



Machine Learning for Video Game Development

2022 May World Summit AI

Konrad Tollmar
Research Director EA

Electronic Arts



STAR WARS
SQUADRONS
EA

EA SPORTS **FIFA 21** THE ASSOCIATION OF FOOTBALL CLUBS

NEED FOR SPEED
HOT PURSUIT
REMASTERED

THE
SIMS 4

EA SPORTS **MADDEN NFL 21**

APEX
LEGENDS



Pop quiz

Did you note any AI?

SWISH: NEURAL NETWORK CLOTH SIMULATION ON MADDEN NFL 21

Old System



New System



EA // SEED

**Cross-disciplinary R&D
team. Explore the future
of interactive
entertainment.**

SEED//SEARCH FOR EXTRAORDINARY EXPERIENCES DIVISION

450m registered players



Positive Play

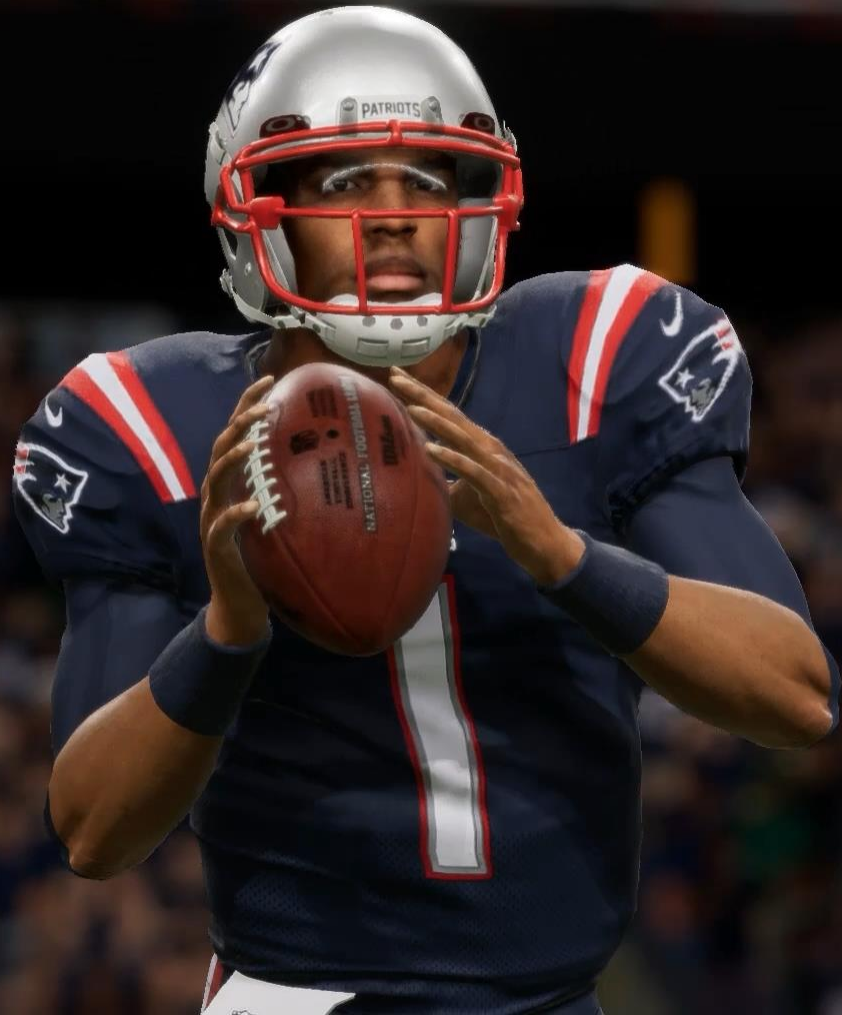
**Dont use exploits, cheats,
undocumented features, design
errors, etc**

