

# Reinforcement Learning

Playing with TF-Agents

N. Rich Nguyen, PhD  
**SYS 6016**

# TF-Agents

A robust, scalable and easy to use RL Library for Tensorflow

## Why use TF-Agents?

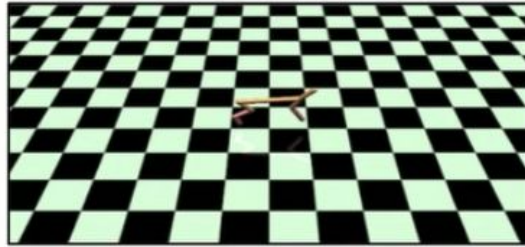
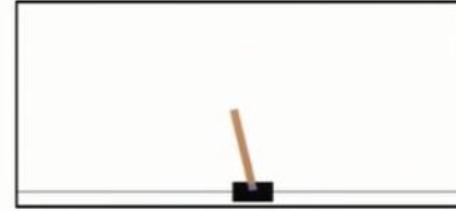
- Great for learning RL: Colabs, examples, documentation.
- Well suited for solving complex problems with RL with quick prototypes
- Well tested and easy to configure.

## Built for Tensorflow 2.0 (and backward compatible):

- Develop and debug quickly with TF-Eager.
- Use `tf.keras` to define your networks and `tf.function` to speed everything up.
- Modular and extensible

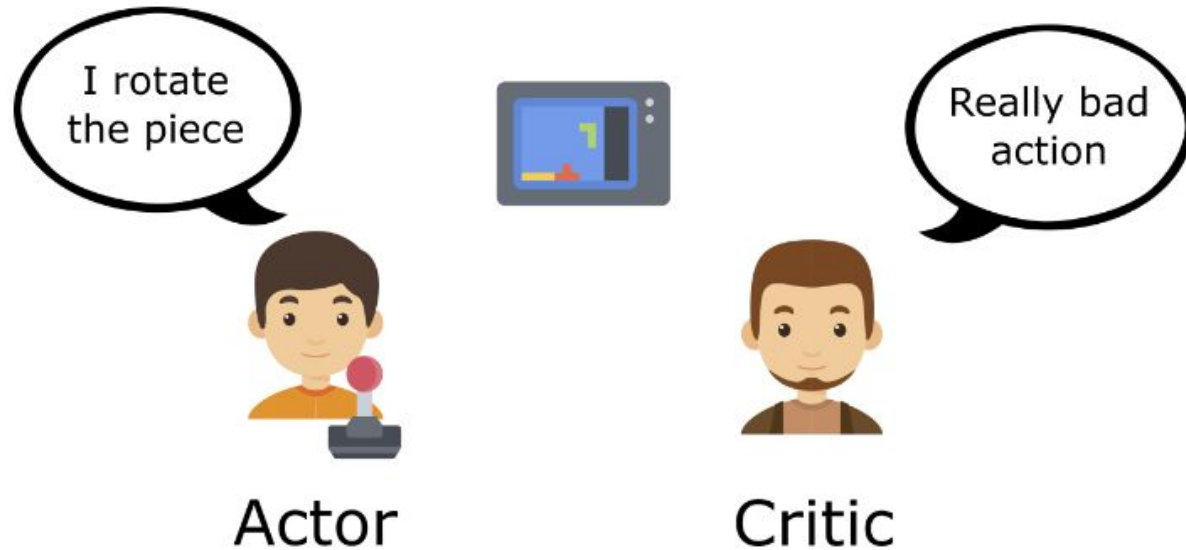
# Available Environment Suites

- OpenAI-Gym
- Atari
- PyBullet
- DM-Control
- Your own?

