



SpaceInvaders



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

Action Space	Discrete(6)
Observation Space	Box(0, 255, (210, 160, 3), uint8)
Import	<code>gymnasium.make("ALE/SpaceInvaders-v5")</code>

For more SpaceInvaders variants with different observation and action spaces, see the variants section.

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.

For a more detailed documentation, see [the AtariAge page](#)

Actions

SpaceInvaders has the action space of `Discrete(6)` with the table below listing the meaning of each action's meanings. To enable all 18 possible actions that can be performed on an Atari 2600, specify `full_action_space=True` during initialization or by passing `full_action_space=True` to `gymnasium.make`.

Value	Meaning	Value	Meaning	Value	Meaning
0	NOOP	1	FIRE	2	RIGHT
3	LEFT	4	RIGHTFIRE	5	

v0.9.1 (latest)



Observations

Atari environments have three possible observation types:

- `obs_type="rgb"` -> `observation_space=Box(0, 255, (210, 160, 3), np.uint8)`
- `obs_type="ram"` -> `observation_space=Box(0, 255, (128,), np.uint8)`
- `obs_type="grayscale"` -> `Box(0, 255, (210, 160), np.uint8)`, a grayscale version of the `q"rgb"` type

See variants section for the type of observation used by each environment id by default.

Reward

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](#).

Variants

SpaceInvaders has the following variants of the environment id which have the following differences in observation, the number of frame-skips and the repeat action probability.

Env-id	obs_type=	frameskip=	repeat_action_probability=
SpaceInvaders-v0	"rgb"	(2, 5)	0.25
SpaceInvaders-ram-v0	"ram"	(2, 5)	0.25
SpaceInvaders-ramDeterministic-v0	"ram"	3	0.25
SpaceInvaders-ramNoFrameskip-v0	"ram"	1	0.25
SpaceInvadersDeterministic-v0	"rgb"	3	0.25
SpaceInvadersNoFrameskip-v0	"rgb"	1	0.25
SpaceInvaders-v4	"rgb"	(2, 5)	0.0
SpaceInvaders-ram-v4	"ram"	(2, 5)	0.0
SpaceInvaders-ramDeterministic-v4	"ram"	3	0.0
SpaceInvaders-ramNoFrameskip-v4	"ram"	1	0.0
SpaceInvadersDeterministic-v4	"rgb"	3	0.0
SpaceInvadersNoFrameskip-v4	"rgb"	1	0.0
ALE/SpaceInvaders-v5	"rgb"	4	0.25
ALE/SpaceInvaders-ram-v5	"ram"	4	v0.9.1 (latest)



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. The table below lists the possible difficulty and mode values along with the default values.

Available Modes	Default Mode	Available Difficulties	Default Difficulty
<code>[0, ..., 15]</code>	<code>0</code>	<code>[0, 1]</code>	<code>0</code>

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 frame-skipping was removed. The environments are now in the “ALE” namespace.
- v4: Stickiness of actions was removed
- v0: Initial versions release