Accessibility

Open Source Patents



ADVANCED AVATARS
End-to-End Pipeline
for Visually-
Convincing Avatars



LightStage

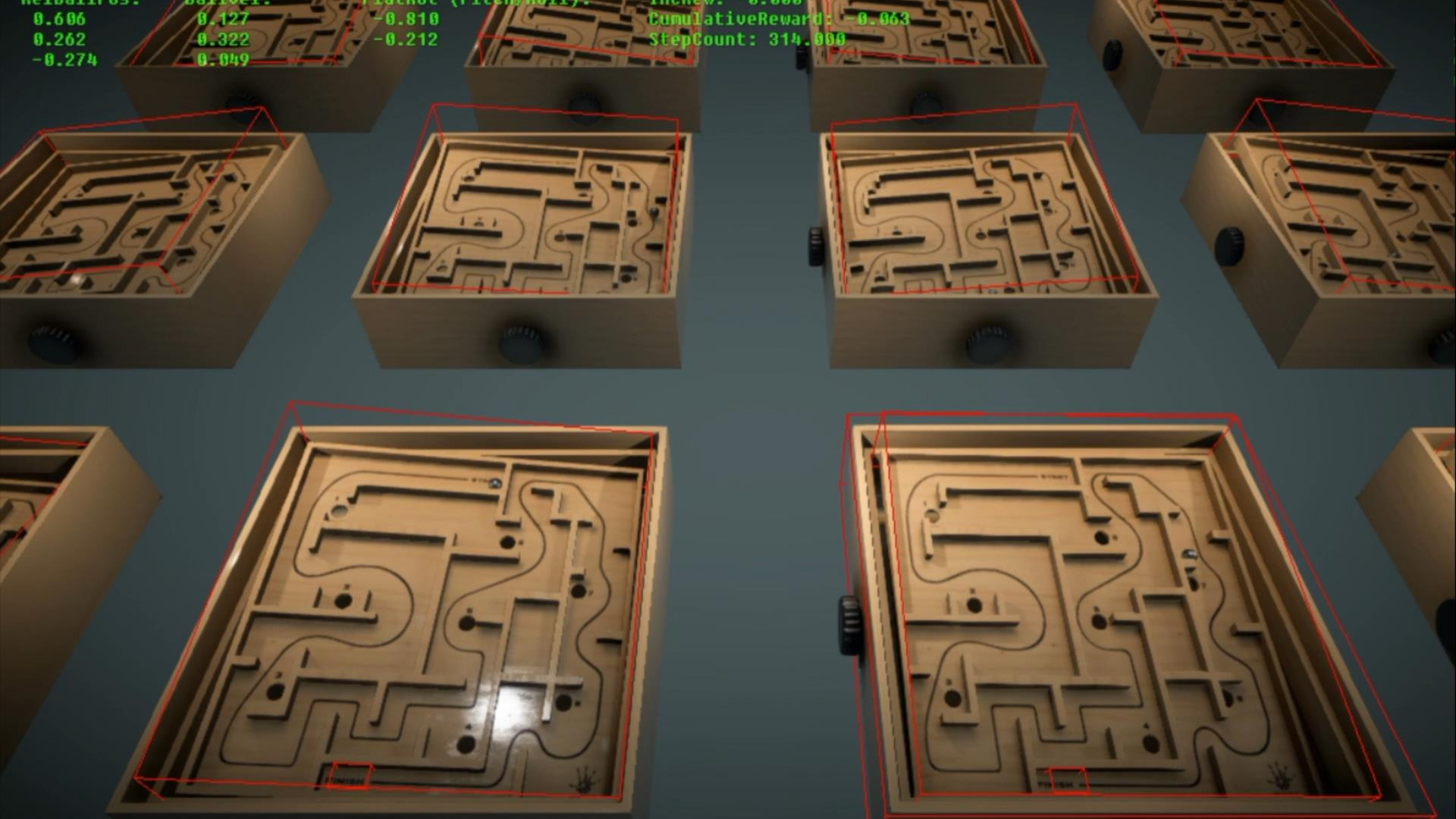
SEED // EA Studios Advanced Research





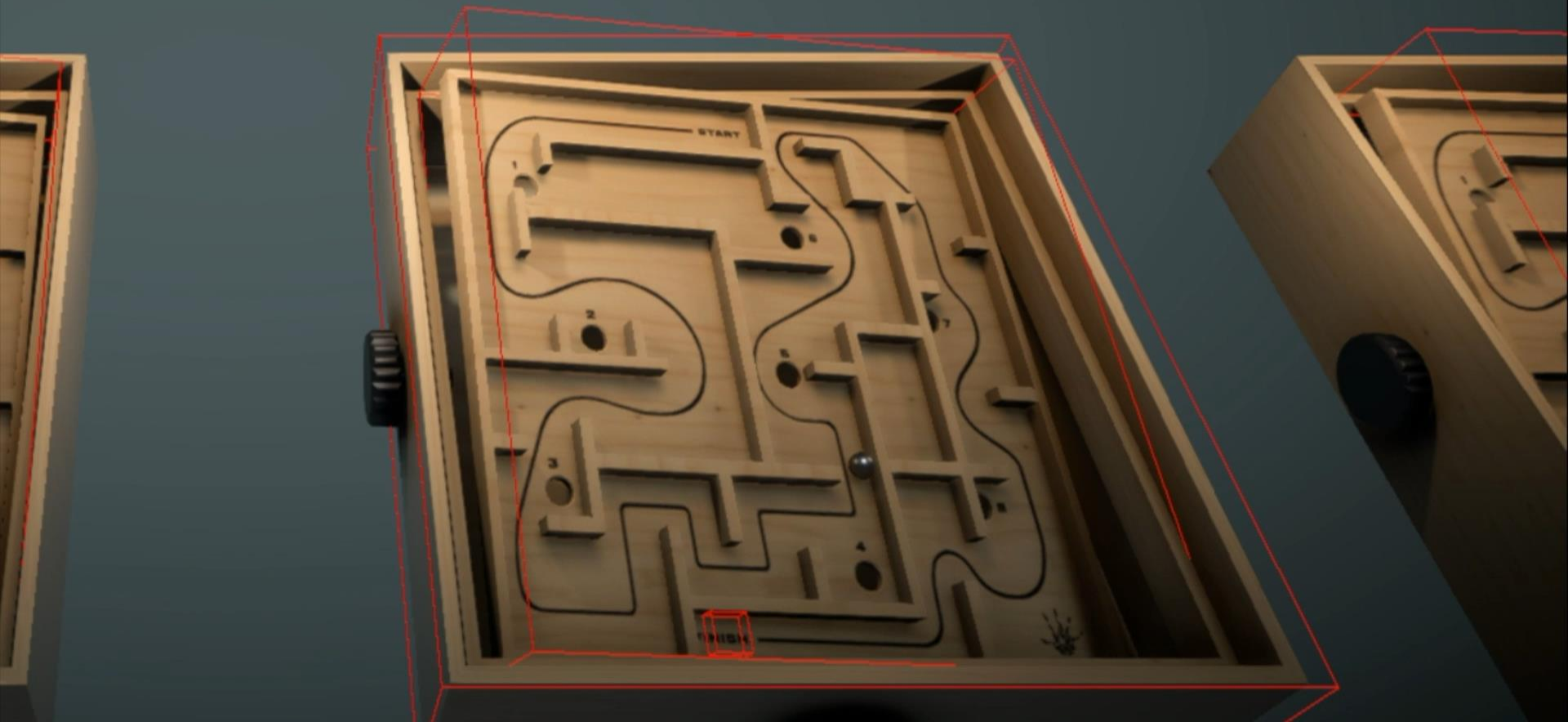
DEEP TESTING

Human-like Behavior
for improving Game
Testing



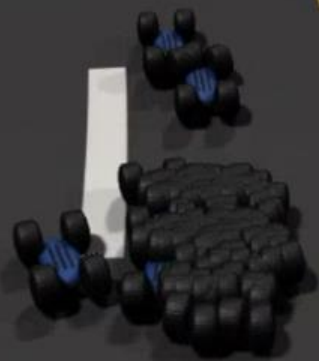
ne10811705. 0.127 0.810 0.000
0.606 0.127 -0.810 CumulativeReward: -0.063
0.262 0.322 -0.212 StepCount: 314.000
-0.274 0.049