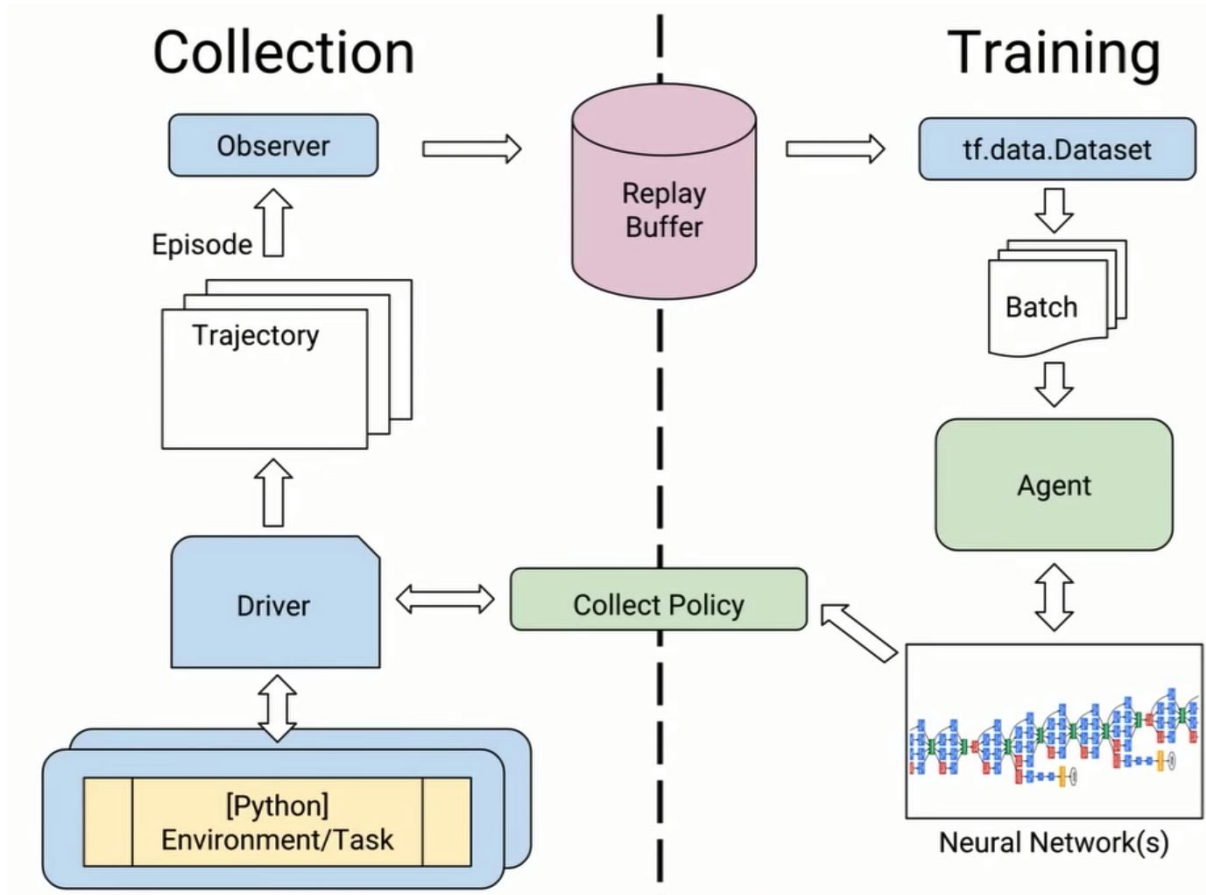


# Available Agents

- DQN
- REINFORCE
- DDPG
- TD3
- PPO
- SAC



# System Overview



# Demo on the Cart Pole problem

# Tensorflow Dev Summit 2019

<https://youtu.be/tAOApRQAqpc>



Intermediate

TF-Agents Library



# Some advice on study RL

## Background

- Fundamentals in linear algebra, statistics, calculus
- Deep learning basics
- Deep RL basics
- TensorFlow (or PyTorch)

## Learn by doing

- Implement some deep RL algorithms (TF-Agents)
- Look for tricks in papers that were key to get it to work
- Iterate fast in simple environments

## Research

- Improve on an existing approach
- Focus on an unsolved task / benchmark
- Create a new task / problem that hasn't been addressed

