Kiel University
Christian-Albrechts-Universität zu Kiel

Exercise Sheet 4
Autonomous Learning
June 30, 2020

The Assignment 4 is not mandatory for the exam but contains valuable exercises.

Task 1 - Policy Gradient

A. Extend your agent with a policy gradient learning component.

B. Use a neural network with the following layers:

   (a) Input Layer
   (b) 1 Hidden Layer (128 Knoten + Relu)
   (c) 1 Hidden Layer (256 Knoten + Relu)
   (d) 1 Output Layer (8 Knoten + Softmax)

C. As Input use only the x- and y- distance from the marine to the beacon.

   - Normalise your input to the range $[-1, 1]$

D. Use a learning rate of $\alpha = 0.00025$

E. The agent receives after every action the folowing reward:

   - $+100$ if it reaches the beacon
   - -0.1 otherwise

F. Use a gamma of $\gamma = 0.99$

G. Use a screen size of $screen\_size = 16$

H. Visualise the learning process as usual

I. Again implement a learning module (TrainPG.py), where the agent initialise a new neural network, and a module (RunPG.py) running the agent without learning.