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FRIDAY THE 13TH

AI
TAG

Powered by object detection and reinforcement learning

What is Friday 13th AI Tag

Our agents

_____

Our ambients

- Jason
- Victim
- Camp
- Houses

SLIDE 1
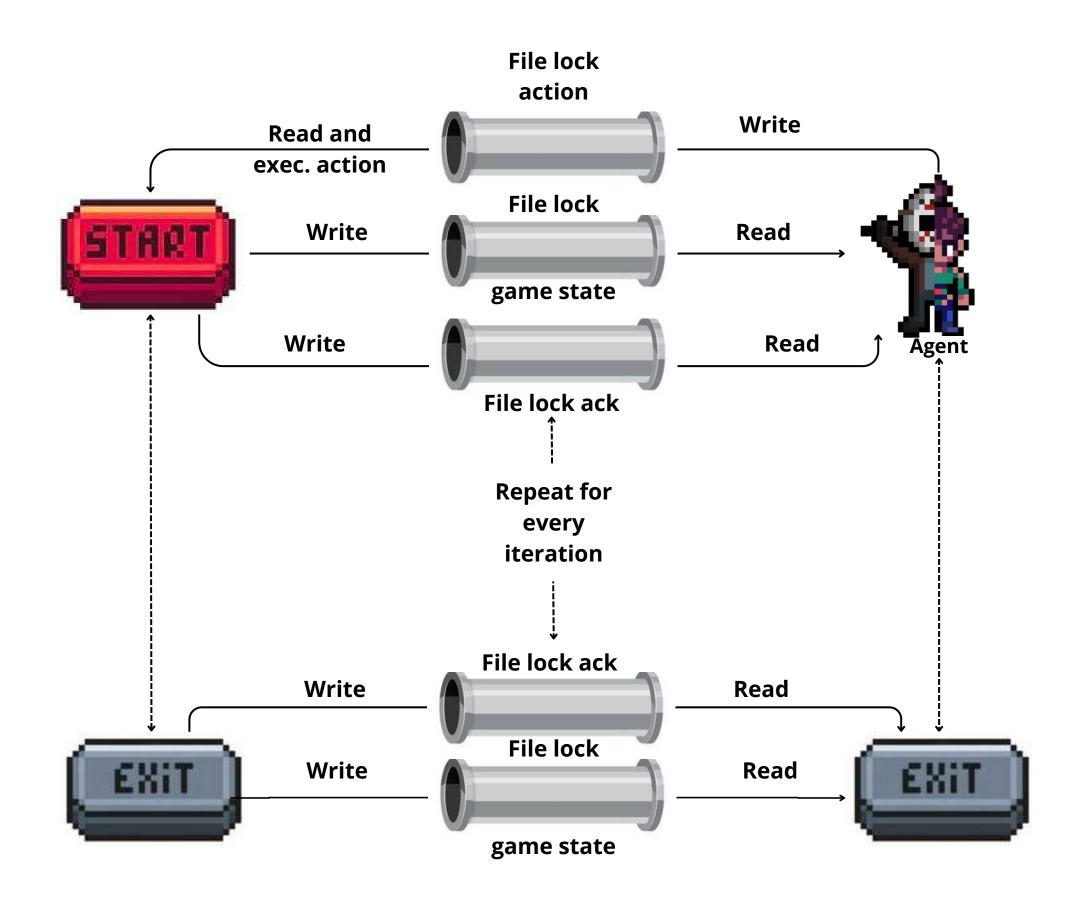
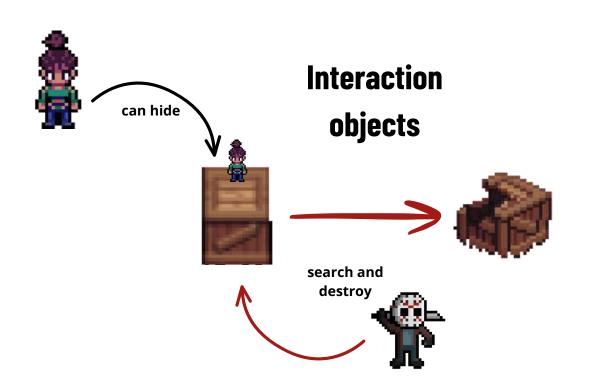# HOW IT WAS BUILT

- JAVA ENGINE TO HANDLE THE ENVIRONMENT
- PYTHON FOR TRAINING
- FILE LOCK AS C-PIPE
- ENFORCE SEQUENTIALITY

SLIDE 2

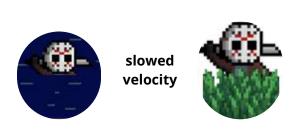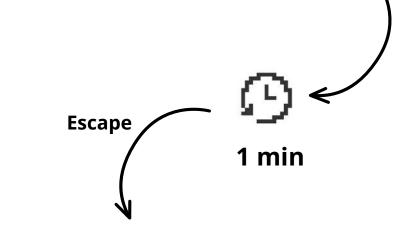# WHAT IS THE PURPOSE

PARTIALITY OF OBSERVATION

VARIETY OF STATES

- DYNAMIC ADAPTATION
- GENERALIZATION
- EVOLVING BEHAVIOUR
- CONTEXTUAL AWARENESS?

