

# Rules for Quantum Go

Navigate the stream of possible realities in the hardest boardgame there is.

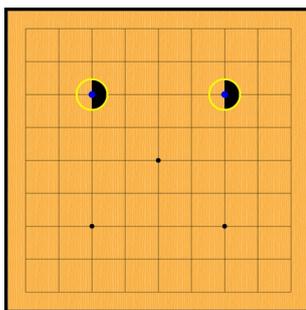
QuantumGo.net

In Quantum Go you play uncertain moves in a game of Go. A Quantum Go move creates a fork in the stream of possible realities. Whenever a capture on a possible reality occurs a measurement is taken, whether stones have been capture or not and if so which stones. In this case all possible realities are equally likely.

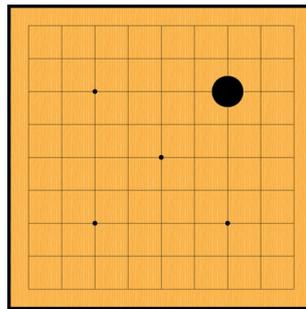
## 1. Play a move:

In Quantum Go (QGo) you can play a double move, a triple move or pass. When you play a move, you choose two or three locations on the board. For each possible reality, a new reality is created for each of the two or three locations, in which a move at this location is played (forking the stream of possible realities). Then all realities where this move was an illegal Go move are discarded.

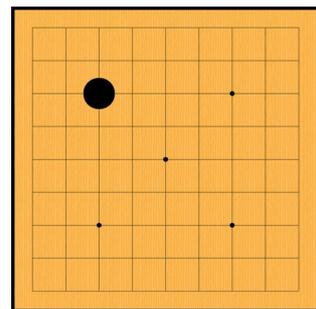
Example: Black played a double move on the upper left and right 3-3 point.



*Game Display*



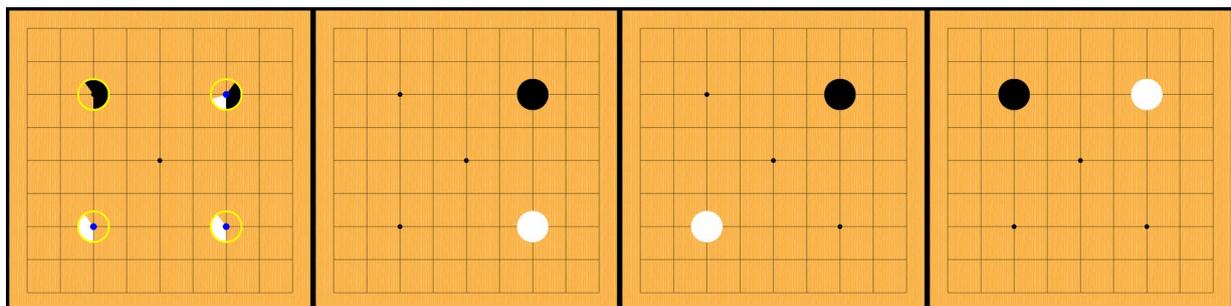
*Reality 1*



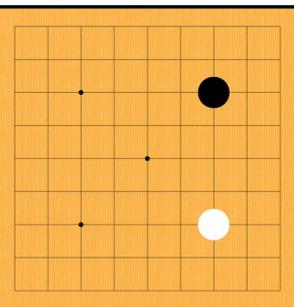
*Reality 2*

There are two realities. In half of the realities there is a black stone on the top left 3-3 point. The same is the case for the top right 3-3 point.

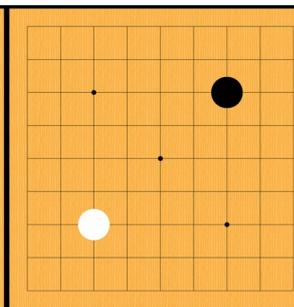
Then white plays a triple move on the top right, bottom right and bottom left 3-3 point.



