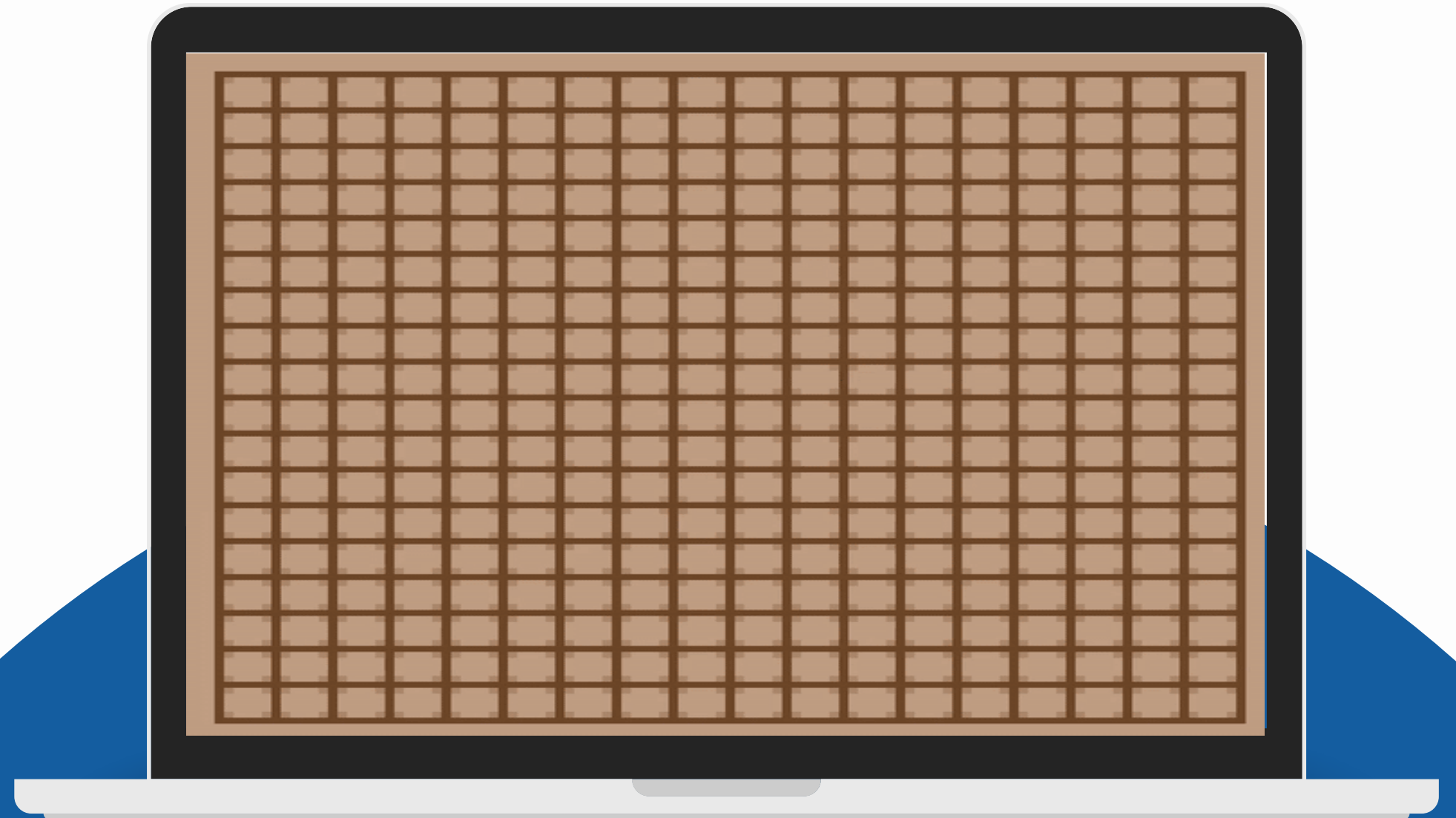




# PettingZoo

Seyede Setare Khosravi, Mobina Lashgari

Professor: Dr. Saeed Shamaghdari



RL in Control | Fall 2024

