

# Artificial Intelligence

## Section 1

1. Why AI?
2. Introduction
3. How to get data from practice
4. Some Additional Resources!!

## Section 2: Reinforcement Learning

5. Fundamentals of Reinforcement Learning

## Section 3: Q-Learning Intuition

6. Plan of Attack
7. What is reinforcement learning?
8. The Bellman Equation
9. The "Plan"
10. Markov Decision Process
11. Policy vs. Plan
12. Adding a "Living Penalty"
13. Q-Learning Intuition
14. Temporal Difference
15. Q-Learning Visualization

### Section 4: Self-Driving Car (Deep Q-Learning) part 1

16. Part 1 - An Introduction how Self-Driving Car Works (Deep Q-Learning)

## Section 5: Deep Q-Learning Intuition

17. Plan of Attack
18. Deep Q-Learning Intuition - Learning
19. Deep Q-Learning Intuition - Acting
20. Experience Replay

21. Action Selection Policies

## **Section 6: Installation for Part 1**

22. Plan of Attack (Practical Tutorials)

23. Where to get the Materials

24. Windows Option 1: End-to-End installation steps

25. Windows Option 2 - Part A: Installing Ubuntu on Windows

26. Windows Option 2 - Part B: Installing PyTorch and Kivy on your Ubuntu VM

27. Mac or Linux: Installing Anaconda

28. Mac or Linux: Installing PyTorch and Kivy

29. Common Debug Tips

30. Getting Started

## **Section 7: Creating the environment**

31. Self Driving Car - Step 1

32. Self Driving Car - Step 2

## **Section 8: Building an AI**

33. Self Driving Car - Step 3

34. Self Driving Car - Step 4

35. Self Driving Car - Step 5

36. Self Driving Car - Step 6

37. Self Driving Car - Step 7

38. Self Driving Car - Step 8

39. Self Driving Car - Step 9

40. Self Driving Car - Step 10

41. Self Driving Car - Step 11

42. Self Driving Car - Step 12

43. Self Driving Car - Step 13

44. Self Driving Car - Step 14

45. Self Driving Car - Step 15

46. Self Driving Car - Step 16

### **Section 9: Playing with the AI**

47. Self Driving Car - Level 1

48. Self Driving Car - Level 2

49. Self Driving Car - Level 3

50. Self Driving Car - Level 4

51. Challenge Solutions

### **Section 10: Doom (Deep Convolutional Q-Learning)**

52. What are convolutional neural networks and Convolutional Q-Learning

### **Section 11: Deep Convolutional Q-Learning Intuition**

53. Plan of Attack

54. Deep Convolutional Q-Learning Intuition

55. Eligibility Trace

### **Section 12: Installation for Part 2**

56. Where to get the Materials

57. Installing Open AI Gym and ppaquette

58. Installing Open AI Gym Walk through (Mac Version)

59. Installing Open AI Gym Walk through (Ubuntu Version)

60. Common Debug Tips

### **Section 13: Building an AI**

61. Doom - Step 1

62. Doom - Step 2

63. Doom - Step 3

- 64. Doom - Step 4
- 65. Doom - Step 5
- 66. Doom - Step 6
- 67. Doom - Step 7
- 68. Doom - Step 8
- 69. Doom - Step 9
- 70. Doom - Step 10
- 71. Doom - Step 11
- 72. Doom - Step 12
- 73. Doom - Step 13
- 74. Doom - Step 14
- 75. Doom - Step 15
- 76. Doom - Step 16
- 77. Doom - Step 17

#### **Section 14: Playing with the AI**

- 78. Watching our AI play Doom

#### **Section 15: A3C**

- 79. Introduction

#### **Section 16: A3C Intuition**

- 80. Plan of Attack
- 81. The three A's in A3C
- 82. Actor-Critic
- 83. Asynchronous
- 84. Advantage
- 85. LSTM Layer

## **Section 17: Installation for Part 3**

86. Installing OpenCV

## **Section 18: Building an AI**

87. Breakout - Step 1

88. Breakout - Step 2

89. Breakout - Step 3

90. Breakout - Step 4

91. Breakout - Step 5

92. Breakout - Step 6

93. Breakout - Step 7

94. Breakout - Step 8

95. Breakout - Step 9

96. Breakout - Step 10

97. Breakout - Step 11

98. Breakout - Step 12

99. Breakout - Step 13

100. Breako - Step 14

101. Breakout - Step 15

## **Section 19: Artificial Neural Networks**

102. What is Deep Learning?

103. Plan of Attack

104. The Neuron

105. The Activation Function

106. How do Neural Networks work?

107. How do Neural Networks learn?

108. Gradient Descent

109. Stochastic Gradient Descent

110. Backpropagation

## Section 20: Convolutional Neural Networks

111. Plan of Attack

112. What are convolutional neural networks?

113. Step 1 - Convolution Operation

114. Step 1(b) - ReLU Layer

115. Step 2 - Pooling

116. Step 3 - Flattening

117. Step 4 - Full Connection

118. Summary

119. Softmax & Cross-Entropy

-> **More and more you will learn in Deep learning Course.**

-> **Last two sections, are just how much is required prerequisites for Artificial Intelligence.**