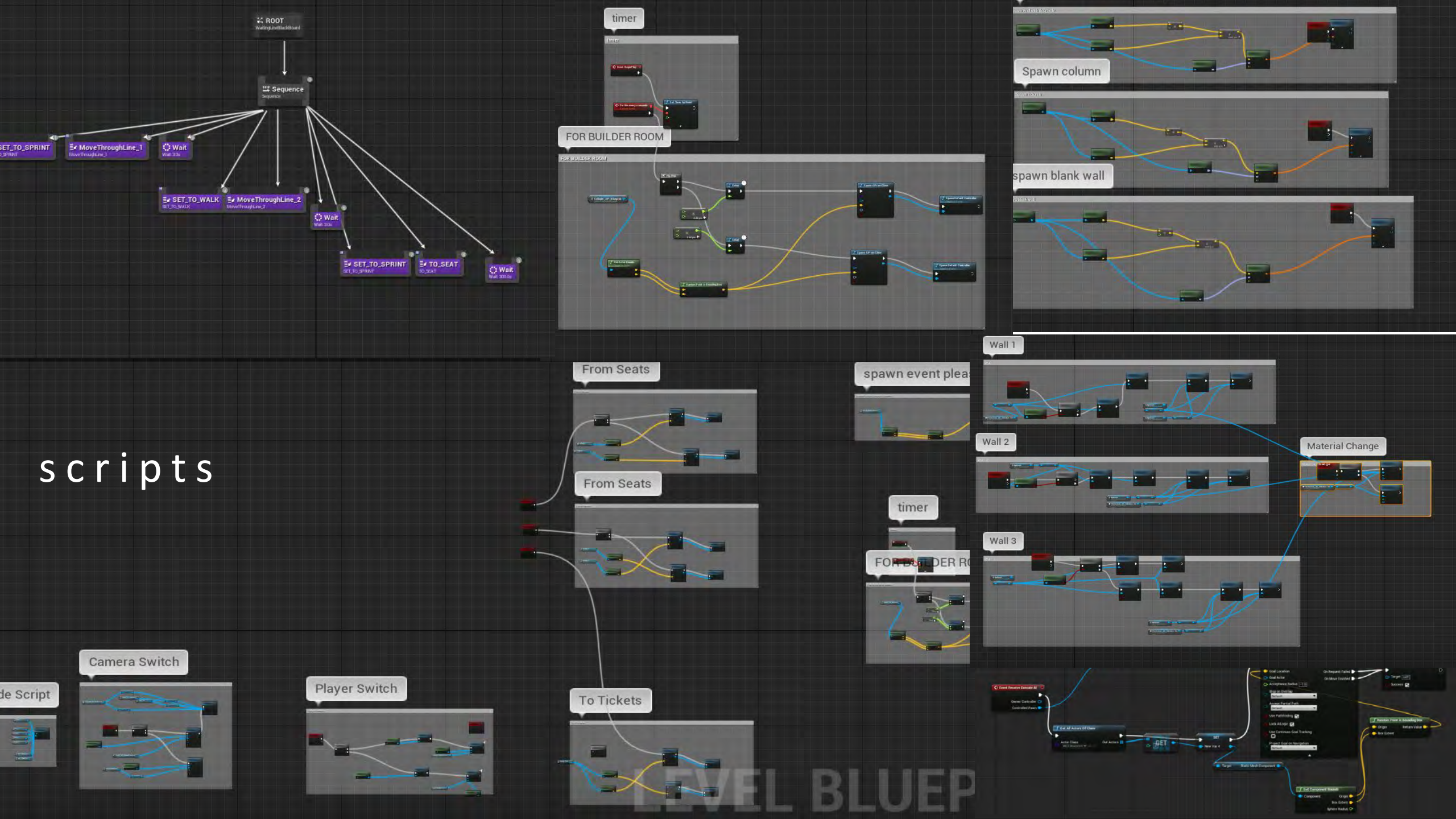
ADVANCED AI

LEARNT

- DIVERSE DECISIONS
- PERCEPTION
- REACTION

PROBLEMS

- NOT OPTIMISED
- NEW SYSTEM


ROOT
Sequence
SET_TO_SPRINT
MoveThroughLine_1
Wait
SET_TO_WALK
MoveThroughLine_2
Wait
SET_TO_SPRINT
TO_SEAT
Wait
timer
FOR BUILDER ROOM
Spawn column
spawn blank wall
From Seats
From Seats
spawn event plea
timer
Wall 1
Wall 2
Material Change
Wall 3
scripts
Camera Switch
de Script
Player Switch
To Tickets

Final product

Observer mode

Final product

Interactive mode

PROS/ SUCCESSES

- Created a crowd that reacts to the scene and user elements
- Live reactions and simulations
- Easy to understand interface
- Encourages usability and exploration

CONS/ IMPROVEMENTS

- Scene needs some tweaking before simulation can be run
- Ai still doesnt mimic human traits very well
- UI needs further development

WHAT IVE LEARNT SO FAR?

IF I HAD MORE TIME

DATA EXPORT
- Pathing data
- People count
- Frequency diagram
- Geometry

USER TESTING
- See how it informs decisions
- Validity and reliability of system

DIVERSITY
- Add more profiles
- True personalities

OPTIMAL STATE

DUALITY SYSTEM
- Design whilst simulating
- Encourages design decisions
- Validates choices
- Saves times

RELIABLE AI
- True human behaviour
- Multiple considerations of context

AUTONOMOUS SCENE SET UP
- No time wasted in setup
- AI recognises doorways

FUTURE?

In what ways can interactive simulations be developed for use in wayfinding design decisions?

SUCCESSFUL?

PROBLEMS

RELEVANT?

REPRODUCABLE?

POTENTIAL?

CONCLUSION