# PettingZoo

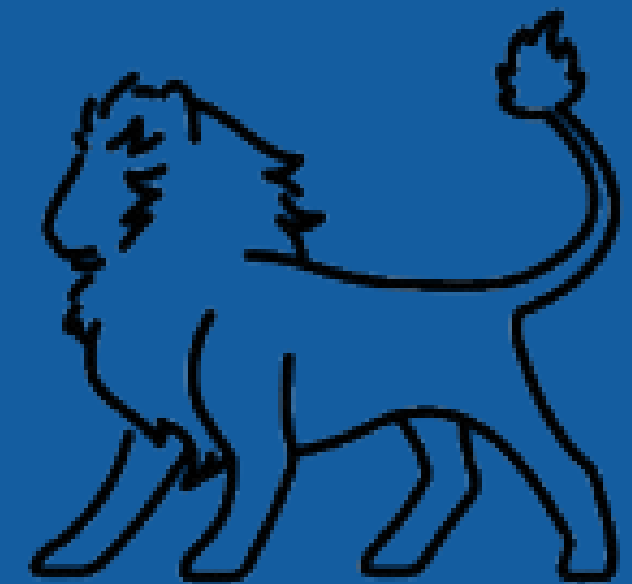
**RL Platform**

**Multi Agent Envs**

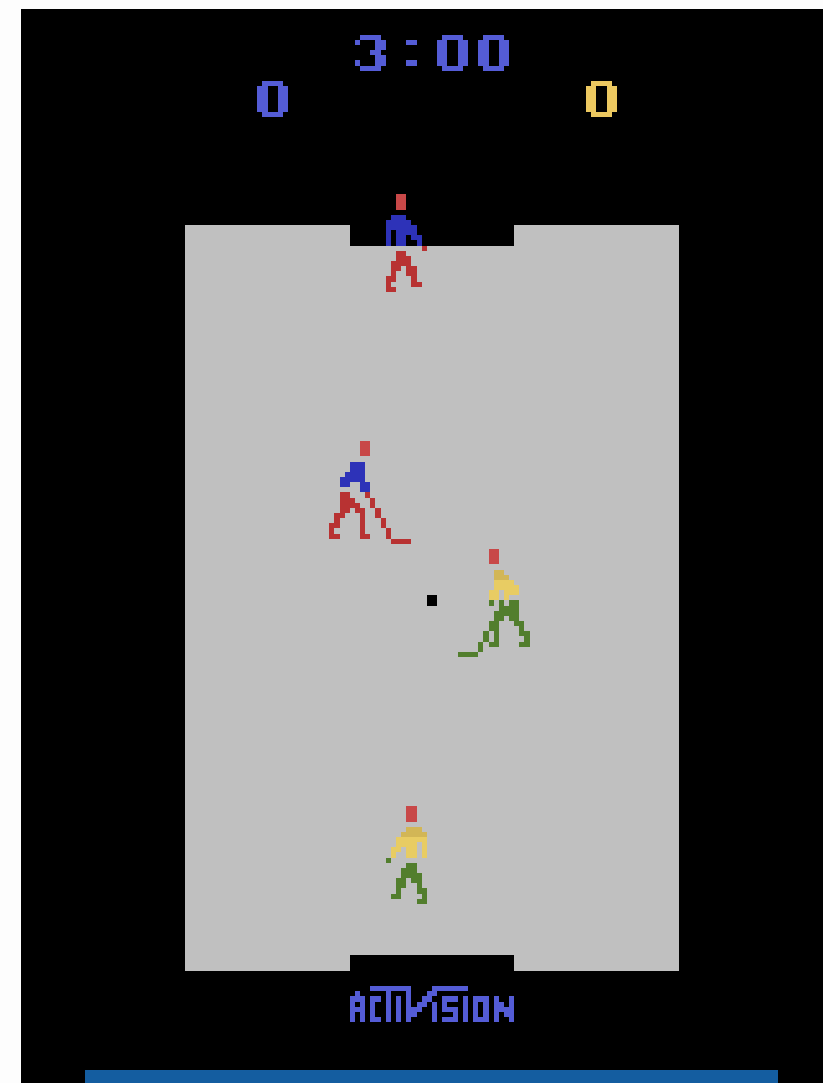
**Open Source**

**OPENAI GYM**

