

# Neural Networks and their Application in Reinforcement Learning

Reinforcement Learning Seminar – Winter Semester 2018/19

Fabian Otto

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**Abstract** Insert your abstract here. Include keywords, PACS and mathematical subject classification numbers as needed.

**Keywords** Reinforcement Learning · Neural Networks

## 1 Introduction

Give introduction with NN hype or similar things. As well as the importance. Define RL and the method in general. Show clear distinction to SL. Maybe include success of recent things in CV and NLP, might also be possible in 3 to transition to more recent approaches in RL.

## 2 Definition of Neural Networks

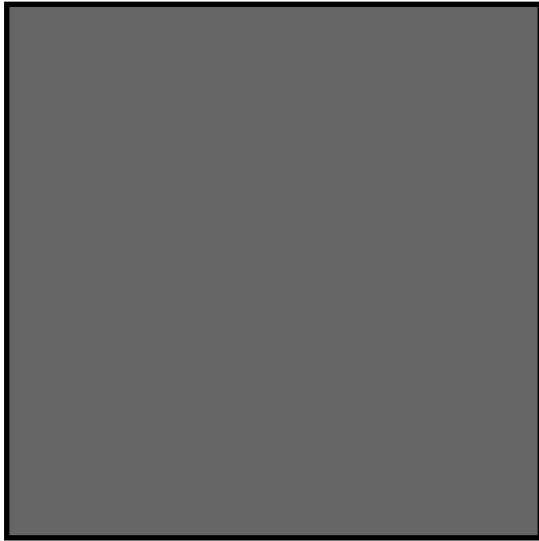
[?] and [?]. Describe formally how NN are working, how can they be trained, what other methods do we have, etc.

## 3 History of Neural Networks

(see Sect. ??). What did lead to the rise and fall of NNs throughout time. Create good transition to recent approaches.

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Fabian Otto  
Technische Universität Darmstadt, Computer Science Department  
E-mail: fabian.otto@stud.tu-darmstadt.de



**Fig. 1** Please write your figure caption here

**Table 1** Please write your table caption here

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## 4 Recent Approaches in Reinforcement Learning

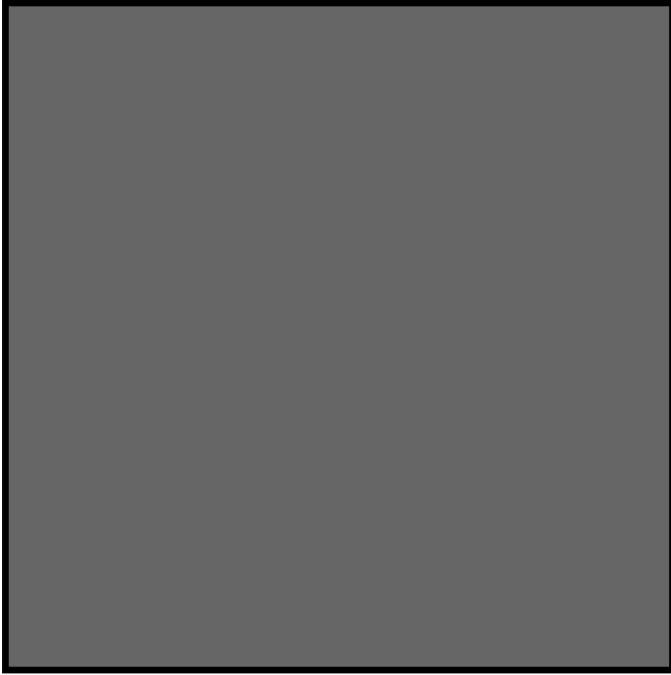
### 4.1 Algorithms

### 4.2 Application Areas

Talk about DeepMinds AlphaZero, TDGammon, Atari Game Systems, e.g. Minh But also applications outside of Games, maybe seperate this into two different subsections.

*Paragraph headings*

$$a^2 + b^2 = c^2 \tag{1}$$



**Fig. 2** Please write your figure caption here