

# Informe de openIA

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## • Que es universe openAI?

Es una plataforma de software para medir y entrenar la inteligencia general de una IA a través del suministro mundial de juegos, sitios web y otras aplicaciones. Es una extensión de OpenAI Gym. Proporciona la capacidad de capacitar y evaluar agentes en una amplia gama de entornos simples y complejos en tiempo real. Tiene acceso ilimitado a muchos entornos de juego.

### 1. Instalación de librería Universe,

```
In [8]: from easyAI import TwoPlayersGame, Human_Player, AI_Player, Negamax
import numpy as np

In [*]: !pip install Universe

Collecting Universe
  Downloading universe-0.21.3.tar.gz (136 kB)
    |██████████| 136 kB 314 kB/s eta 0:00:01
Collecting autobahn>=0.16.0
  Downloading autobahn-20.6.2-py2.py3-none-any.whl (1.5 MB)
    |██████████| 1.5 MB 591 kB/s eta 0:00:01
Collecting docker-py==1.10.3
  Downloading docker_py-1.10.3-py2.py3-none-any.whl (48 kB)
    |██████████| 48 kB 179 kB/s eta 0:00:01
Collecting docker-pycreds==0.2.1
  Downloading docker_pycreds-0.2.1-py2.py3-none-any.whl (4.5 kB)
Collecting fastbarlight>=0.0.13
  Downloading fastbarlight-0.0.14.tar.gz (728 kB)
    |██████████| 728 kB 621 kB/s eta 0:00:01
Collecting go-vncdriver==0.4.8
  Downloading go_vncdriver-0.4.19.tar.gz (638 kB)
    |██████████| 638 kB 597 kB/s eta 0:00:01
Collecting gym>=0.8,<=0.7
  Downloading gym-0.7.4.tar.gz (152 kB)
    |██████████| 152 kB 597 kB/s eta 0:00:01
Requirement already satisfied: p... Captura de Pantalla
ers/edisonhuinaizaca/opt/anaconda3/lib/python3.7/site-packages (fr
```

### 2. Instalación de librería de openAI

```
In [8]: from easyAI import TwoPlayersGame, Human_Player, AI_Player, Negamax
import numpy as np

In [2]: !pip install openAI

Collecting openAI
  Downloading openai-0.2.4.tar.gz (157 kB)
    |██████████| 157 kB 308 kB/s eta 0:00:01
Requirement already satisfied: requests>=2.20 in /Users/edisonhuinaizaca/opt/anaconda3/lib/python3.7/site-packages (from openAI) (2.22.0)
Requirement already satisfied: urllib3<1.25.0,>=1.25.1, <1.26, >=1.21.1 in /Users/edisonhuinaizaca/opt/anaconda3/lib/python3.7/site-packages (from requests>=2.20->openAI) (1.24.3)
Requirement already satisfied: chardet<3.1.0, >=3.0.2 in /Users/edisonhuinaizaca/opt/anaconda3/lib/python3.7/site-packages (from requests>=2.20->openAI) (3.0.4)
Requirement already satisfied: certifi<2017.4.17 in /Users/edisonhuinaizaca/opt/anaconda3/lib/python3.7/site-packages (from requests>=2.20->openAI) (2019.11.28)
Requirement already satisfied: idna<2.9, >=2.5 in /Users/edisonhuinaizaca/opt/anaconda3/lib/python3.7/site-packages (from requests>=2.20->openAI) (2.8)
Building wheels for collected packages: openAI
  Building wheel for openAI (setup.py) ... done
Created wheel for openAI: filename=openai-0.2.4-py3-none-any.whl size=170706 sha256=e2db2948b2f441328514738df7457d8722c51a93480792ac3c22554c199919
Stored in directory: /Users/edisonhuinaizaca/Library/Caches/pip/wheels/0b/08/b7/ac5e799acddceb3b8bff44ff681cc7626080a77fae8b56f
Successfully built openAI
Installing collected packages: openAI
Successfully installed openAI-0.2.4
Captura de Pantalla
```

