SpaceInvaders

This environment is part of the [Atari environments](). Please read that page first for general information.

Action Space	Discrete(18)
Observation Space	(210, 160, 3)
Observation High	255
Observation Low	0
Import	`gym.make("ALE/SpaceInvaders-v5")`

Description

Your objective is to destroy the space invaders by shooting your laser cannon at them before they reach the Earth. The game ends when all your lives are lost after taking enemy fire, or when they reach the earth. Detailed documentation can be found on [the AtariAge page]().

Actions

By default, all actions that can be performed on an Atari 2600 are available in this environment. However, if you use v0 or v4 or specify `full_action_space=False` during initialization, only a reduced number of actions (those that are meaningful in this game) are available. The reduced action space may depend on the flavor of the environment (the combination of `mode` and `difficulty`). The reduced action space for the default flavor looks like this:

Num	Action
0	NOOP
1	FIRE
2	RIGHT
3	LEFT
4	RIGHTFIRE
5	LEFTFIRE

Observations

By default, the environment returns the RGB image that is displayed to human players as an observation. However, it is possible to observe

- The 128 Bytes of RAM of the console
- A grayscale image

instead. The respective observation spaces are

- `Box([0 ... 0], [255 ... 255], (128,), uint8)`
- `Box([[0 ... 0] ... [0  ... 0]], [[255 ... 255] ... [255  ... 255]], (250, 160), uint8)`

respectively. The general article on Atari environments outlines different ways to instantiate corresponding environments via `gym.make`.

Rewards

You gain points for destroying space invaders. The invaders in the back rows are worth more points. For a more detailed documentation, see [the AtariAge page](#).

Arguments

```
env = gym.make("ALE/SpaceInvaders-v5")
```

The various ways to configure the environment are described in detail in the article on Atari environments. It is possible to specify various flavors of the environment via the keyword arguments `difficulty` and `mode`. A flavor is a combination of a game mode and a difficulty setting.

Environment	Valid Modes	Valid Difficulties	Default Mode
SpaceInvaders	`[0, ..., 15]`	`[0, 1]`	`0`

You may use the suffix "-ram" to switch to the RAM observation space. In v0 and v4, the suffixes "Deterministic" and "NoFrameskip" are available. These are no longer supported in v5. In order to obtain equivalent behavior, pass keyword arguments to `gym.make` as outlined in the general article on Atari environments. The versions v0 and v4 are not contained in the "ALE" namespace. I.e. they are instantiated via `gym.make("SpaceInvaders-v0")`.

Version History

A thorough discussion of the intricate differences between the versions and configurations can be found in the general article on Atari environments.

- v5: Stickiness was added back and stochastic frameskipping was removed. The entire action space is used by default. The environments are now in the "ALE" namespace.
- v4: Stickiness of actions was removed
- v0: Initial versions release (1.0.0)