Testing - Game mechanic exploit



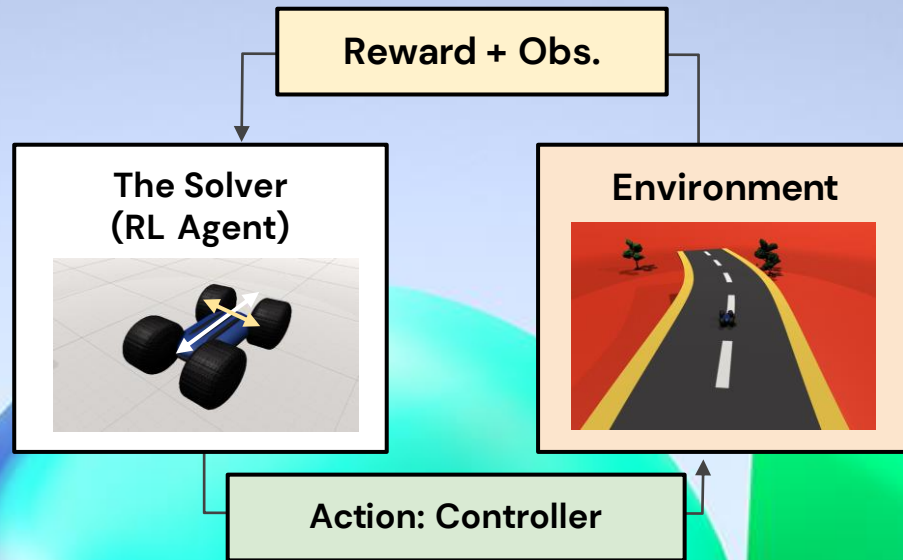
-1,0

Avg distance travelled: 7
Avg. velocity: 26
Fails: 0

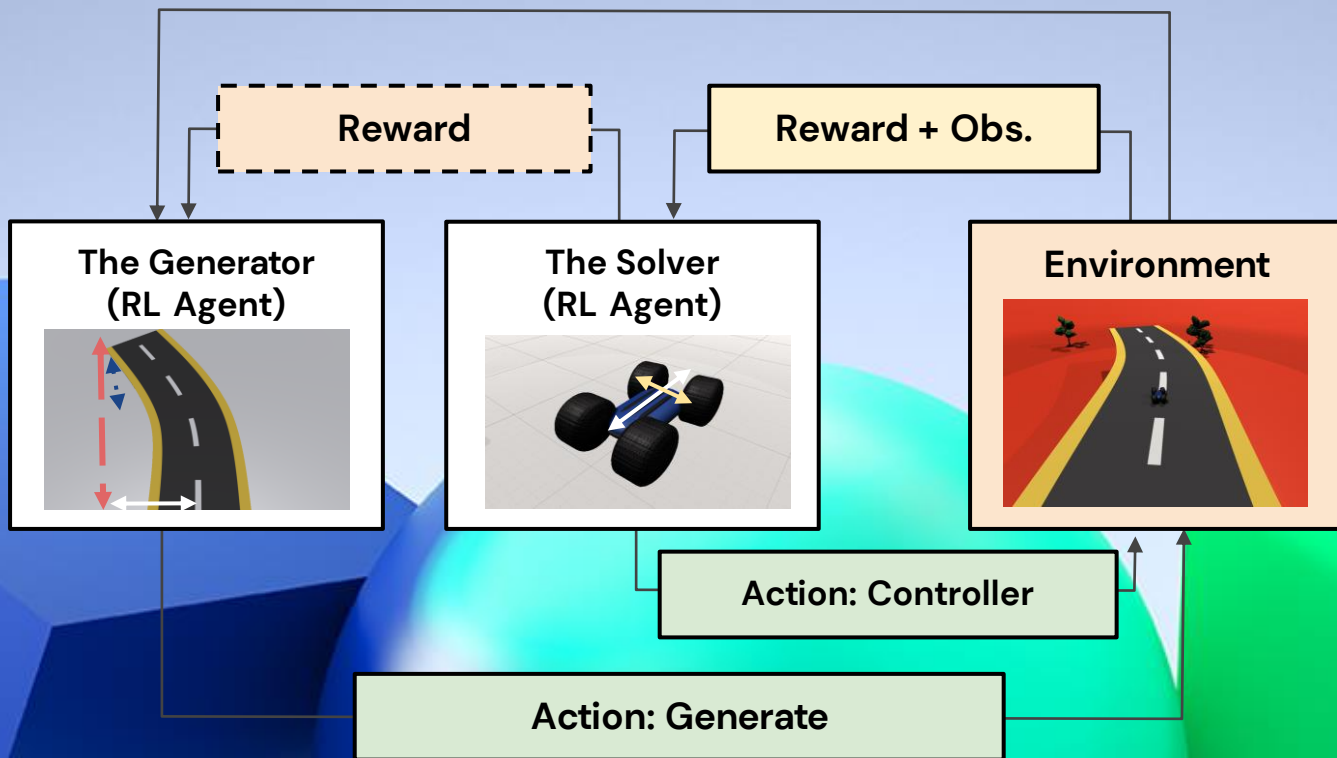


