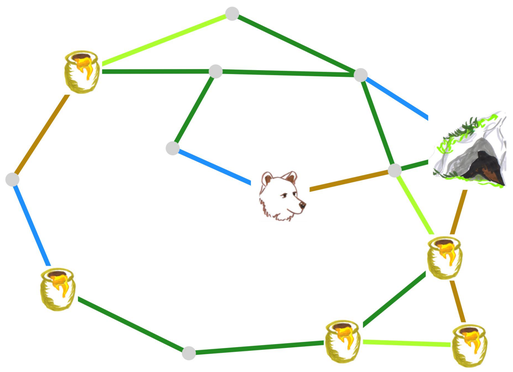
EasyAgents: Reinforcement Learning for people who want to solve real-world problems

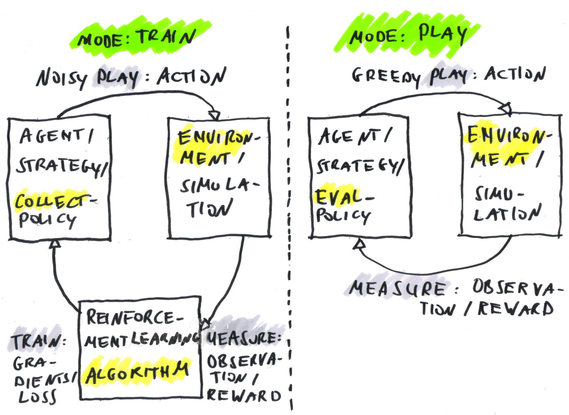
Christian Hidber / Oliver Zeigermann

Reinforcement Learning - Bears have problems too

Our bear Orso lives in his cave and each morning tries to get to all the honey with the least amount of effort possible.



Reinforcement Learning finds the best strategy for our lazy bear

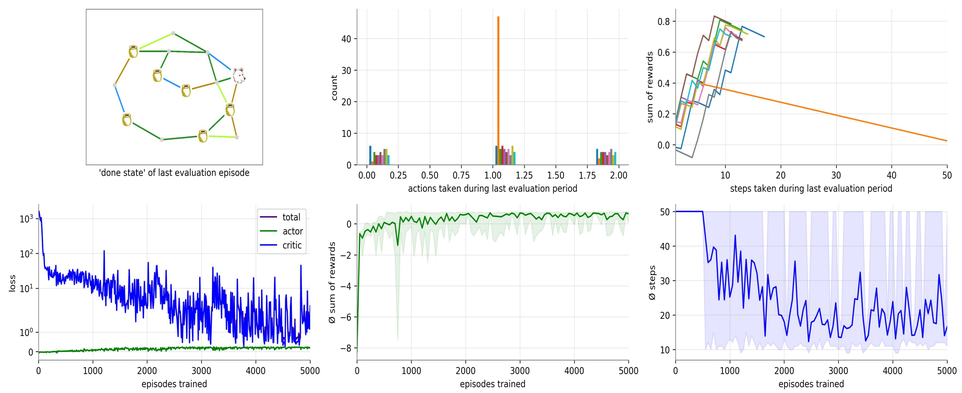


Simplified API and Plots

Environments are defined with OpenAI gym and can be used for training with a few lines of code. You can choose from a variety of learning algorithms

```
ppoAgent = PpoAgent( 'Orso-v1' )
ppoAgent.train( [plot.State(), plot.Loss(), plot.Rewards(), plot.Actions(),
                 plot.StepRewards(), plot.Steps()], num_iterations = 500 )
```

A configurable set of dynamic plot shows the progress of the training at any time



Once training has finished a simple score method will inform you of the performance of the trained policy

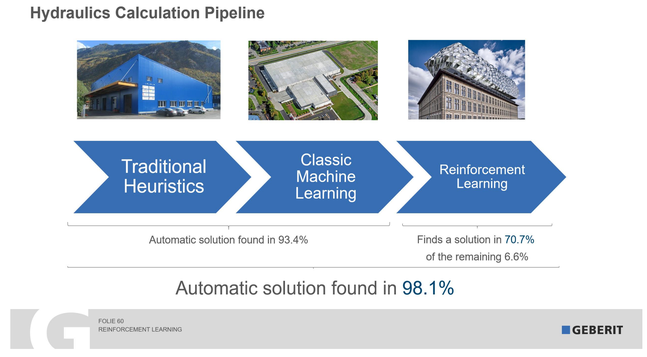
```
mean_r, std_r, min_r, max_r, all_r = ppoAgent.score()
0.58, 0.34, -0.67, 0.79
```

And finally you can use your trained policy to solve the bears daily changing chores and get a movie of the steps taken:

```
ppoAgent.play( [plot.State(), plot.ToMovie()] )
```

Industrial Applications

Geberit uses EasyAgents to solve the hydraulics control problem for syphonic roof drainage systems (no feasable deterministic algorithm is known):



Plugable Backends

EasyAgents is an abstraction layer over other more low-level reinforcement learning libraries, like Keras is for low-level TensorFlow.

algorithm	tf-Agents	tensorforce	keras-rl	easyagents class name
CEM	not available	not available	yes	CemAgent
Dqn	yes	yes	yes	DqnAgent
Double Dqn	open	not available	yes	DoubleDqnAgent
Dueling Dqn	not available	not yet available	yes	DuelingDqnAgent
Ppo	yes	yes	not available	PpoAgent
Random	yes	yes	not available	RandomAgent
REINFORCE	yes	yes	not available	ReinforceAgent
SAC	preview	not available	not available	SacAgent

https://github.com/christianhidber/easyagents