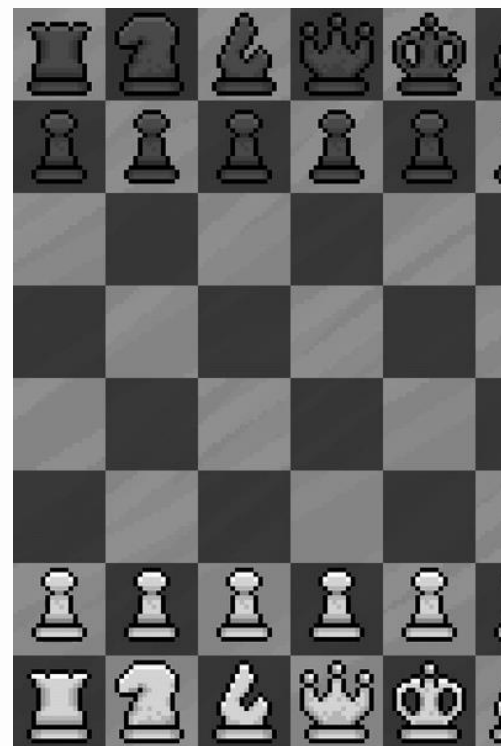
**Different Envs**



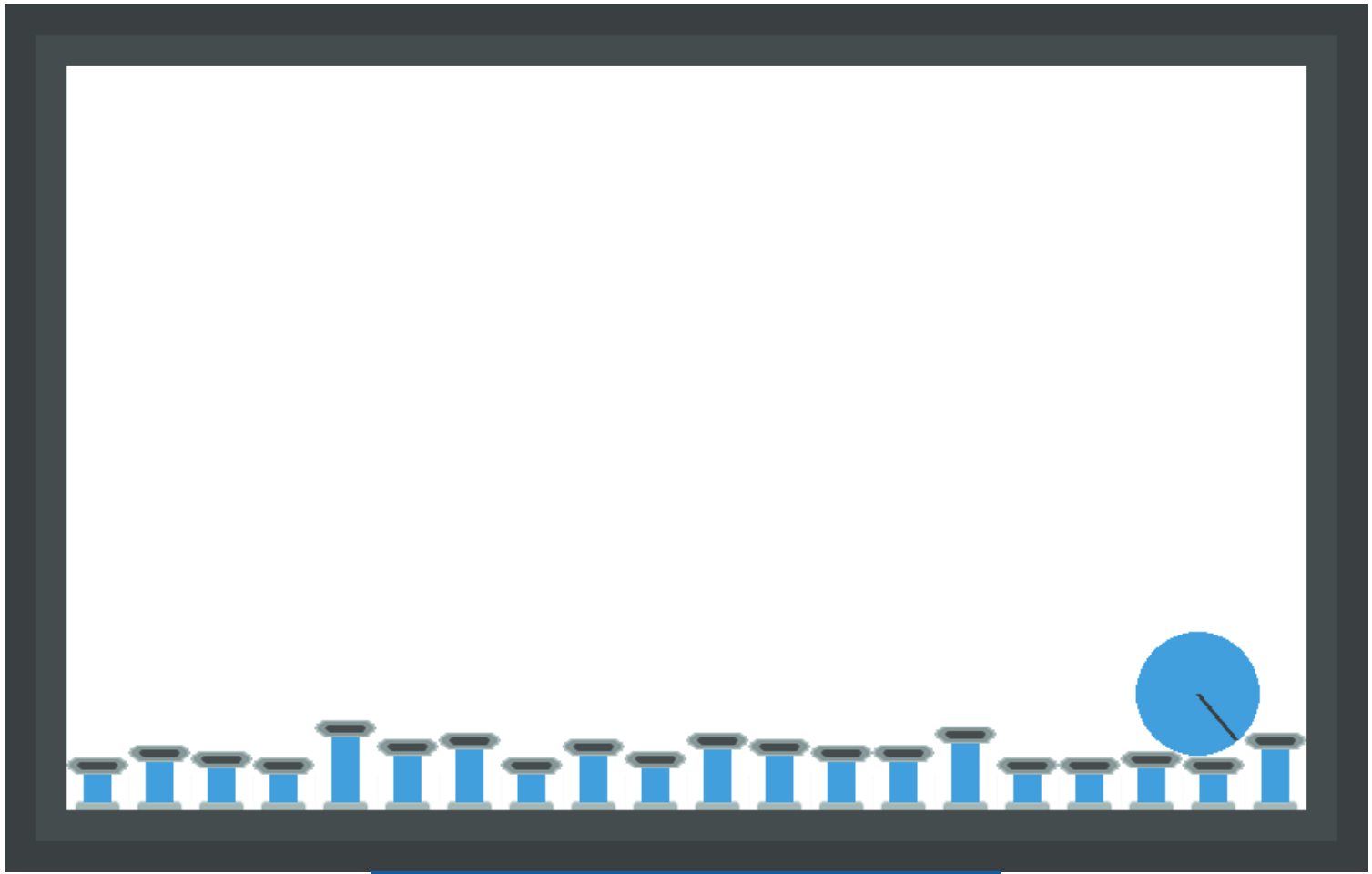
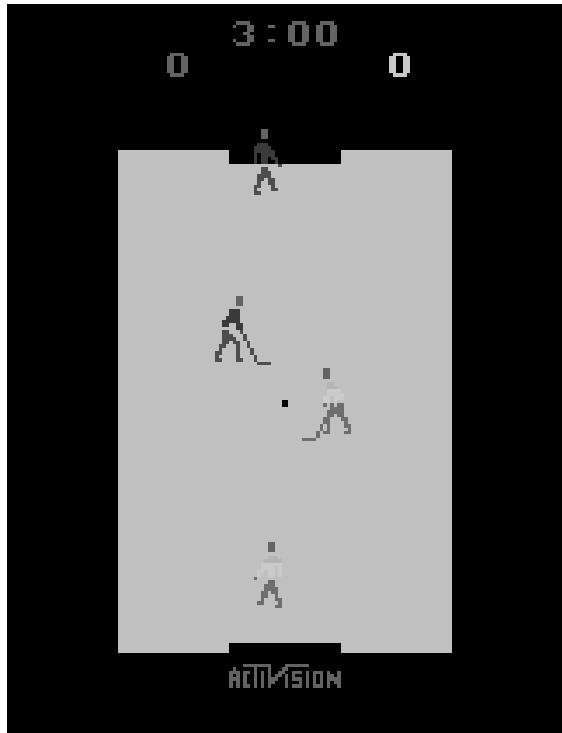
# PettingZoo Games