Adversarial Reinforcement Learning for Procedural Content Generation COG'21

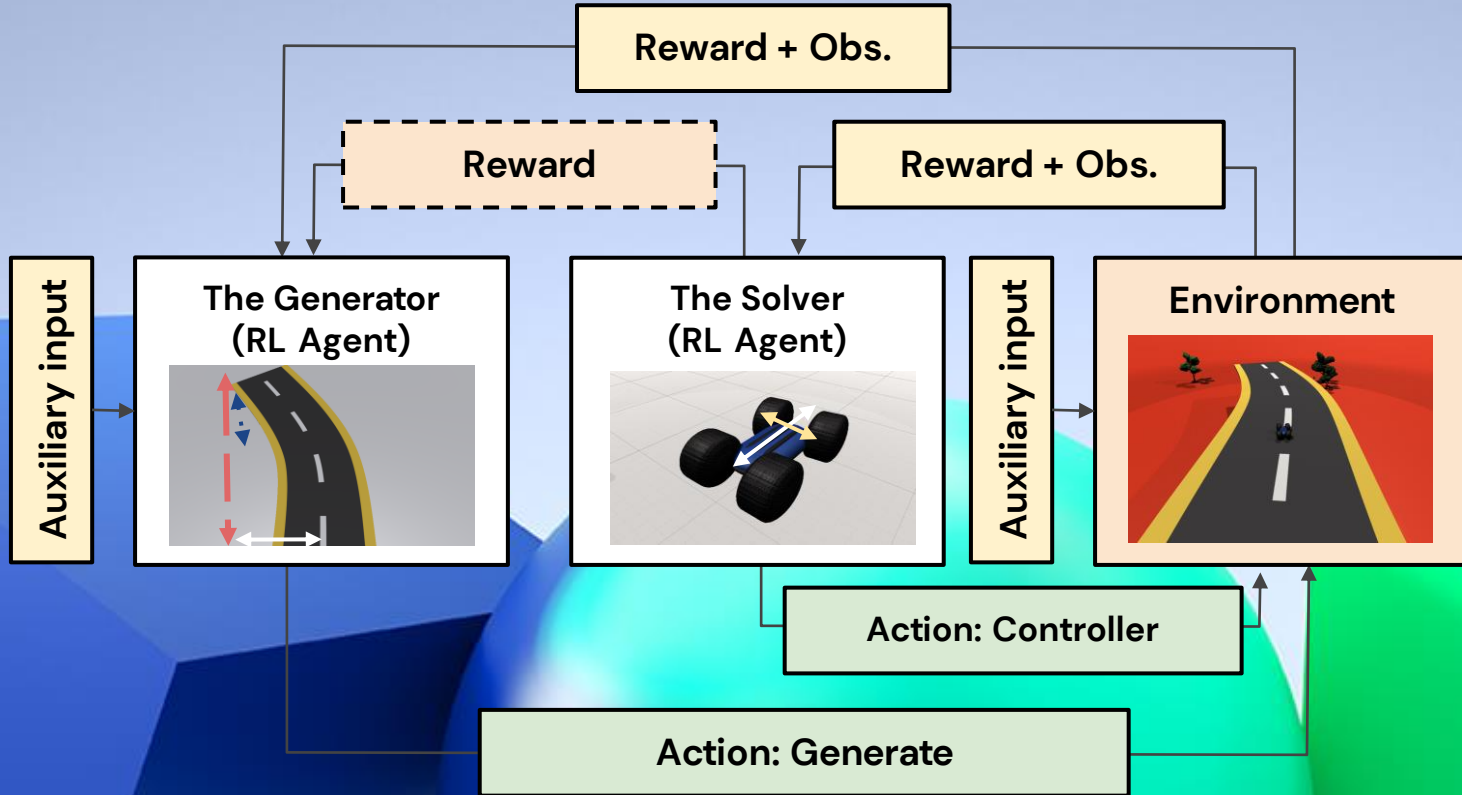
Architecture: Reinforcement Learning

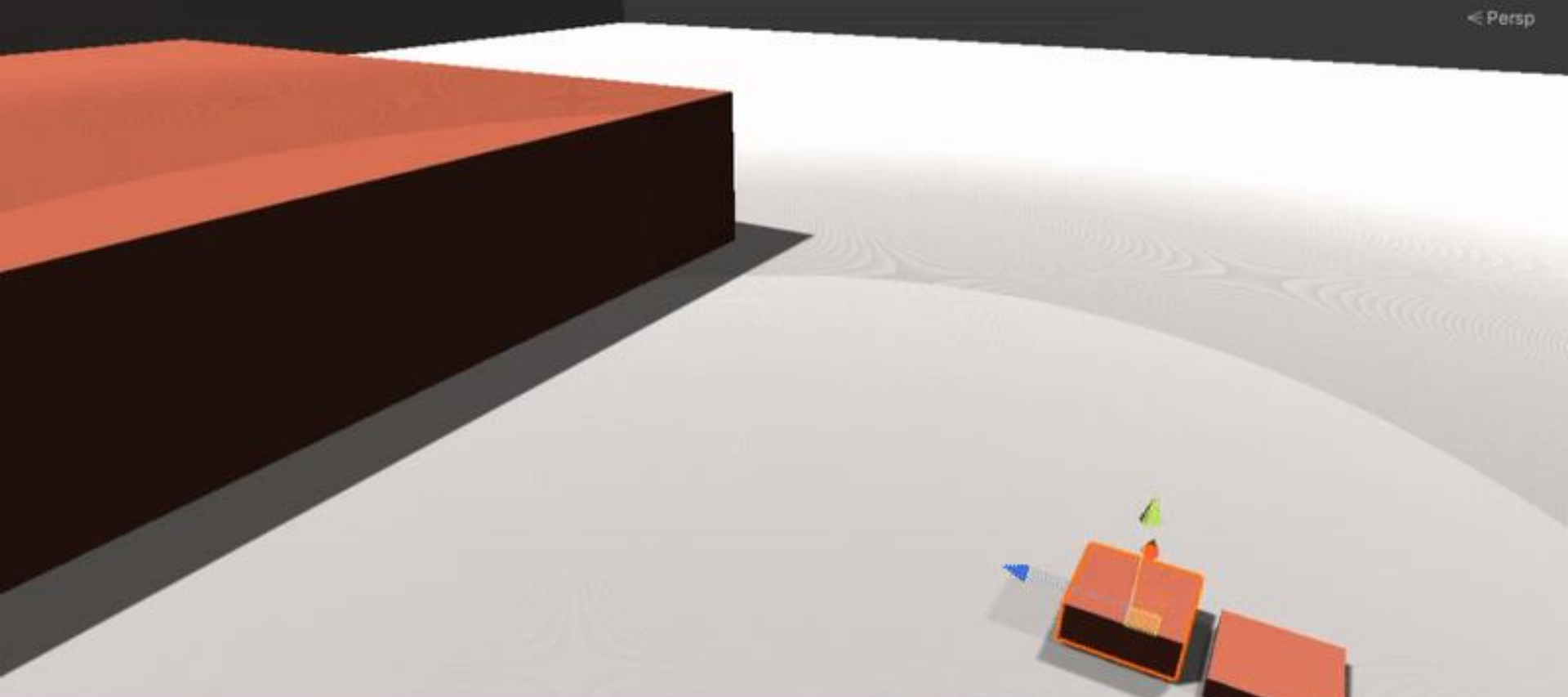


