

Poker Agent

Tomer Dobkin

May 12, 2020

1 Introduction

the game Texas Hold'em Poker is a popular game, and it is also has vast of researches that their goal is to create good computer programs that play poker, we will use the term - poker agents.

A strong motivation to this researches is the fact that poker models are interesting use case of AI. the use case is a game with imperfect information (about the world) and element of chance.

1.1 Rules

taken from: Computer Poker - A review.

The game of Texas Hold'em is played in 4 stages – preflop, flop, turn and river. During the preflop all players at the table are dealt two hole cards, which only they can see. Before any betting takes place, two forced bets are contributed to the pot, i.e. the small blind and the big blind. The big blind is typically double that of the small blind. The player to the left of the big blind, known as under the gun, then begins the betting by either folding, calling or raising. The possible betting actions common to all variations of poker are described as follows:

Fold: When a player contributes no further chips to the pot and abandons their hand and any right to contest the chips that have been added to the pot.

Check/Call: When a player commits the minimum amount of chips possible in order to stay in the hand and continue to contest the pot. A check requires a commitment of zero further chips, whereas a call requires an amount greater than zero.

Bet/Raise: When a player commits greater than the minimum amount of chips necessary to stay in the hand. When the player could have checked, but decides to invest further chips in the pot, this is known as a bet. When the player could have called a bet, but decides to invest further chips in the pot, this is known as a raise. In a limit game all bets are in increments of a certain amount. In a no limit game players can wager up to the total amount of chips they possess in front of them. Once the betting is complete, as long as at least two players still remain in the hand, play continues on to the next stage. Each further stage involves the drawing of community cards from the shuffled deck of

cards as follows: flop – 3 community cards, turn – 1 community card, river – 1 community card. During each stage players combine their hole cards with the public community cards to form their best 5 card poker hand. Each stage also involves its own round of betting and play continues as long as there are players left who have not folded their hands. A showdown occurs after the river where the remaining players reveal their hole cards and the player with the best hand wins all the chips in the pot. If two or more players have the same best hand then the pot is split amongst the winners.

2 Litreture Review

The researches of poker are really rich and started way from (TODO complete) and are last to our days. there are competation of poker agents, the most famous one is Association for the Advancement of Artificial Intelligence (AAAI) Computer Poker Competition. the research are used of there from variaty of subjects from math and computer science:

1. AI
2. Game Theory

the first agent that won a human, a common comparison that is done when dealing with AI that play games (like with Chess and Deep Blue) , (TODO complete)