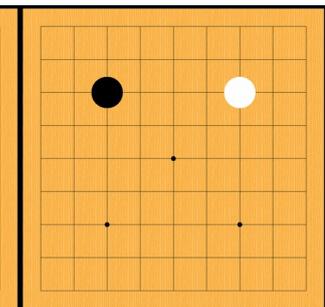
*Game Display*



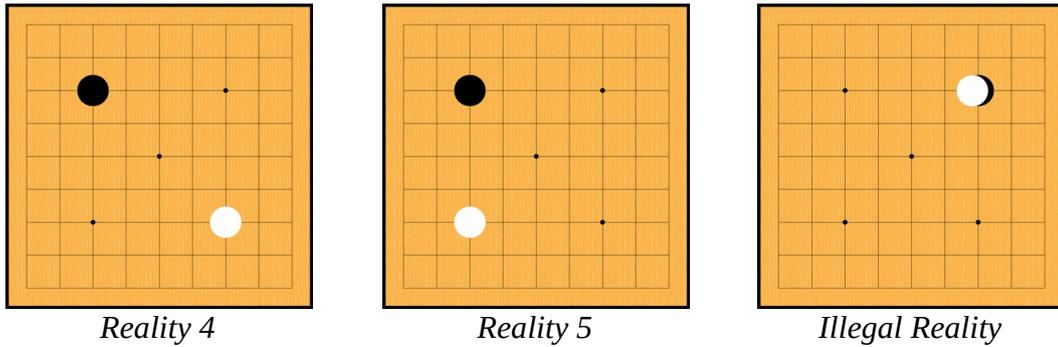
*Reality 1*



*Reality 2*



*Reality 3*



One of these realities is illegal, therefore there are 5 possible realities. Note that in more than half of the possible realities there is a black stone on the top left 3-3 point. White 'pushed' black's top right stone away.

## 2. Legal QGo move:

A QGo move is illegal, when this (non-passing) move already occurred in the game. This pertains to color and the set of locations.

Example: W-C3, E4. Then white can not play W-C3, E4 or W-E4, C3 again in this game. But black can play B-C3, E4 and white can play a triple move with these locations like W-E4, D3, C3 and white can play a move with one of these locations like W-C3, F2.

In addition a QGo move is illegal, when a play on one of the chosen locations is an illegal Go-move on all possible realities. (stone there, ko, suicide move)

Example: In all possible realities a stone is already present at this location.

When a player attempts to play an illegal move, they will unintentionally pass. This is so that you can not get free information on possible realities, where this move is a suicide move or an illegal ko move.

## 3. Measurement

After a player plays a non-passing QGo move, it is checked if there is a possible reality, in which a capture occurred with that last move. If that is the case, then a measurement takes place:

A possible reality is chosen randomly. All possible realities are equally likely.

If a capture occurred in the chosen reality, then a capture occurred with that QGo

move and all realities that do not have that exact same capture are discarded.

If no capture occurred in the chosen reality, then no capture occurred with that QGo move and all realities that have a capture are discarded.

#### 4. End of the Game

If both players pass and at least one did so intentionally, the board is determined down to one reality. All realities are equally likely to be chosen.

If a player passes and the last four moves are also passing moves (independent on intentionality), the board is determined down to one reality. Then the game is counted. The score of each player is equal to the number of stones they have on the board. White gets an additional 4 points of komi.

#### 5. Display

The following information is given to the players:

1. The total number of realities.
2. For each location on the board, the relative number of realities, where there is a black stone on that location, and the relative number of realities, where there is a white stone on that location, to the total number of realities. (proportion, not probability!)
3. If a measurement occurred and with which probability stones could have been captured.
4. If a capture occurred, and which locations on the board contained stones that were captured. (including probabilities for this and any capture)
5. The list of played moves. Including, if a measurement occurred, if a capture occurred, if the board was determined, and if this was an unintentional illegal move.

#### 6. Practicalities

The server only allows a certain maximum number of realities. When this number is exceeded the game gets determined down to one reality.

A player can request estimate counting, when only one possible reality exists. If the other player accepts, both players mark all dead stones. If they agree on that, the server gives an estimate of the final score. The QGo endgame can often be too

complicated to give a perfect estimate for the score. To make the estimator accurate, you need to fill dame, finish ko's, and play out all strange sekis.

The Game prevents you from playing QGo moves you already played, and from playing on location, which have a stone on all possible realities. Though you still need to track ko and suicide moves in the possible realities.

## 7. Comments

It should be noted, that this is not random Go. Where a player plays in random Go is determined at the time of the move, whereas in QGo it is determined at specific points in the game, that means (in most cases) not at the time of the move.

The number of white and black stones is equal on all possible realities.

There are no true sekis in the game. The player, who is behind, will always try and resolve all sekis. Thus the resulting score difference is always odd in all resolved positions and increases in komi make only sense in increments of 2, if jigo is avoided by both players.