COMPETITIVE AND ASYMMETRICAL NATURE
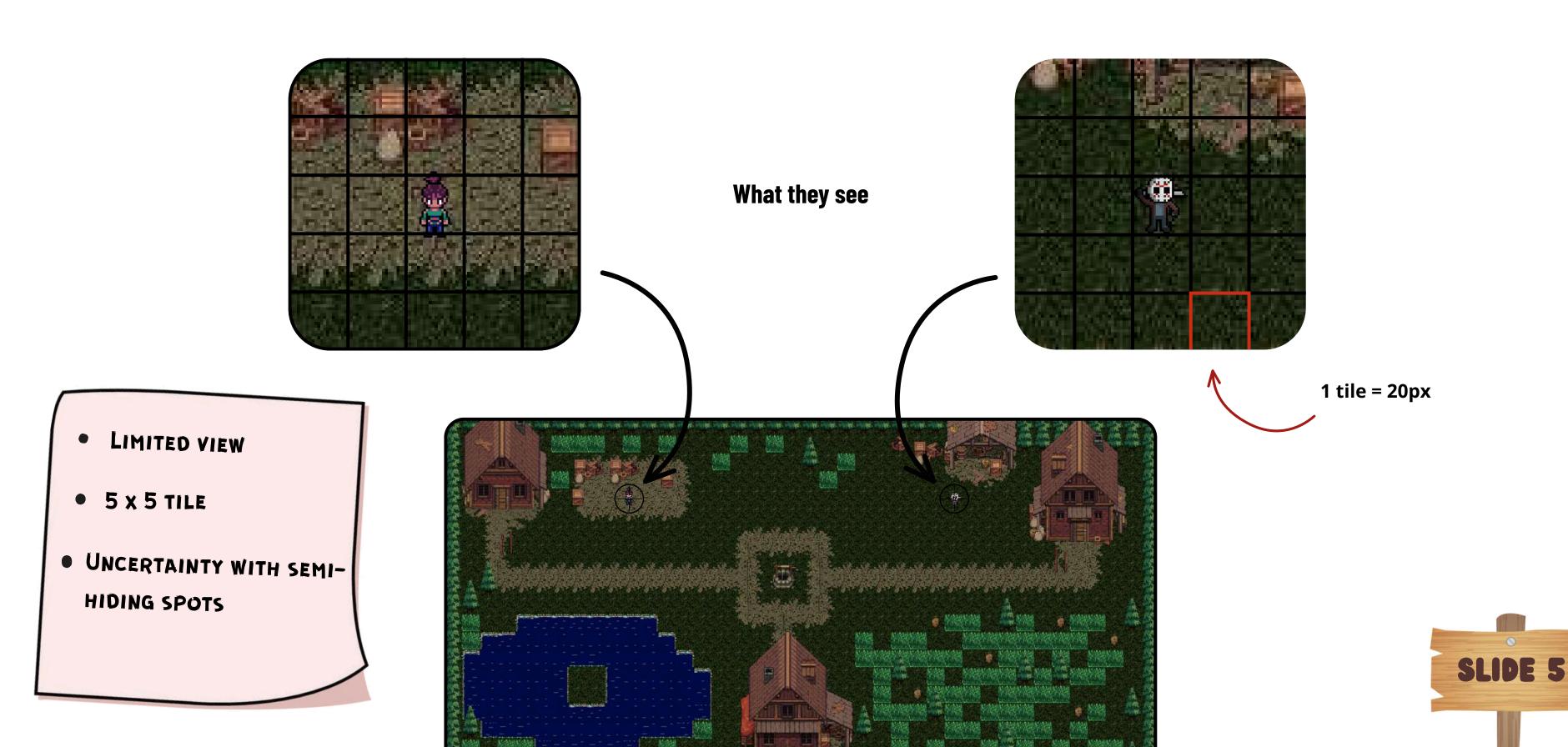
NON STATIONARY DINAMICS

SLIDE 4
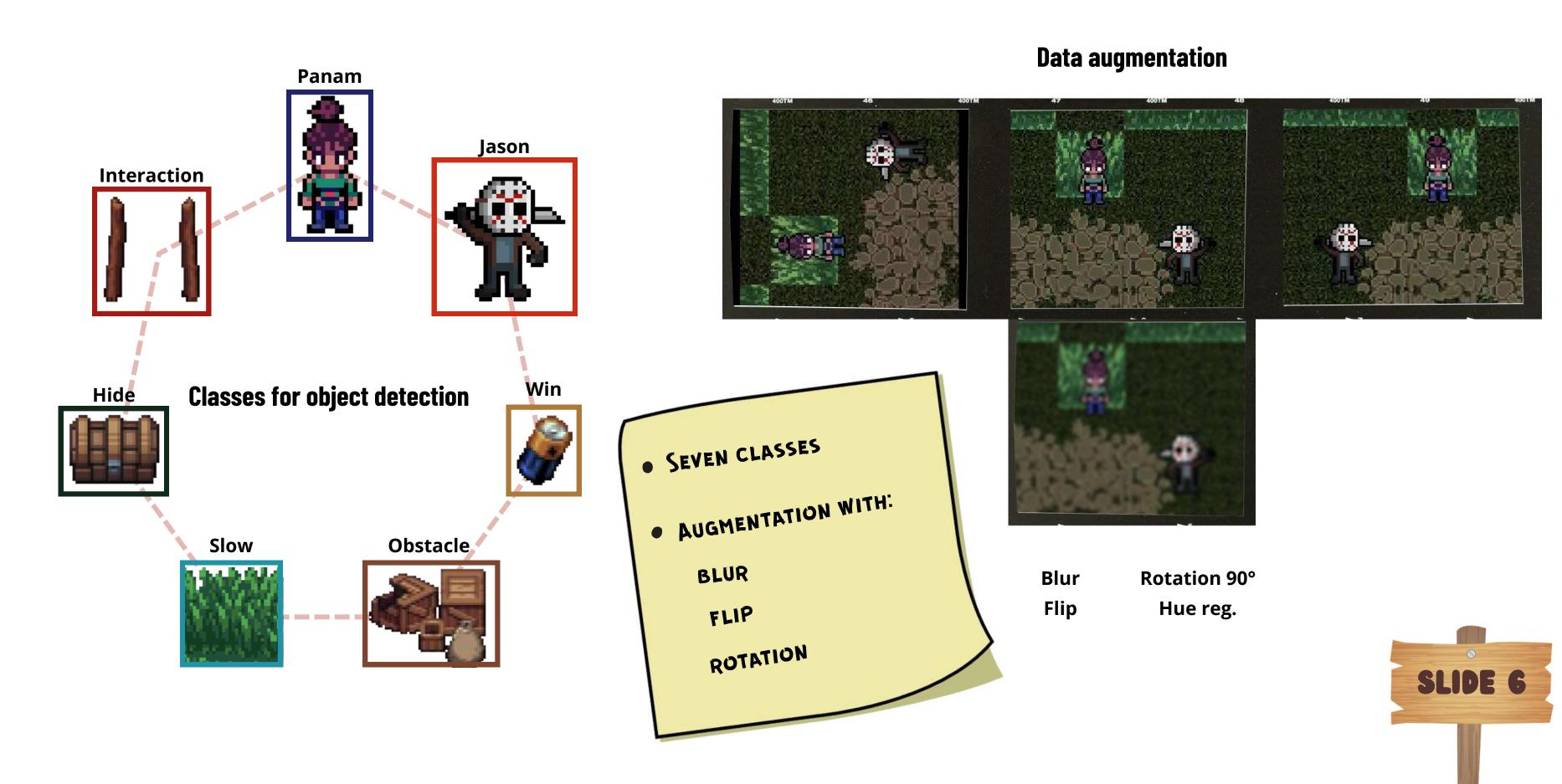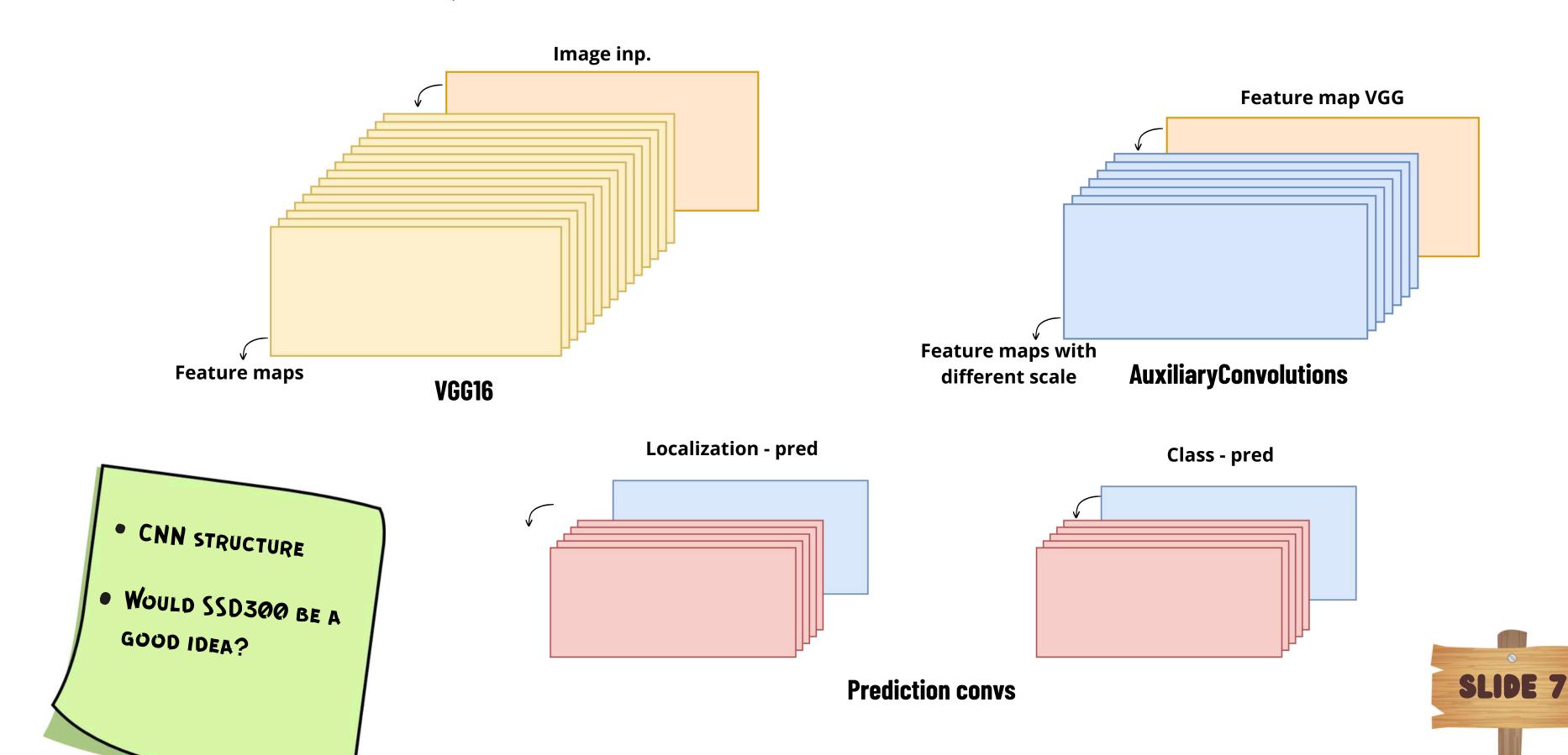
How the agents see the world
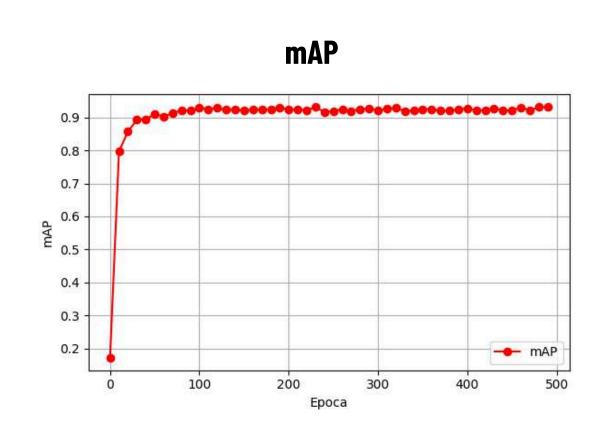

What they see

1 tile = 20px

- Limited view
- 5 x 5 tile
- Uncertainty with semi-hiding spots

How the data where crafted

Data augmentation

Classes for object detection

Interaction

Panam

Jason

Hide

Win

Slow

Obstacle

- Seven classes

- Augmentation with:

  Blur

  Flip

  Rotation

Blur   Rotation 90°
Flip   Hue reg.

