

人工知能応用の種々の例

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訓練（学習）データに応じた 機械学習プログラムの自動生成も



```
from tpot import TPOTClassifier
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split

# Load iris dataset
iris = load_iris()

# Split the data
X_train, X_test, y_train, y_test = train_test_split(iris.data, iris.target,
                                                    train_size=0.75, test_size=0.25)

# Fit the TPOT classifier
tpot = TPOTClassifier(verbose=2, max_time_mins=2)
tpot.fit(X_train, y_train)

# Export the pipeline
tpot.export('tpot_iris_pipeline.py')
```

機械学習プログラムを
生成するためのプログラム

```
import numpy as np
import pandas as pd
from sklearn.kernel_approximation import RBFSampler
from sklearn.model_selection import train_test_split
from sklearn.pipeline import make_pipeline
from sklearn.tree import DecisionTreeClassifier

# NOTE: Make sure that the class is labeled 'target' in the data file
tpot_data = pd.read_csv('PATH/TO/DATA/FILE', sep='COLUMN_SEPARATOR', dtype=np.float64)
features = tpot_data.drop('target', axis=1).values
training_features, testing_features, training_target, testing_target = \
    train_test_split(features, tpot_data['target'].values, random_state=None)

# Average CV score on the training set was:0.9913043478260869
exported_pipeline = make_pipeline(
    RBFSampler(gamma=0.25),
    DecisionTreeClassifier(criterion="entropy", max_depth=10, min_samples_leaf=3, min_samples_split=14)
)

exported_pipeline.fit(training_features, training_target)
results = exported_pipeline.predict(testing_features)
```

生成された
機械学習プログラム

<https://pypi.org/project/TPOT/>

画像の「どの部分」を使って、予測値を高めたのかをプロットする技術



<https://github.com/slundberg/shap#sample-notebooks>

<https://pypi.org/project/shap/>

機械学習で問題となる，データの乱れを洗浄するソフトウェア



10	JaMES	M\$\$ax%%well	875	taco
11	Isaac	Newton	992	pasta
12	Emmy%%	Nöether\$	234	pasta
13	Max!!!	Planck!!!	111	hamburguer
14	Fred	Hoy&&&le	553	pizza



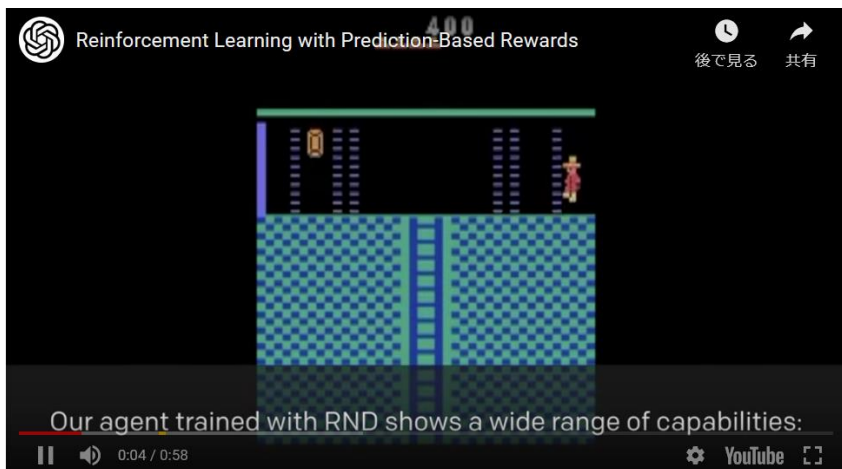
10	james	maxwell	875	taco
11	isaac	newton	992	pasta
12	emmy	noether	234	pasta
13	max	planck	111	hamburguer
14	fred	hoyle	553	pizza