Atari



# PettingZoo Games



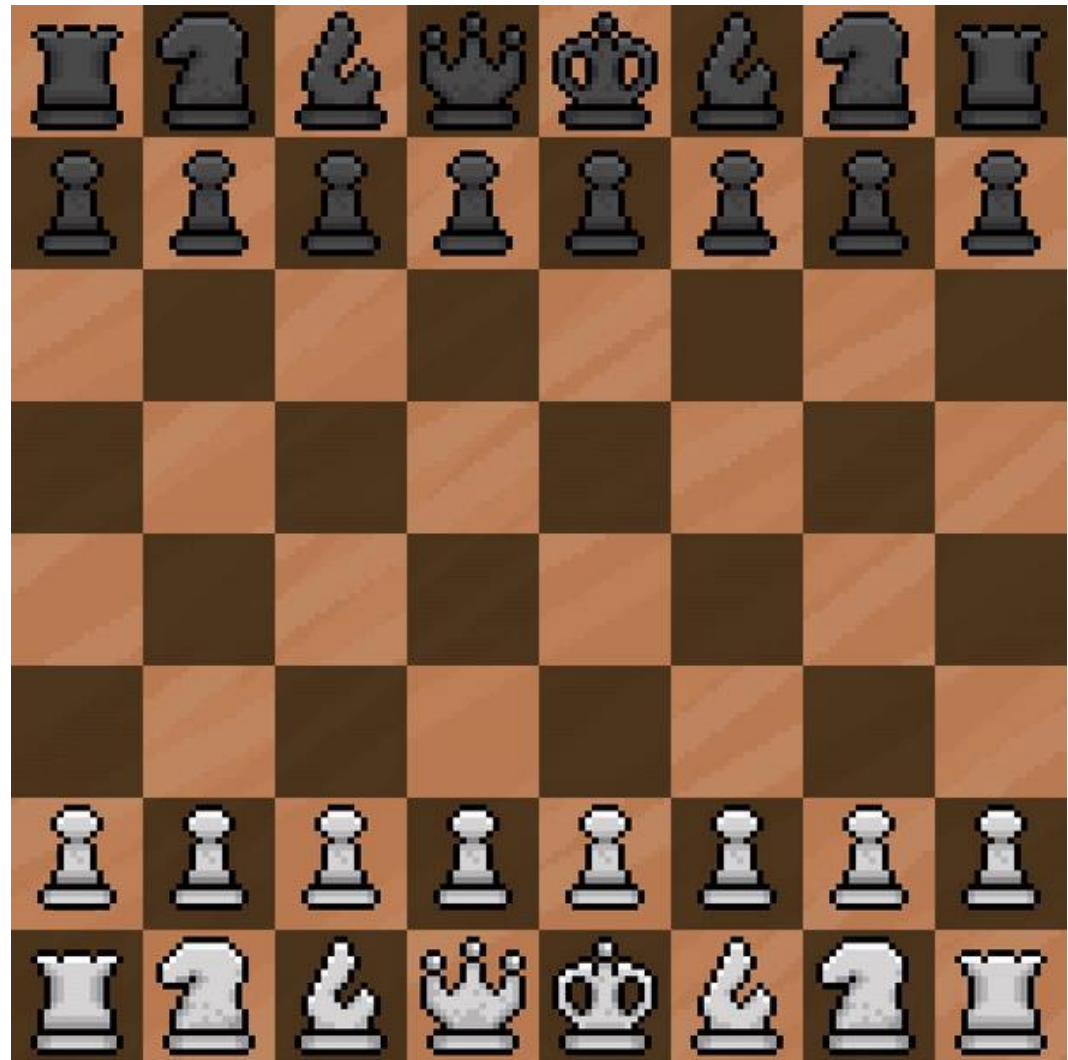
Butterfly



speaker\_0 sends



# PettingZoo Games



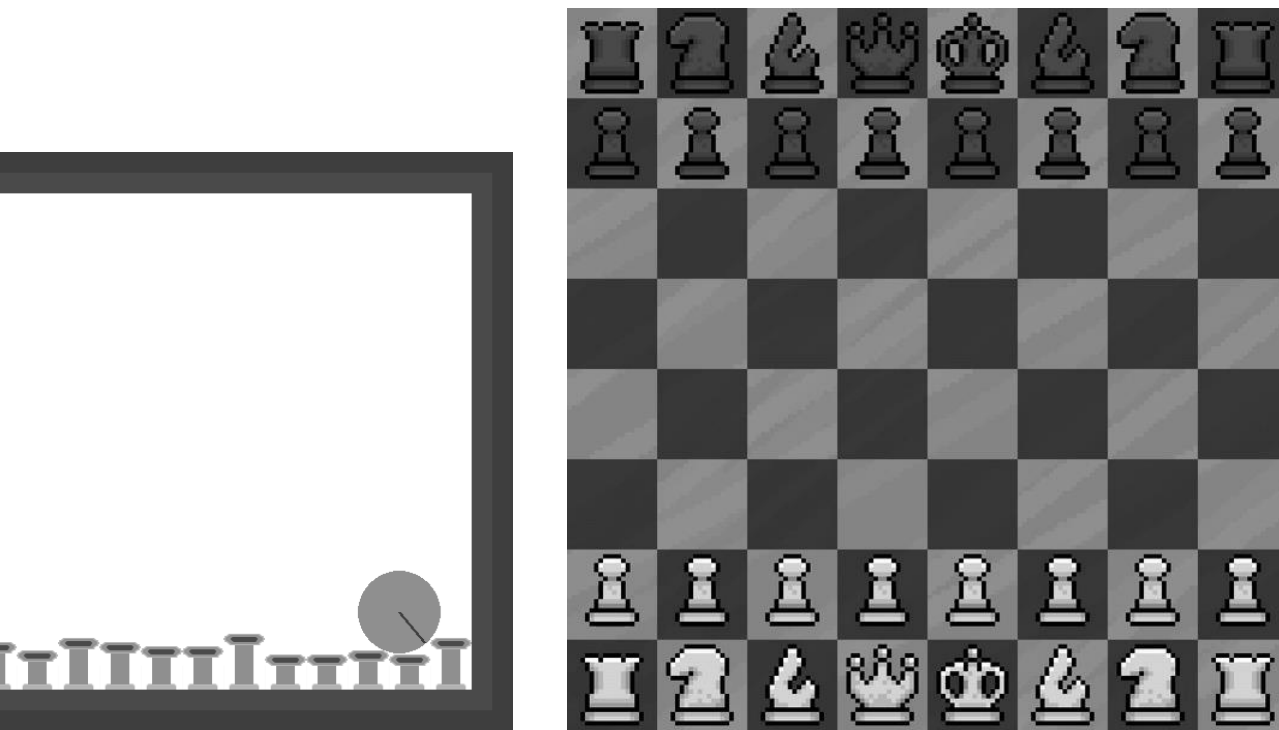
Classic



speaker\_0 sends C



# PettingZoo Games

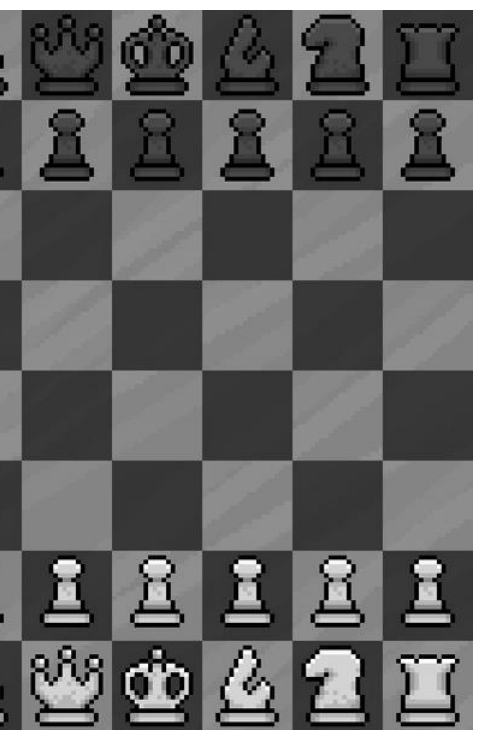


speaker\_0 sends C

MPE



# PettingZoo Games

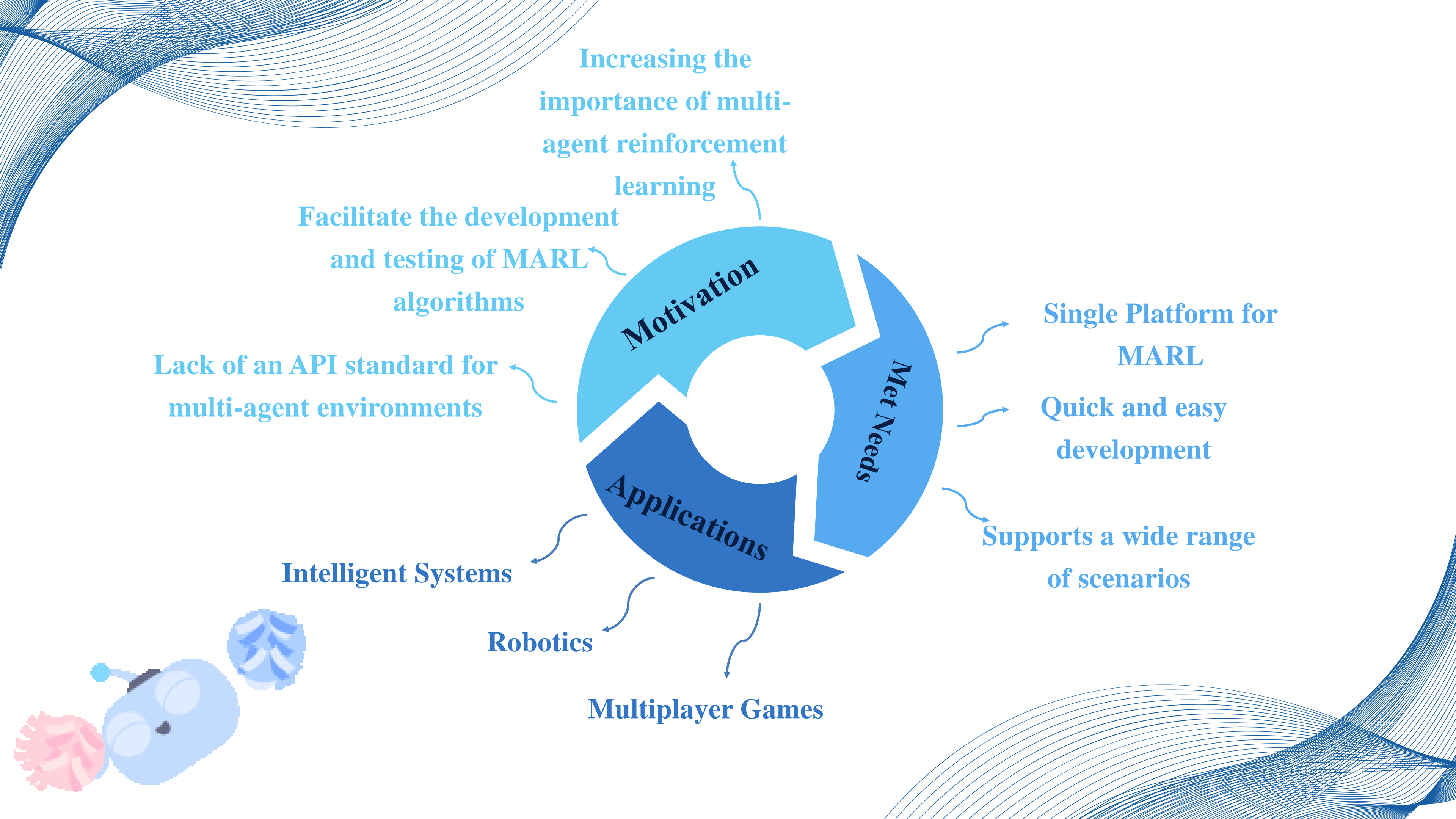


speaker\_0 sends C



SISL







# ویژگی‌های کلیدی



## Diverse environments

Includes games, physical simulations, etc.



## Supports different types of environments

- 1.AEC: Agents act in turn.
- 2.Parallel: All agents act at the same time.
- 3.MPE: Simple and fast environments for basic testing.



## Extensibility, modularity

Ability to add new and customized environments



## Gymnasium Compatibility

Ability to integrate with GYM and other RL libraries



## Disadvantages

- **Lacks advanced visualization tools**
- **Focus more on simpler scenarios**
- **Lack of focus on real robotics**
- **Incapable in systems with a high number of agents**



## Advantages

- **OpenAI Gym Compatibility**
- **High Flexibility**
- **Simplicity of use**
- **Extensibility**
- **Interaction with different environments**
- **Free Access**