SLIDE 6

How the network was made

Image inp.

Feature maps

VGG16

Feature map VGG

Feature maps with different scale

AuxiliaryConvolutions

- CNN structure
- Would SSD300 be a good idea?

Localization - pred

Class - pred

Prediction convs

SLIDE 7

How the agents eyes were trained

mAP

Predictions

Loss

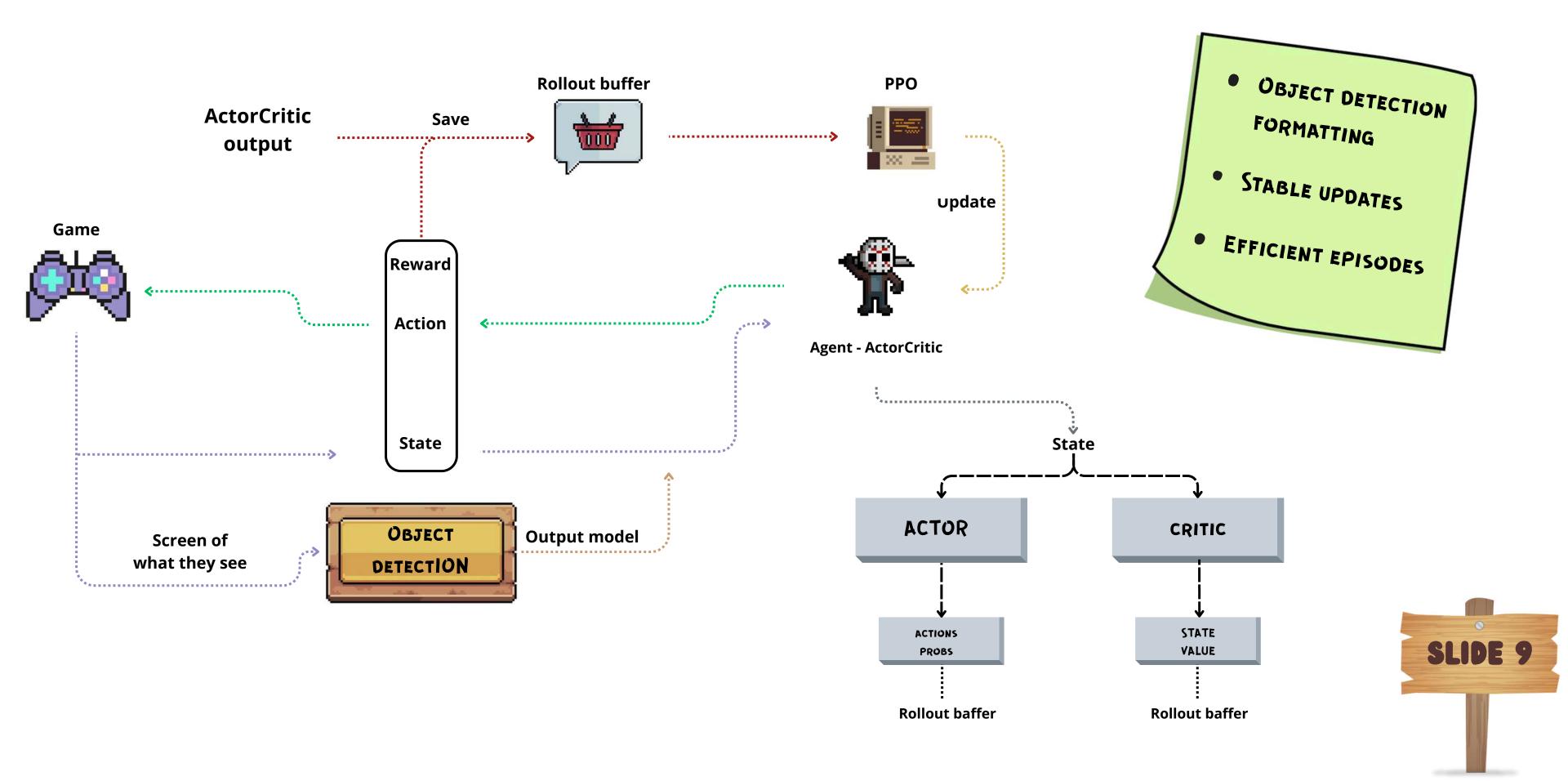Dataset → Epoch = 500 / Only train → Neural network (Batch = 8) ⇄ mAP / Validation
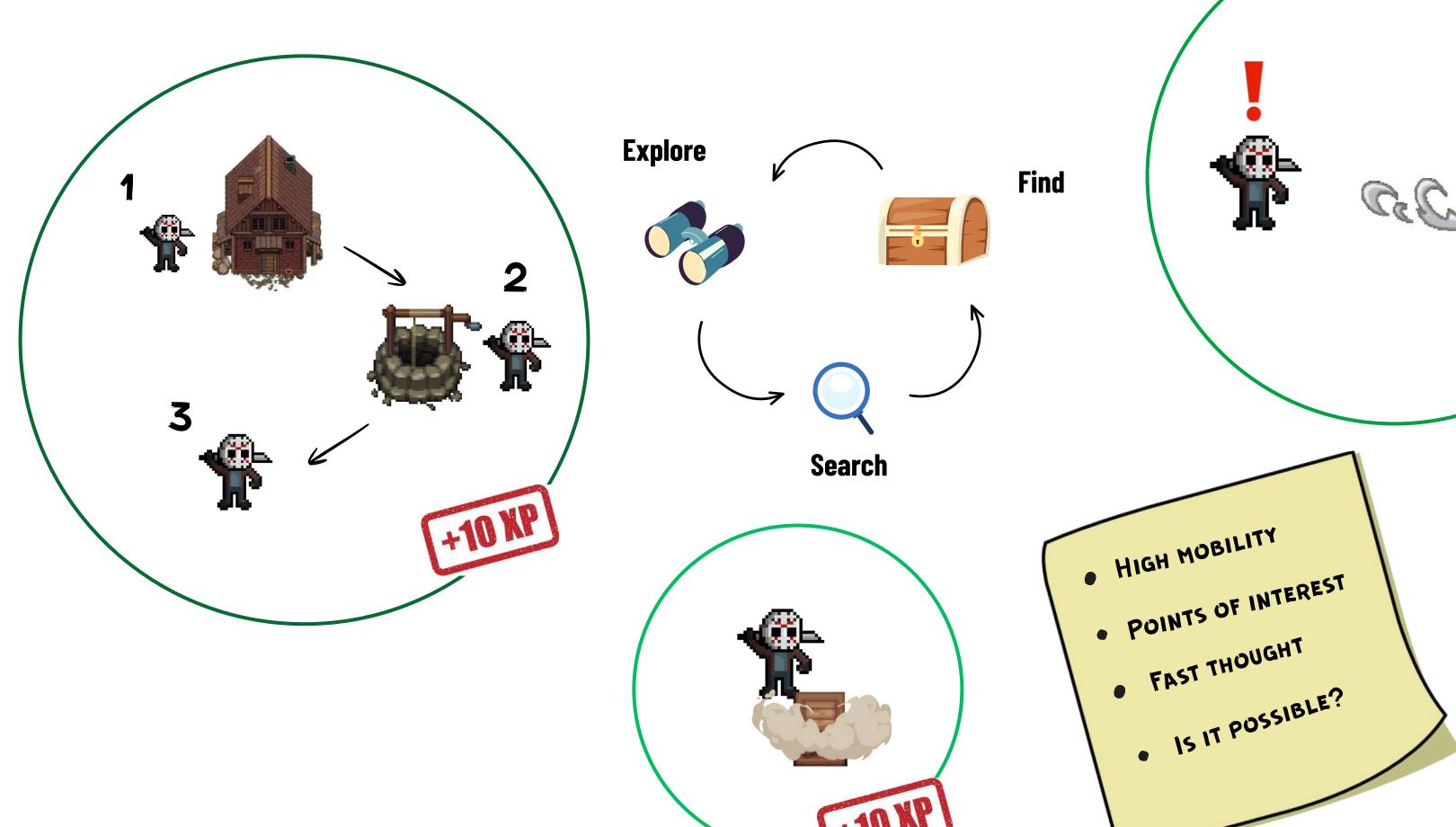
- Wrong dataset?
- Wrong model?
- Fast enough?

