



English Title

Deutscher Titel

Nikkel Mollenhauer

Universitätsbachelorarbeit zur Erlangung des akademischen Grades

Bachelor of Science (B. Sc.)

im Studiengang IT-Systems Engineering

eingereicht am 30. Juni 2022 am
Fachgebiet Enterprise Platform and Integration Concepts der
Digital-Engineering-Fakultät
der Universität Potsdam

Gutachter Dr. Rainer Schlosser

Betreuer Johannes Huegle

Alexander Kastius

Abstract

Zusammenfassung

Acknowledgments

Contents

Al	ostra	t	iii
Zι	ısam	nenfassung	v
Ad	cknov	ledgments	vii
Co	onten	ts ·	ix
1	Intr	oduction	1
	1.1	Explaining the background	1 1 1 1
	1.2	What we want to offer with our framework	1
2	Rela	ted Work	3
	2.1	Approaches to evaluating RL-agents	3 3 3
3	Wh	t makes a good agent?	5
	3.1 3.2 3.3	Good agent = high profit, few outliers	5 5 5 5 5
4	Diff	erent approaches	7
	4.1	During vs. After training	7
	4.2	Tensorboard? (Not built by us)	7
	4.3	Macro	7
		4.3.1 Agent-monitoring	7 7

	4.4	Micro 4.4.1	Exampleprinter	7 7
	4.5	Static 4.5.1	Policyanalyzer	7 7
5	Our	workf	low	9
	5.1	Trainii	ng continuously saves models	9
		5.1.1 5.1.2	Automatic monitoring at certain intervals	9
			this?	9
		5.1.3	First analysis if available with finished training	9
	5.2	Manua	ll invocation of monitoring functionalities	9
		5.2.1	When is this necessary/a good idea? Why?	9
6	Inte	rpretin	g the results	11
	6.1	Graph	s and diagrams are available	11
		6.1.1	comparing with other agents/models	11
		6.1.2	which hyperparameters influence the results in what ways?	11
		6.1.3	can we augment e.g. Grid-Search with our analysis?	11
		6.1.4	-> Would need to make results "machine-readable" again .	11
7	Con	clusion	s & Outlook	13
Bi	bliog	raphy		15
De	eclara	ntion of	Authorship	17

1 Introduction

1.1 Explaining the background

- 1.1.1 Agents to be trained for real-world use
- 1.1.2 Training in an isolated environment
- 1.1.3 Need to make sure they are "good"
- 1.2 What we want to offer with our framework
- 1.2.1 Determining the grade of an agent using monitoring

- 2.1 Approaches to evaluating RL-agents
- 2.1.1 ...on the fly (while training)
- 2.1.2 ...after training has finished

- 3.1 Good agent = high profit, few outliers
- 3.2 Overview of market components
- 3.2.1 Focus on how agents make profit etc.
- 3.3 How realistic the market is
- 3.3.1 Restrictions for evaluation arising from this

Different approaches

- 4.1 During vs. After training
- 4.2 Tensorboard? (Not built by us)
- 4.3 Macro
- 4.3.1 Agent-monitoring
- 4.3.2 Live-monitoring
- 4.4 Micro
- 4.4.1 Exampleprinter
- 4.5 Static
- 4.5.1 Policyanalyzer

- 5.1 Training continuously saves models
- 5.1.1 Automatic monitoring at certain intervals
- 5.1.2 -> Can we discard agents prematurely due to results from this?
- 5.1.3 First analysis if available with finished training
- 5.2 Manual invocation of monitoring functionalities
- 5.2.1 When is this necessary/a good idea? Why?

Interpreting the results

- 6.1 Graphs and diagrams are available...
- 6.1.1 ...comparing with other agents/models
- 6.1.2 ...which hyperparameters influence the results in what ways?
- 6.1.3 ...can we augment e.g. Grid-Search with our analysis?
- 6.1.4 -> Would need to make results "machine-readable" again

Bibliography

Declaration of Authorship

I hereby declare that this thesis is my own unaided work. All direct or indirect sources used are acknowledged as references.							
Potsdam, 30th March 2022	Nikkel Mollenhauer						