- <https://pypi.org/project/optimuspyspark/>

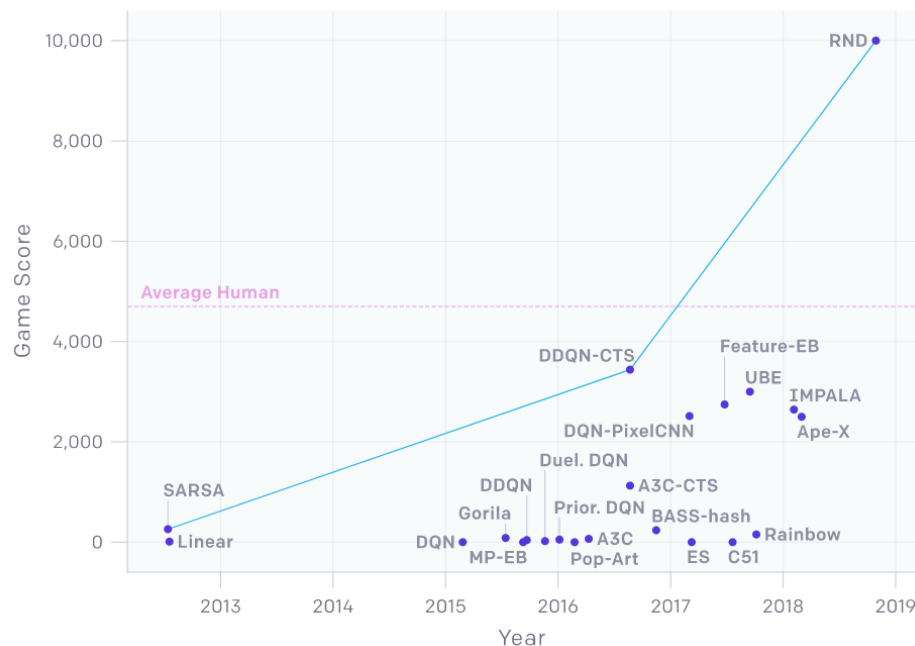


ニュース：強化学習は、ビデオゲーム
Montezuma's Revenge で、人間の平均を上まわる
スコアを出した（2018年12月）

<https://openai.com/blog/reinforcement-learning-with-prediction-based-rewards/>



Progress in Montezuma's Revenge

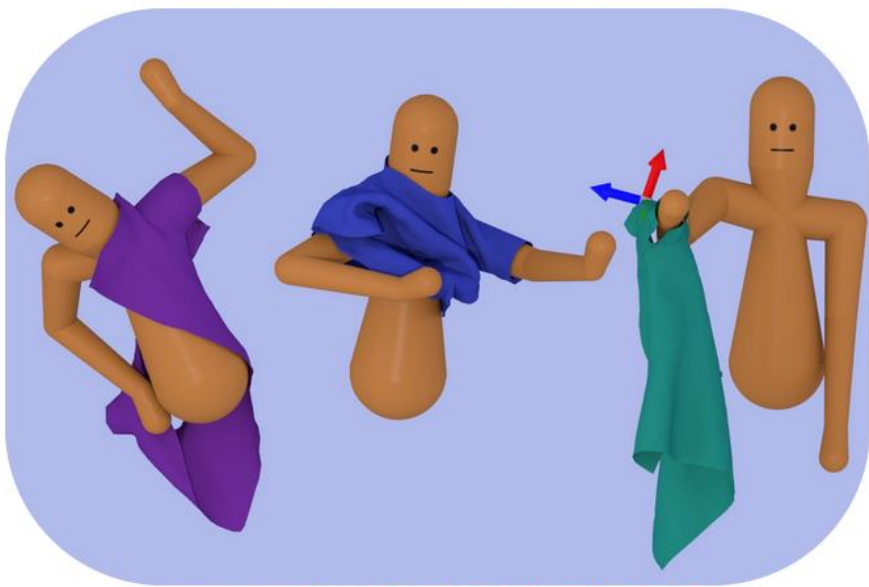


強化学習での Montezuma's Revenge
スコアの進展

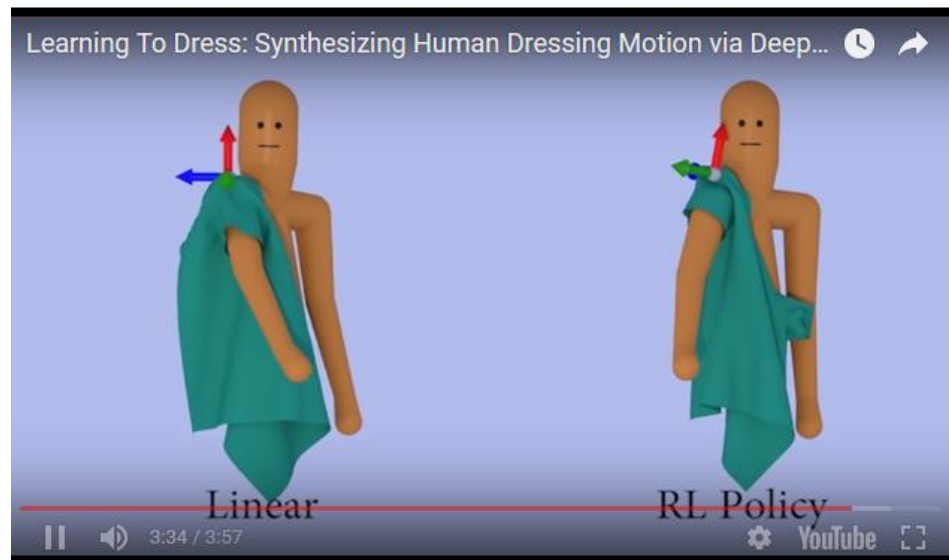


強化学習により，人間の着替え動作のシミュレーションに成功（2018年）

<https://www.cc.gatech.edu/~aclegg3/projects/LearningToDress.html>



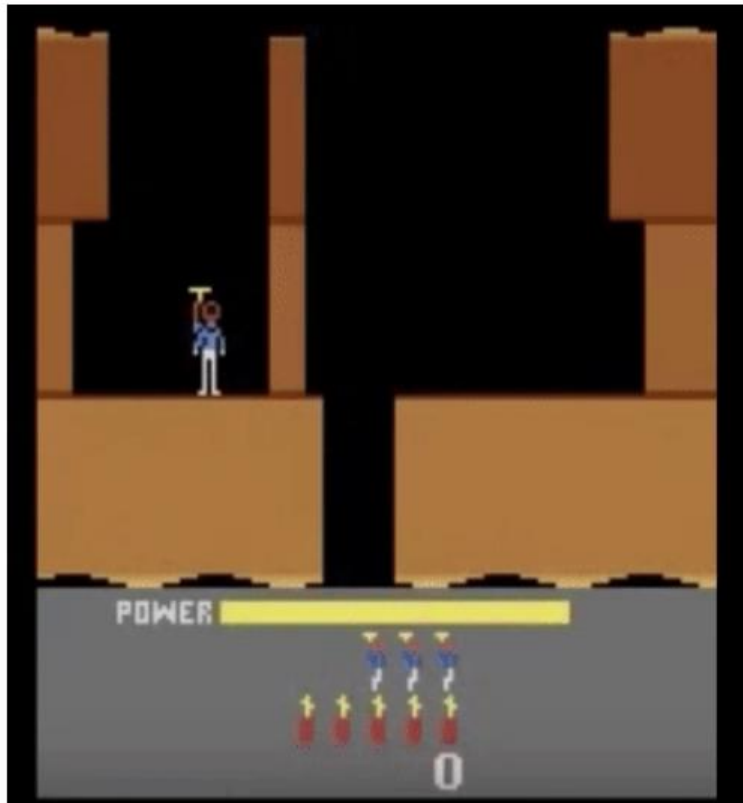
Alexander Clegg, [Wenhao Yu](#), [Jie Tan](#), [C. Karen Liu](#), [Greg Turk](#)
SIGGRAPH Asia 2018 | Preprint





人工知能の団体 OpenAI が、深層学習のプログラム・ソースコードを公開

<https://github.com/openai/baselines>



The screenshot shows the GitHub repository page for `openai/baselines`. The repository is described as "high-quality implementations of reinforcement learning algorithms". It has 330 commits, 32 branches, 0 releases, and 104 contributors. The repository is licensed under MIT. The commit history is as follows:

Commit	Message	Time ago
cyfra and pzhokhov	Updating the version to 0.1.6 (#933)	3 days ago
baselines	add log_path flag to command line utility (#917)	20 days ago
data	HER : new functionality, enables demo based training (#474)	8 months ago
docs/viz	Update viz.ipynb	8 months ago
benchmark_pattern	refactor a2c, acer, acktr, ppo2, deepq, and trpo_mpi (#490)	11 months ago
gitignore	refactor a2c, acer, acktr, ppo2, deepq, and trpo_mpi (#490)	11 months ago
.travis.yml	release Internal changes (#895)	2 months ago
Dockerfile	Add video recorder (#666)	8 months ago
LICENSE	Initial commit	2 years ago
README.md	add log_path flag to command line utility (#917)	20 days ago
benchmarks_atari10M.htm	fix commit on atari bms page to point to a public commit	3 months ago
benchmarks_mujoco1M.htm	Publish benchmark results (#502)	11 months ago
setup.cfg	run test_monitor through pytest; fix the test, add flake8 to bench di...	27 days ago
setup.py	Updating the version to 0.1.6 (#933)	3 days ago