

Robot playing table tennis after just 90 minutes of training

1. Context

1.1 Addressed “problem”

This technology addresses the “problem” of learning to play table tennis. The goal is to make a robot able to play table tennis against humans in the real world.

1.2 Solution

The solution that the paper presents is based on reinforcement learning. First, they developed a simulator of table tennis as realistic as possible. Then, they used the simulator to train a model using reinforcement learning. They did so for two main reasons:

- Reinforcement learning algorithms need a lot of samples to learn. Therefore, real world data isn't suited for this purpose as it's really expensive to generate.
- Reinforcement learning algorithms learn with trial and error. As such, they allow the algorithm to learn the dynamics of the game without worrying about safety

Then in a second phase, they embodied their pre-trained algorithm in a real mechanical arm. Then, they trained it in the real world using another robot that throws a ping pong ball randomly at it. This time, the movements of the robots were constrained for security.

After being trained they were able to play against the robot at a pretty fair level. After playing against it they described the robot as being “not worse than a regular human player”.

2. Opinion

My personal opinion is that the press article tends to overclaim the real work described in the paper. Overall I'm not really convinced that this kind of technology is useful for real world applications yet.

2.1 Pros

- The robot learns by himself to play
- The total learning time spent is very quick for the standards of these algorithms
- Safety measures

2.2 Cons

- A lot of inductive bias has been used in the setting so it's not really learning from scratch
- Security measures used here are hard to adapt for other settings
- All the “intelligence” of the system is outsourced on the developers (see *On the Measure of Intelligence* by François Chollet on the topic)