SLIDE 8
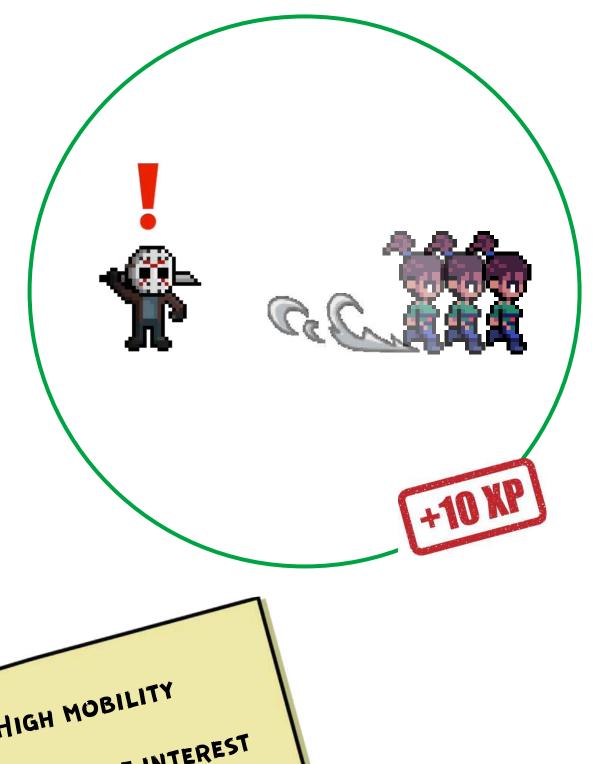
How the killer gets rewarded

Explore · Find · Search

+10 XP

+10 XP

+10 XP

- High mobility
- Points of interest
- Fast thought
- Is it possible?