Architecture: RL Solver & RL Generator



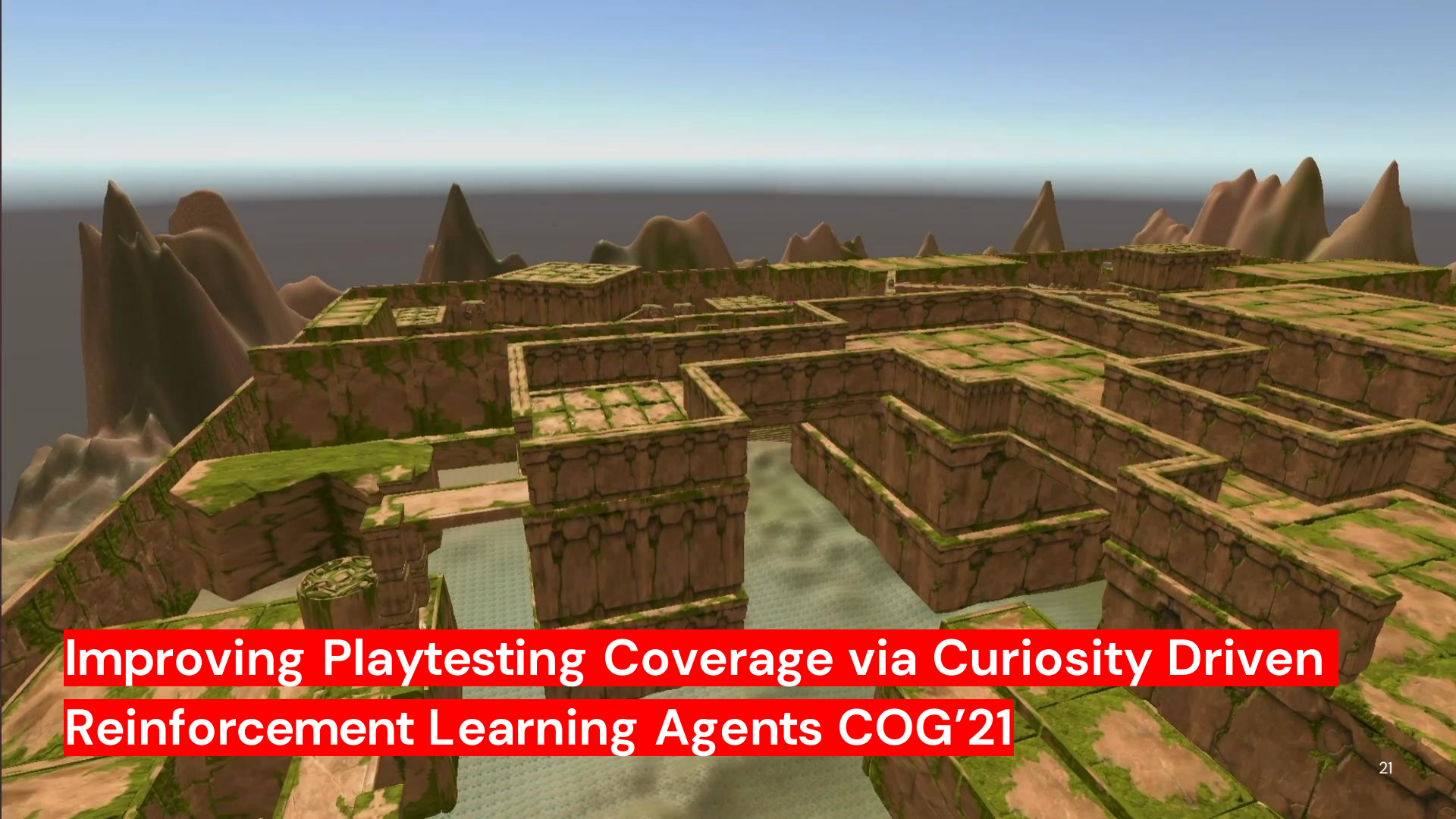
Architecture: Adversarial RL for PCG





Game Testing

Fully-trained RL agent can be used as a game tester in real time



