



R: Real-time

I: Intelligent

S: Secure

E: Explainable

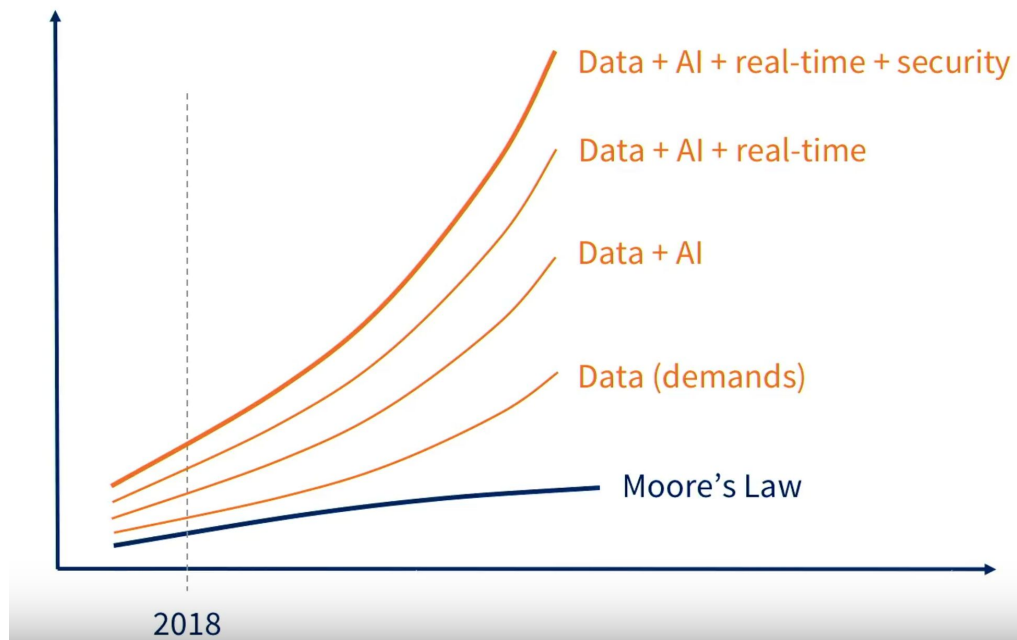
By Group 7: Shuhao Xia, Chiwen Shi, Wensong Liu, Ying Lu

Three Challenges

1.Scale

2.Complexity

3.Security



Ray

-----**Distributed execution framework for emerging AI apps**

① Ease of use

- Minimal changes to parallelize existing Python code

② Flexibility

- Unifies training, simulation, and serving

③ Performance

- Scales to millions of scheduled tasks per second

Tune

-----Scalable Hyperparameter Search



Tune is a scalable framework for hyperparameter search with a focus on deep learning and deep reinforcement learning.

Hyperparameter

In machine learning, a hyperparameter is a parameter whose value is set before the learning process begins. By contrast, the values of other parameters are get from training. Different model training algorithms require different hyperparameters.

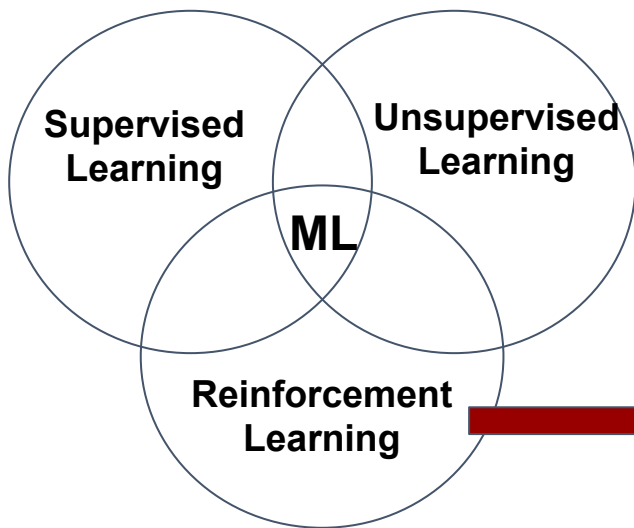
Given these hyperparameters, the training algorithm learns the parameters from the data.

Why a framework for tuning hyperparameters?

- We want the best model
- Model training is time-consuming
- Resources are expensive: Tuning hyperparameters is often the most expensive part of the machine learning workflow. Tune is built to address this, demonstrating an efficient and scalable solution for this pain point.