# Supported Algorithms

 **DQN**

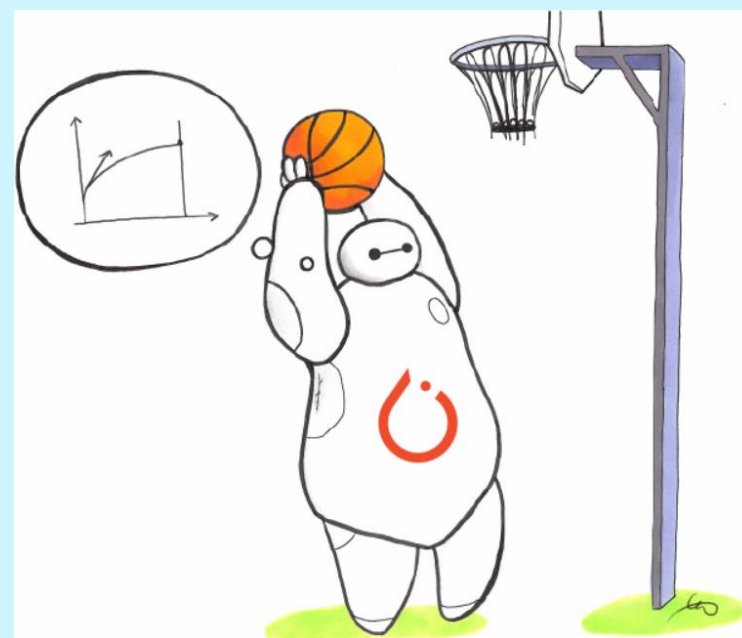
 **PPO**

 **SAC**

 **A2C**



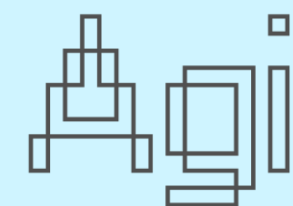
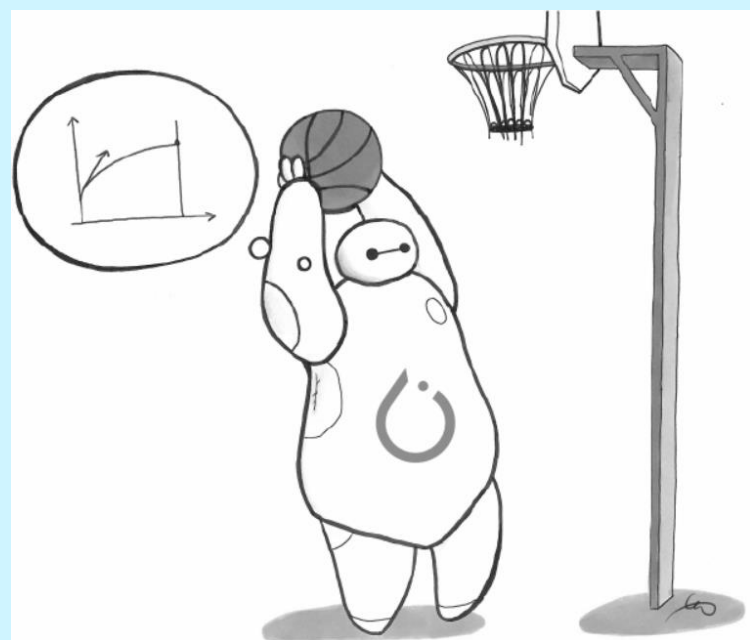
# Supported Libraries



