

AI Poker Tutorial

Max Chiswick

2024-09-11

Table of contents

1	AI Poker Tutorial	7
I	INTRO	8
2	Why Poker?	10
3	Poker Camp	11
4	Problem Solving	12
5	Games	13
6	Basic Strategy	14
7	Ethical Considerations	15
II	CODING FOUNDATIONS	16
8	Python	18
9	AI Agents	19
10	Building AI Agents	20
III	MATH FOUNDATIONS	21
11	Algebra	23
12	Probability	24
13	Combinatorics	25
14	Expected Value	26
15	Bayes' Rule	27

16 Statistics	28
17 Monte Carlo Methods	29
 IV KNOWLEDGE	 30
18 Logic	32
19 Knowledge Representation	33
20 Rationality	34
21 Psychology and Mindset	35
 V DECISION MAKING UNDER UNCERTAINTY	 36
22 Probabilistic Thinking	38
23 Decision Theory	39
24 Risk	40
25 Regret	41
26 Multi-armed Bandits	42
 VI GAME THEORY	 43
27 Nash Equilibrium	45
28 Game Theory Optimal (GTO)	46
29 Mixed Strategies	47
 VII GAME TREES	 48
30 Perfect Information	50
31 Minimax	51
32 Imperfect Information Games	52

VIII SOLVING TOY GAMES	53
33 Analytical Solutions	55
34 Normal Form	56
35 Optimization	57
36 Sequence Form	58
IX COUNTERFACTUAL REGRET MINIMIZATION (CFR)	59
37 CFR Algorithm	61
38 CFR Interactive	62
39 CFR Proof	63
40 CFR Algorithm Improvements	64
41 Monte Carlo CFR	65
42 Vector CFR	66
X ABSTRACTING LARGE GAMES	67
43 Game Size	69
44 Card Abstraction	70
45 Bet Abstraction	71
46 Agent Evaluation	72
XI POKER SOLVERS	73
47 How Solvers Work	75
48 Using Solvers	76
49 Generalizing Solver Outputs	77
50 Studying Populations	78

51 Solver Limitations	79
52 Advanced Strategy	80
53 Tournaments	81
XII AI MATH	82
54 Calculus	84
55 Linear Algebra	85
56 Information Theory	86
XIIIAI FOUNDATIONS	87
57 Machine Learning	89
58 Deep Learning	90
59 Reinforcement Learning	91
XIVrecentgameaiadvances.qmd	92
60 Types of Games	93
61 Multi-agent Systems	94
XV STATE OF THE ART POKER AI	95
62 Deep CFR	97
63 Top Poker Agents	98
64 Variance Reduction	99
65 Human vs. AI	100
66 New Research	101

XVILLMS	102
67 Transformers	104
68 OthelloGPT	105
69 PokerGPT	106
70 Interpretability	107
XVIDPPONENT MODELING	108
71 Best Response	110
72 Exploitative Strategies	111
XVIAI RISKS AND SAFETY	112
73 Ethics and Short-term Risks	114
74 Alignment and Long-term Risks	115
XIXTHE RIVER	116
75 Trading	118
76 Prediction Marketes	119
77 Other Betting	120
XX PROJECT IDEAS	121
78 Projects	123

1 AI Poker Tutorial

New AIP T by [Poker Camp](#) coming soon.

Part I

INTRO

Hello

2 Why Poker?

Hello

3 Poker Camp

Hello

4 Problem Solving

Hello

5 Games

Hello

6 Basic Strategy

Hello

7 Ethical Considerations

Hello

Part II

CODING FOUNDATIONS

Hello

8 Python

Hello

9 AI Agents

Hello

10 Building AI Agents

Hello

Part III

MATH FOUNDATIONS

Hello

11 Algebra

Hello

12 Probability

Hello

13 Combinatorics

Hello

14 Expected Value

Hello

15 Bayes' Rule

Hello

16 Statistics

Hello

17 Monte Carlo Methods

Hello

Part IV

KNOWLEDGE

Hello

18 Logic

Hello

19 Knowledge Representation

Hello

20 Rationality

Hello

21 Psychology and Mindset

Hello

Part V

DECISION MAKING UNDER UNCERTAINTY

Hello

22 Probabilistic Thinking

Hello

23 Decision Theory

Hello

24 Risk

Hello

25 Regret

Hello

26 Multi-armed Bandits

Hello

Part VI

GAME THEORY

Hello

27 Nash Equilibrium

Hello

28 Game Theory Optimal (GTO)

Hello

29 Mixed Strategies

Hello

Part VII

GAME TREES

Hello

30 Perfect Information

Hello

31 Minimax

Hello

32 Imperfect Information Games

Hello

Part VIII

SOLVING TOY GAMES

Hello

33 Analytical Solutions

Hello

34 Normal Form

Hello

35 Optimization

Hello

36 Sequence Form

Hello

Part IX

COUNTERFACTUAL REGRET MINIMIZATION (CFR)

Hello

37 CFR Algorithm

Hello

38 CFR Interactive

Hello

39 CFR Proof

Hello

40 CFR Algorithm Improvements

Hello

41 Monte Carlo CFR

Hello

42 Vector CFR

Hello

Part X

ABSTRACTING LARGE GAMES

Hello

43 Game Size

Hello

44 Card Abstraction

Hello

45 Bet Abstraction

Hello

46 Agent Evaluation

Hello

Part XI

POKER SOLVERS

Hello

47 How Solvers Work

Hello

48 Using Solvers

Hello

49 Generalizing Solver Outputs

Hello

50 Studying Populations

Hello

51 Solver Limitations

Hello

52 Advanced Strategy

Hello

53 Tournaments

Hello

Part XII

AI MATH

Hello

54 Calculus

Hello

55 Linear Algebra

Hello

56 Information Theory

Hello

Part XIII

AI FOUNDATIONS

Hello

57 Machine Learning

Hello

58 Deep Learning

Hello

59 Reinforcement Learning

Hello

Part XIV

recentgameaiadvances.qmd

60 Types of Games

Hello

61 Multi-agent Systems

Hello

Part XV

STATE OF THE ART POKER AI

Hello

62 Deep CFR

Hello

63 Top Poker Agents

Hello

64 Variance Reduction

Hello

65 Human vs. AI

Hello

66 New Research

Hello

Part XVI

LLMS

Hello

67 Transformers

Hello

68 OthelloGPT

Hello

69 PokerGPT

Hello

70 Interpretability

Hello

Part XVII

OPPONENT MODELING

Hello

71 Best Response

Hello

72 Exploitative Strategies

Hello

Part XVIII

AI RISKS AND SAFETY

Hello

73 Ethics and Short-term Risks

Hello

74 Alignment and Long-term Risks

Hello

Part XIX

THE RIVER

Hello

75 Trading

Hello

76 Prediction Marketes

Hello

77 Other Betting

Hello

Part XX

PROJECT IDEAS

Hello

78 Projects

Hello