**Improving Playtesting Coverage via Curiosity Driven
Reinforcement Learning Agents COG'21**

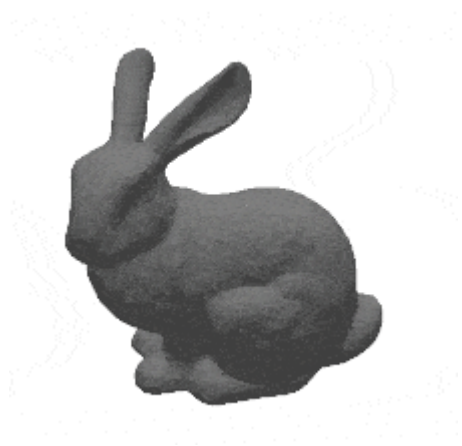


It Takes Two

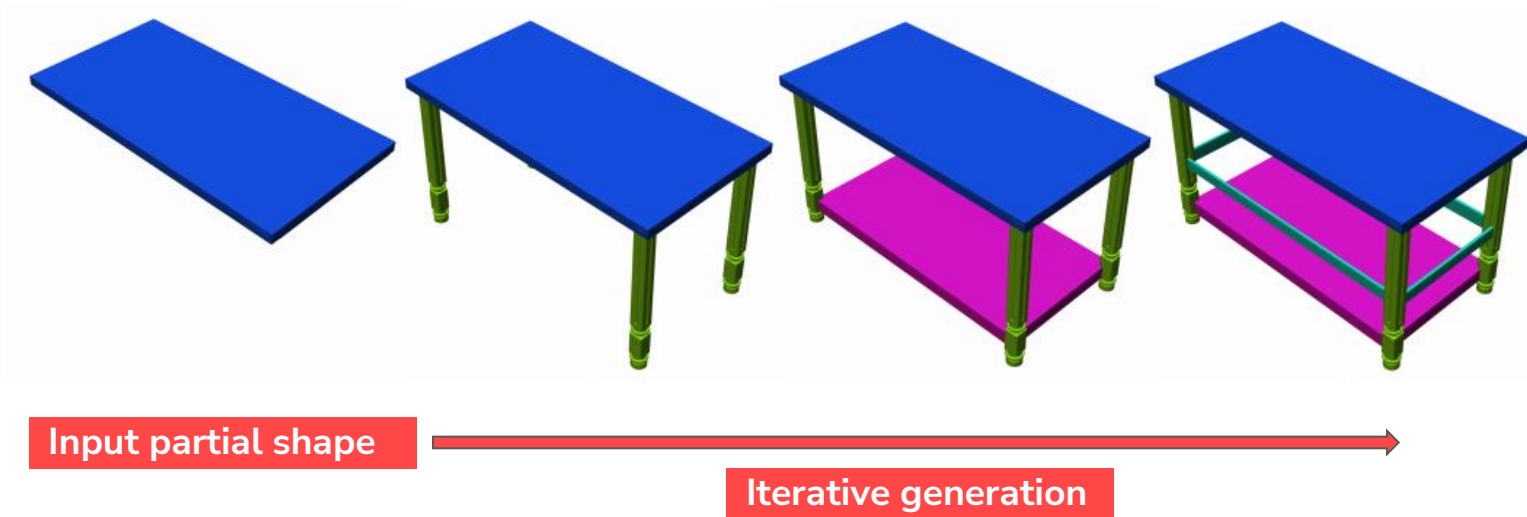
Generative Art

Artist-friendly Content
at Scale

3D style transfer



Artist-assisted model generation





**That's all folks
Thank you!
seed.ea.com
ktollmar@ea.com**