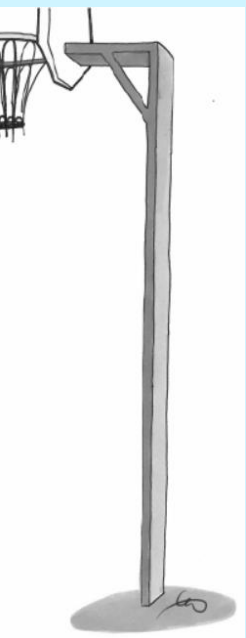
 Tianshou

 RLI

# Supported Libraries




# Supported Libraries



 Tianshou

 RLlib

 AgileAL



# Supported Libraries

onshou



AgileAL

# Scalability

**Supports  
scalability in  
multi-agent  
scenarios**

**Parallel  
processing  
support**

**Manage  
scalable  
environmen  
ts**


**Large-scale  
memory  
management  
and high  
performance**

**Vertical and  
horizontal  
scalability**

**Increasing  
the speed of  
training with  
distributed  
techniques**



# Real-World Practical Examples



**Research in  
the field of  
optimizing  
the behavior  
of agents**

**Research in  
Multi-agent  
Reinforcement  
Learning**

**Optimizing  
Distributed  
Systems**

**Application  
in Robotics  
and  
Autonomous  
Systems**

**Use in  
multiplayer  
games and  
simulations**



# How to install

řĩř ĩņşţǎĺĺ řêţţĩņġćộộ

řĩř ĩņşţǎĺĺ řêţţĩņġćộộ Aţǎsĩ

řĩř ĩņşţǎĺĺ ăựộsộ  
AựộRỒ  
AựộRỒ ĩņşţǎĺĺ đĩs ợộņţēņţ  
AựộRỒ ăợợểợợ lĩợợợợ

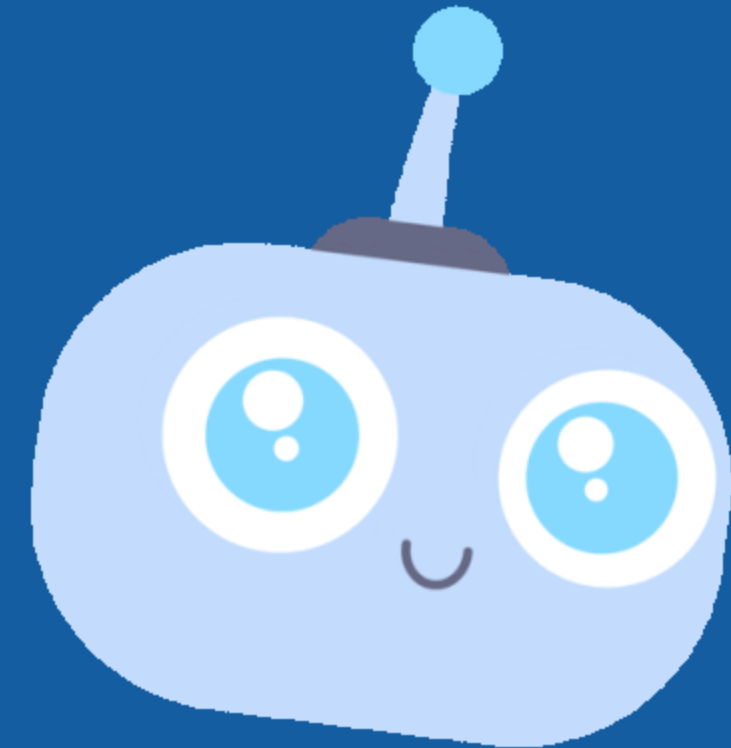
# Simulation Principles

ênw cộy.ingô w, ênw sêndê s nộđê hụnắn

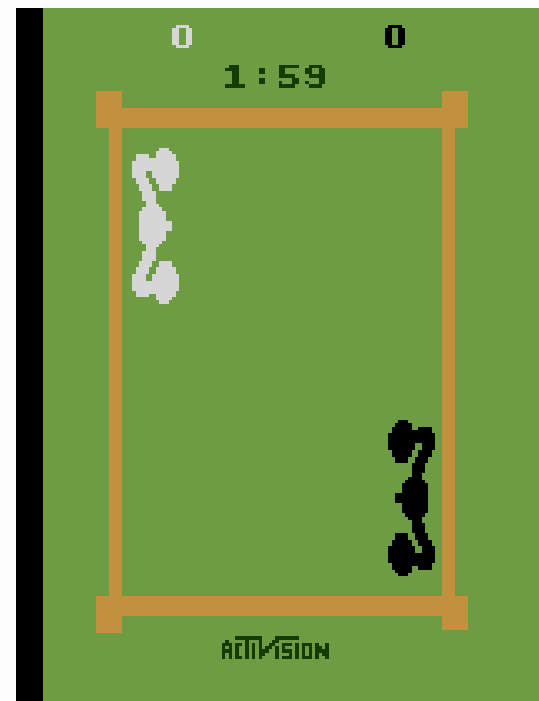
ộc sê s wắ t i ộ n sê xắ đ t i ê s n i nắ t i ộ n t s u n c i n g ộ ê n w lắ s t i

ênw ắ g ê n t i t i ê s

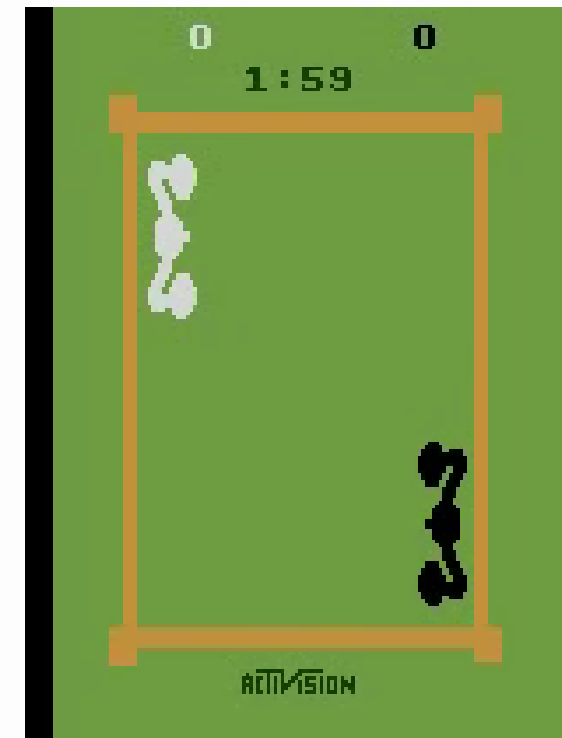
ênw s t i ê r ắ c t i ộ n



# Simulation



**Boxing**  
Constant Action



**Boxing**  
Random Action





# Future Development



01

**Developing new environments**

02

**Better integration with advanced algorithms**

03

**Development of analytics and monitoring tools**

04

**Better scalability and distributionability**

05

**Increasing engagement with the user community**

# References

## Main Sources:

1. PettingZoo official website: Includes complete documentation, installation guides, and up-to-date information about the platform.
2. PettingZoo GitHub Repository: Includes PettingZoo's source code, issues raised by the user community, and new updates.

User Forums and Groups:

Stack Overflow: For technical questions and answers.

Discord and Reddit: Active user groups to exchange experiences.

**Thank you for your attention.**