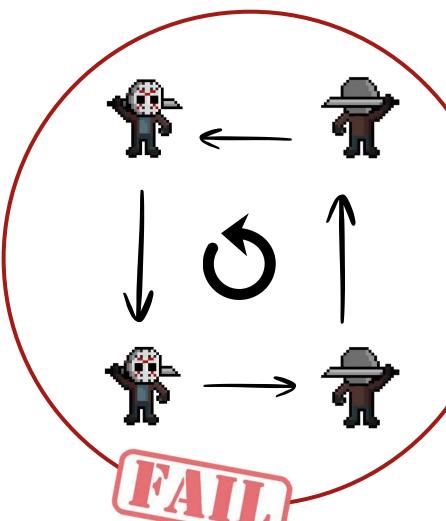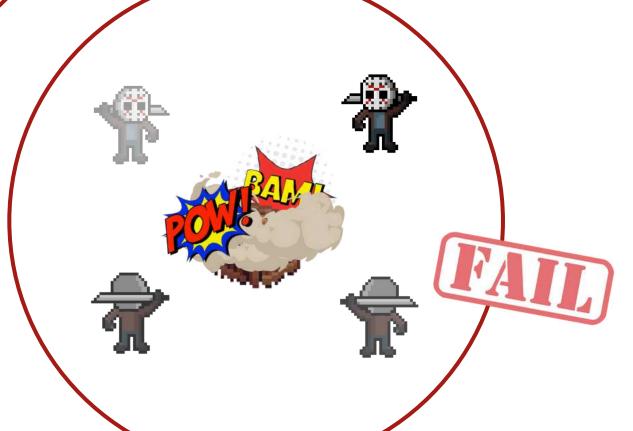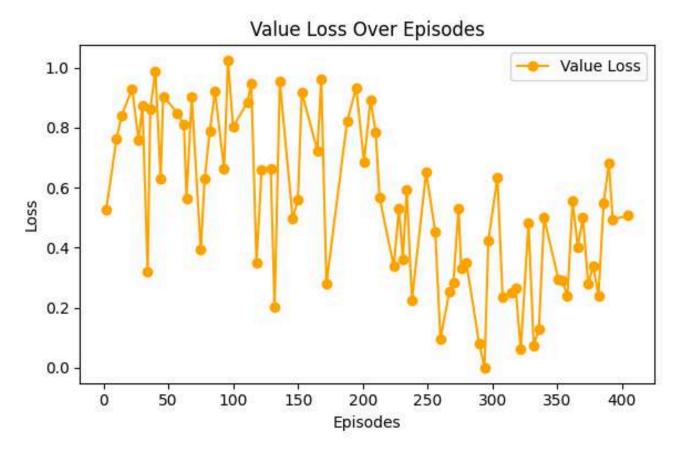# How the killer was trained

Reward Shaping

- Reward exploitation
- Greedy behaviour
- Need to fix rewards
- Use a strong incentive?

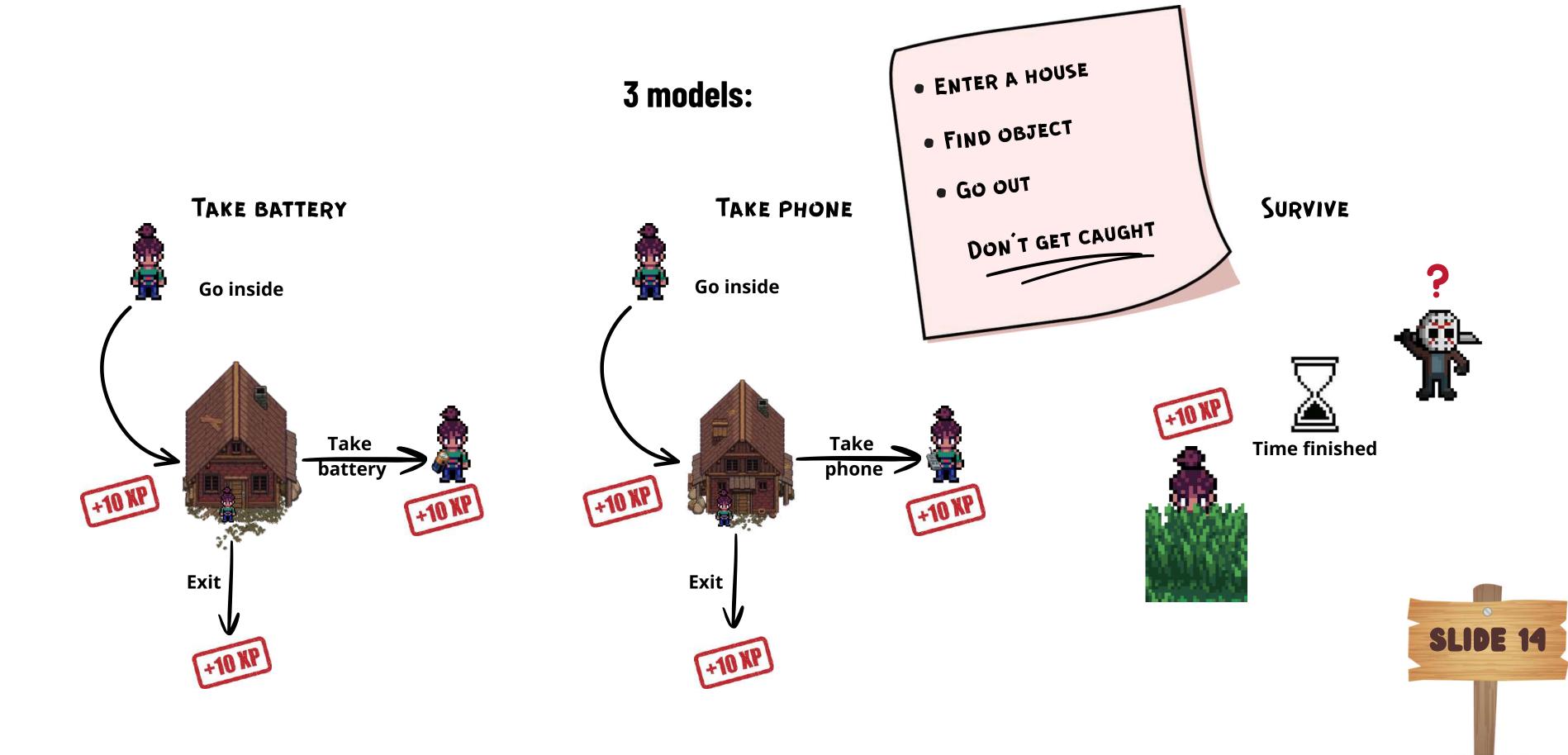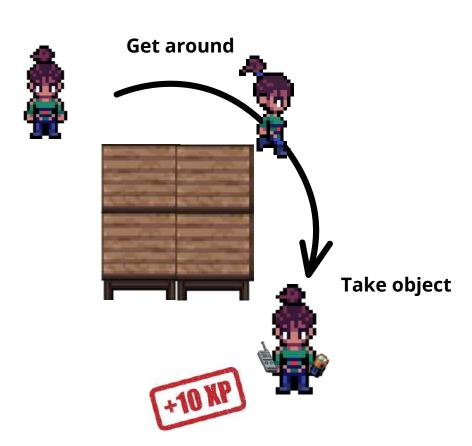SLIDE 11

