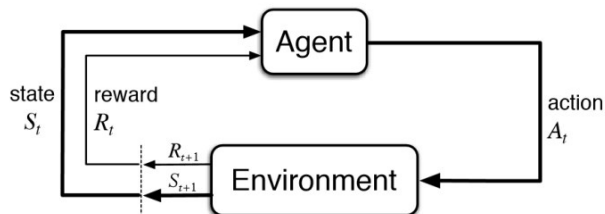


# Reinforcement Learning

## MARKET NEED

- Reinforcement Learning (RL) is a machine learning paradigm whereby an agent learns to take actions in its environment to maximise a reward.



- RL is not yet widely used within industry or in many real world applications, but it shows promise for addressing many challenges ranging from energy conservation to autonomous driving.

## TECHNOLOGY SOLUTION

- CeADAR's Reinforcement Learning project provides a state-of-the-art report on RL as well as a demonstrator application that demonstrates how RL can be applied in a financial trading scenario.
- The aim of the project is to help industry partners to understand the capabilities of RL and to identify scenarios in which it may be applied.

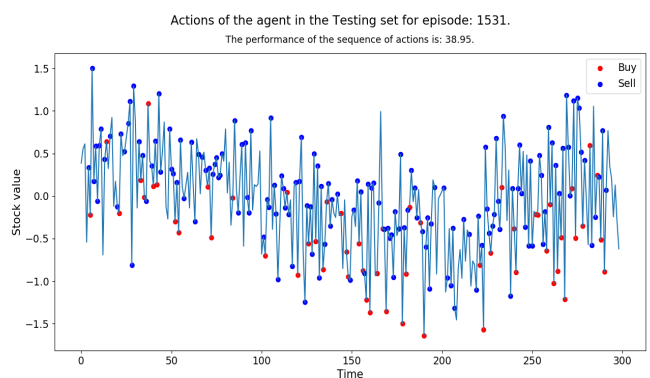
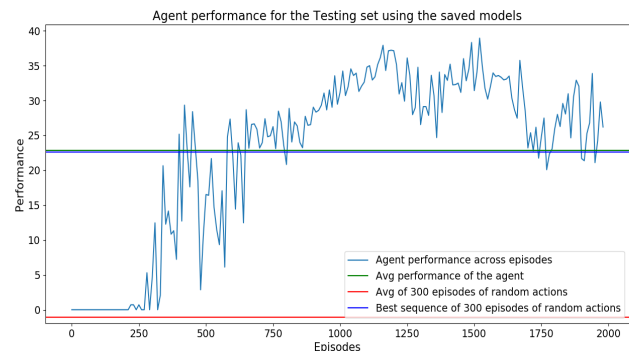
## KEY FEATURES

The key features of the demonstrator are:

- Data set and parameter configuration:** the user can upload their own time series dataset and configure the parameters and rewards for the DQN (Deep Q-Learning) algorithm.

CURRENT STATUS:	AGENT CONFIGURATION:	REWARD CONFIGURATION:
Current time 00:00:07 for 13 episodes.	Window Size 30	Buying Reward 0
Expected time left 00:12:02	Episode Count 1000	Holding Reward 0
Completed 1% of the process.	Batch Size 50	Selling Reward 10
Episodes 13 of 1000.	Minimum epsilon factor 0.05	Negative Selling Reward False
	Epsilon factor decay 0.99	
	Gamma (Discount factor) 0.95	
	Learning Rate 0.10	

- Experiment overview:** the effects of different parameters can be observed in terms of performance, training time, agent behaviour etc.



## CONCLUSION

- RL is still in the early stages of adoption within the industry. CeADAR's Reinforcement Learning project aims to provide an understanding of the technology, it's advantages and where it can be applied.