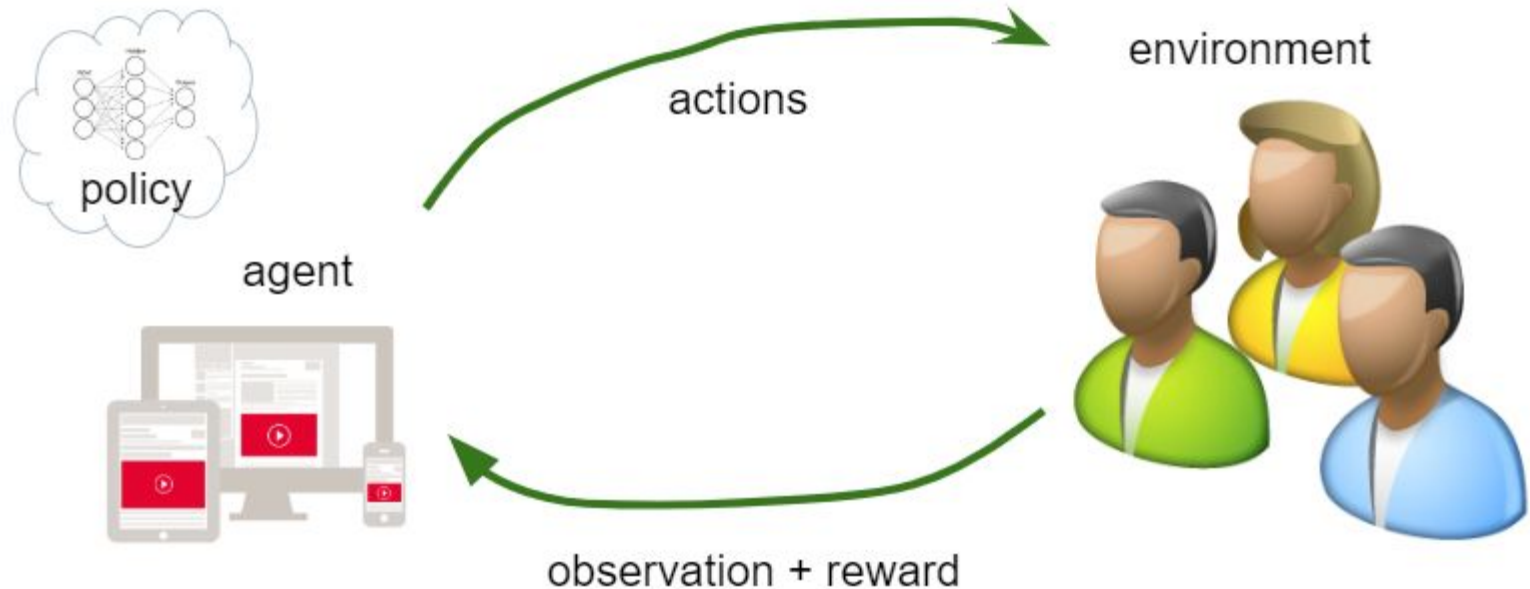
RLlib

- RLLib is a scalable and combinable RL library build on top of Ray
- RL: Reinforcement Learning



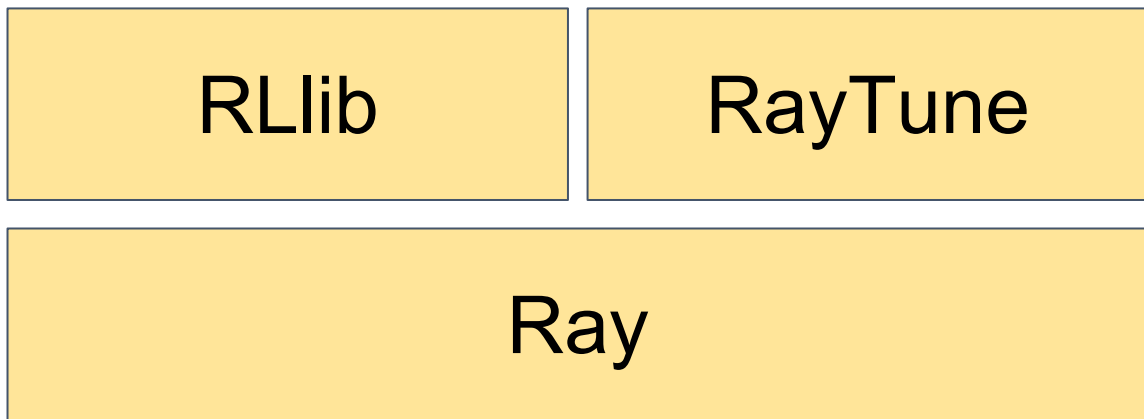
How software **agents** should take actions in an **environment** so as to maximize the cumulative **reward**.

RL is centered around **interaction**



A policy specifies which action to take in each state, so as to maximize the cumulative rewards.

What is RLlib?



- RLlib supports many kinds of framework for scalable applied reinforcement learning
- It provides some popular RL algorithms, such as PPO(Proximal Policy Optimization)