HOW GOOD IS THE KILLER

Value Loss Over Episodes

- Good value loss?
- Policy stabilization?
- It was only a bad episode?

Anyway it works

Policy Loss Over Episodes

SLIDE 12
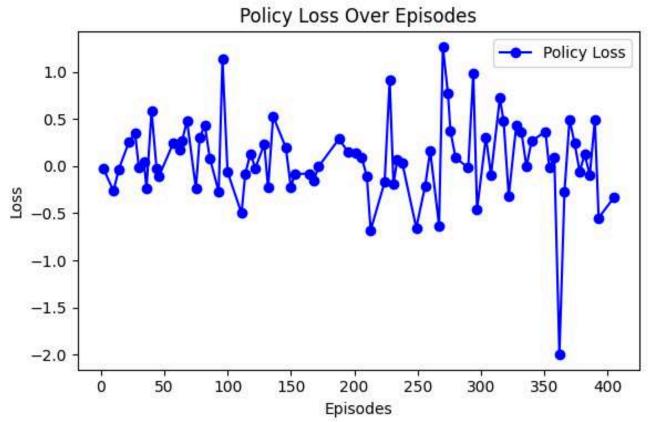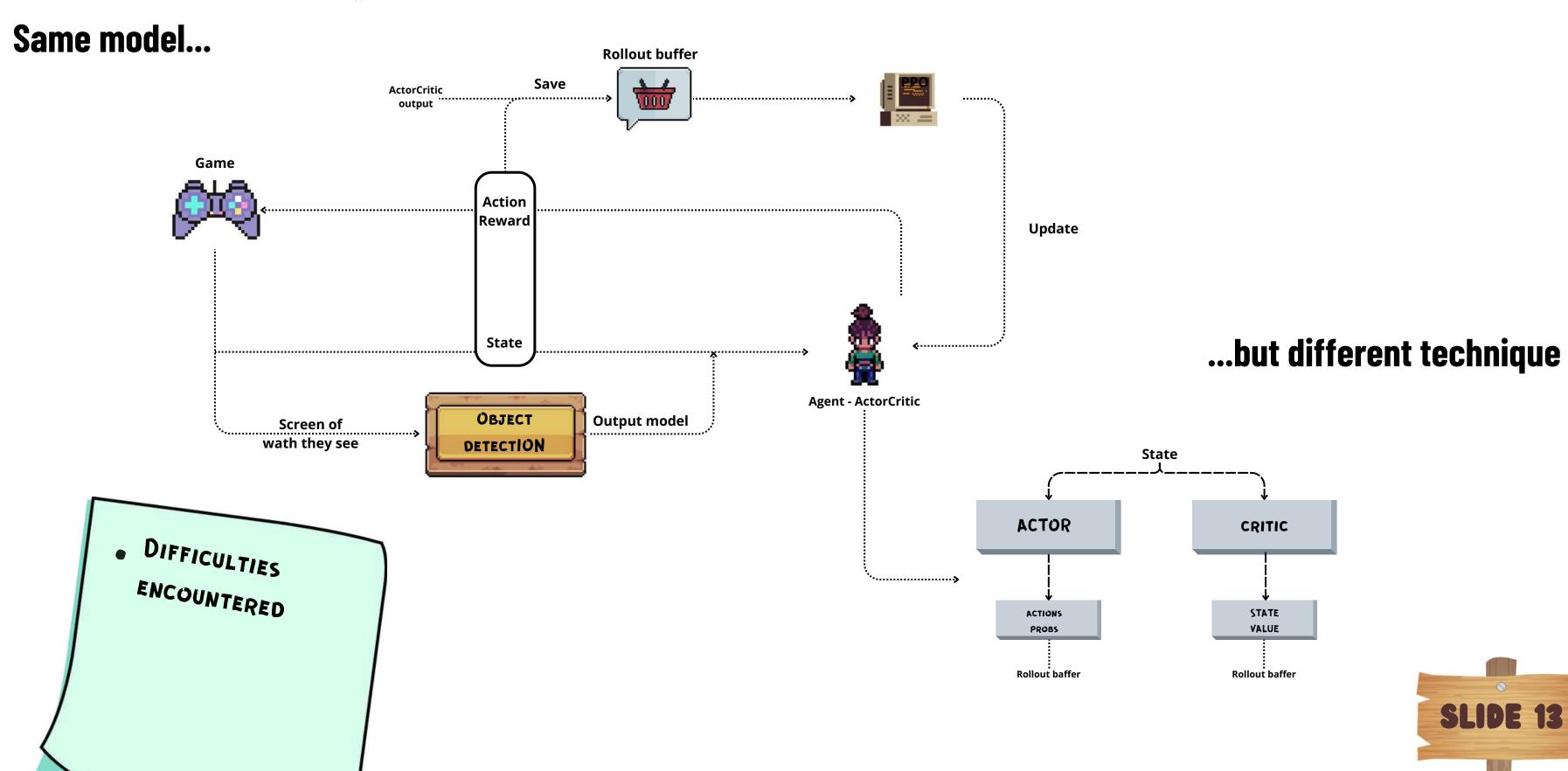
HOW THE VICTIM GETS REWARDED

3 models:

- ENTER A HOUSE
- FIND OBJECT
- GO OUT

DON'T GET CAUGHT

TAKE BATTERY

Go inside

Take battery

+10 XP

+10 XP

Exit

+10 XP

TAKE PHONE

Go inside

Take phone

+10 XP

+10 XP

Exit

+10 XP

SURVIVE

+10 XP

Time finished

?