### 3. Instalación de librería GYM

```
In [8]: from easyAI import TwoPlayersGame, Human_Player, AI_Player, Negamax
import numpy as np

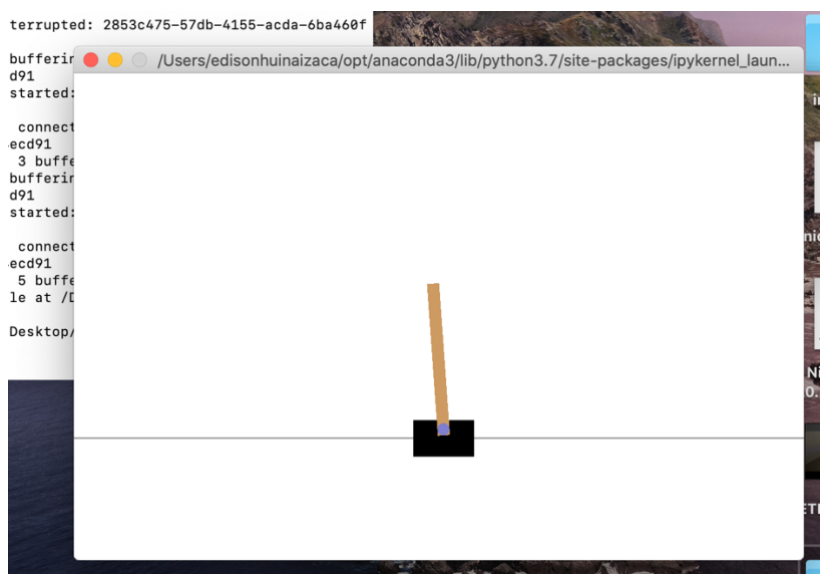
In [14]: !pip install gym

Collecting gym
  Downloading gym-0.17.2.tar.gz (1.6 MB)
    |██████████| 1.6 MB 1.1 MB/s eta 0:00:01
Requirement already satisfied: scipy in c:\users\edison\anaconda3\lib\site-packages (from gym) (1.4.1)
Requirement already satisfied: numpy>=1.10.4 in c:\users\edison\anaconda3\lib\site-packages (from gym) (1.18.1)
Collecting pygame<1.5.0, >=1.4.0
  Downloading pygame-1.5.0-py2.py3-none-any.whl (1.0 MB)
    |██████████| 1.0 MB 1.1 MB/s eta 0:00:01
Requirement already satisfied: cloudpickle<1.4.0, >=1.2.0 in c:\users\edison\anaconda3\lib\site-packages (from gym) (1.3.0)
Requirement already satisfied: future in c:\users\edison\anaconda3\lib\site-packages (from pygame<=1.5.0, >=1.4.0->gym) (0.18.2)
Building wheels for collected packages: gym
  Building wheel for gym (setup.py): started
  Building wheel for gym (setup.py): finished with status 'done'
Created wheel for gym: filename=gym-0.17.2-py3-none-any.whl size=1650896 sha256=e2db2948b2f441328514738df7457d8722c51a93480792ac3c22554c199919
Stored in directory: c:\users\edison\appdata\local\pip\cache\wheels\18\1e\58\89a2aa24e6c2cc800204fc02010612afdf200926c4d6bfe315
Successfully built gym
Installing collected packages: pygame, gym
Successfully installed gym-0.17.2
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```

## Prueba del las librerías

```
In [29]: import gym
env = gym.make('CartPole-v0')
for i_episode in range(20):
    observation = env.reset()
    for t in range(100):
        env.render()
        print(observation)
        action = env.action_space.sample()
        observation, reward, done, info = env.step(action)
        if done:
            print("Episode finished after {} timesteps".format(t+1))
            break
    env.close()

[2020-07-17 18:04:21.673] Making new env: CartPole-v0
[[-0.00399042 -0.02422285  0.01217733 -0.01324063]
 [-0.00447487  0.17072237  0.01191251 -0.30205673]
 [-0.00106043 -0.02456732  0.00587138 -0.00564078]
 [-0.00155177  0.17046994  0.00575856 -0.29646545]
 [ 0.00185763 -0.02473363 -0.00017075 -0.00197194]
 [ 1.36295438e-03 -2.19853133e-01 -2.10184026e-04  2.90657105e-01]
 [-0.00303411 -0.41497209  0.00560296  0.58327173]
 [-0.01133355 -0.21992908  0.01724843  0.29236107]
 [-0.01573213 -0.41529293  0.02311565  0.59043983]
 [-0.02403799 -0.22050213  0.03492445  0.30512708]
 [-0.02844803 -0.02589483  0.04102699  0.02365984]
 [-0.02896593 -0.22158039  0.04150019  0.32899974]
 [-0.03339754 -0.41726781  0.04444444  0.44444444]
 [-0.04174289 -0.61302628  0.06  Captura de Pantalla ]
 [-0.05400342 -0.41877357  0.07960778  0.66891827]
```



## OpenAI Gym

Tiene tres categorías de aprendizaje: **son supervisadas, no supervisadas y de refuerzo.**

- En el aprendizaje supervisado Intentamos predecir un valor objetivo o una clase donde los datos de entrada para el entrenamiento ya tienen etiquetas asignadas.
- En el aprendizaje no supervisado utiliza datos no etiquetados para observar patrones para hacer clusters, PCA o detección de anomalías.
- En los algoritmos RL son procedimientos de optimización para encontrar los mejores métodos para obtener la máxima recompensa, es decir, dar una estrategia ganadora para alcanzar el objetivo, **por refuerzo.**

## OpenAI Universe

Una de las características de Universe, es su aplicabilidad al mundo real. Es muy fácil obtener puntos de referencia del rendimiento humano en este tipo de tareas. Jugar un juego de **computadora o navegar** por la web es mucho menos

complicado que pedirle a un grupo de muestra que etiquete árboles, autos y nubes en imágenes.

### **Conclusiones:**

En conclusión, se puede decir que este software permite que un agente de IA tenga ciertas características que permiten el control de un sistema

### **Bibliografía**

<https://openai.com/blog/universe/>

<https://towardsdatascience.com/reinforcement-learning-with-openai-d445c2c687d2>

<https://openai.com/blog/universe/>