SLIDE 14
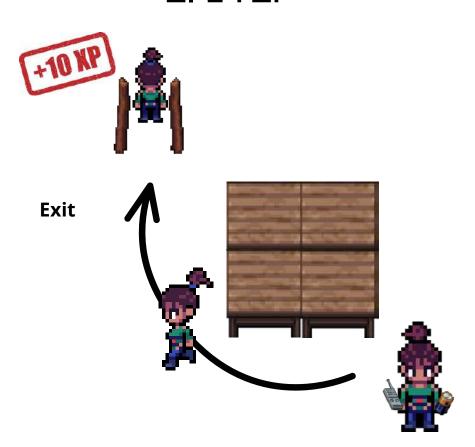
How the victim was trained

Curriculum learning
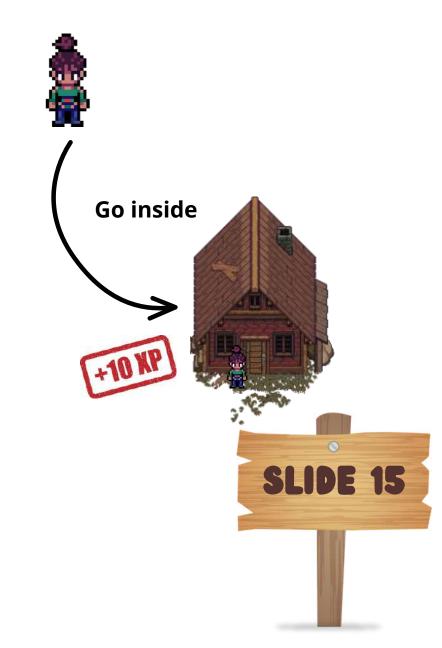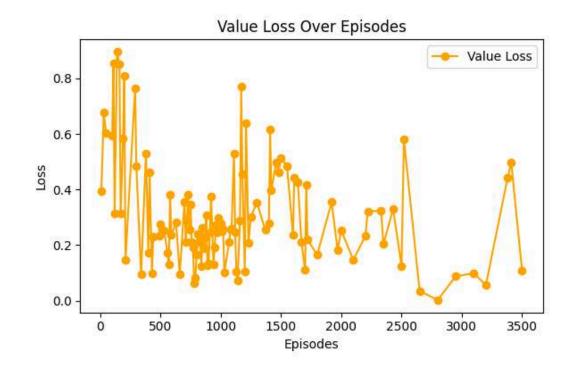
How good is the victim

Value Loss Over Episodes

SPAWNING POINTS

- Good value loss?
- Different spawning points
- Why the peaks?
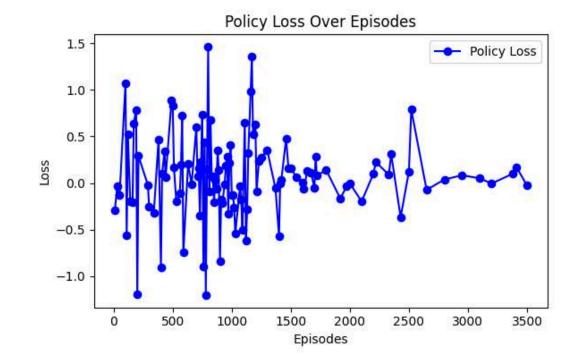
Policy Loss Over Episodes
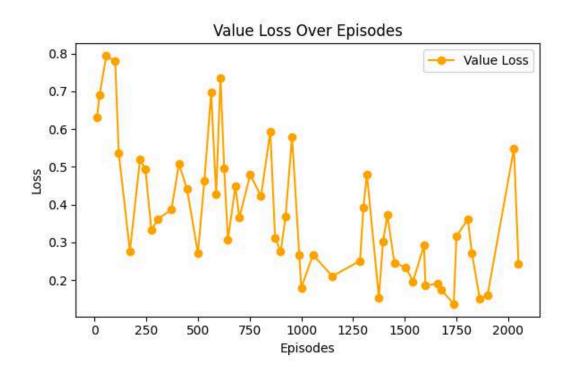
1. BATTERY

HOW GOOD IS THE VICTIM

Value Loss Over Episodes
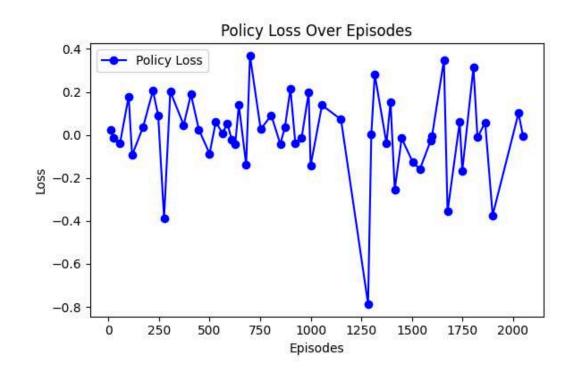
- Good value loss?
- different spawning points
- Why the peaks?

2. PHONE

Policy Loss Over Episodes

SLIDE 16.2

HOW GOOD IS THE VICTIM

Value Loss Over Episodes

Policy Loss Over Episodes

- KILLER SWP
- VICTIM SWP

3. SURVIVE

- GOOD VALUE LOSS?
- DIFFERENT SPAWNING POINTS
- WHY THE PEAKS?

SLIDE 16.3