# Humanistic Connotation in Xiangqi Game

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**Abstract.** Unlike Go, with a draw, Xiangqi opens its way to symmetry breaking of the game ending between win and loss, which is expressed emergence in the concept of the system evolution. The emergence of a game will increase humanistic spirit, leading to the sublimation of player's subjectivity, If Xiangqi game is placed in a round-robin system, which becomes a "multi-agent game", thus players fully show their inter-subjectivity. Putting a great investment of mental state by players, Xiangqi becomes about mental confrontation. In addition, Xiangqi shows her symmetry breaking in more aspects, as its pieces are of rich in humanity and artistry, so that players can fully demonstrate their individual personalities during playing. Finally, this paper discusses the limitations of AI that can express human subjectivity.

**Keywords:** human spirit, humanity values, complexity, symmetry-breaking, Xiangqi (Chinese chess), artificial intelligence (AI), subjectivity

## 1    Introduction

The starting point of this article is to respond to the two viewpoints raised by Go Master Weiping Nie 12 years ago[1]:

1)Xiangqi is simpler, while Go is more complex;

2)Xiangqi is of lower value, while Go is of higher value.

I hope to express it through the following detailed analysis: the game of Xiangqi has much more complex spiritual factors involved than that of Go. However, things of higher spirituality are usually difficult to be formalized and quantified, even by advanced AI. This shows that if we comprehensively compare the complexity of these two board games, they would be "like a chicken talking to a duck", "apples and oranges" also!

Mozi (Mo-tzu) , an ancient Chinese thinker in the Warring States period, once said: "Different kinds of things cannot be compared and inferred, as the standards of measurement are different."[2] We adopt Mozi's saying as a basis for game complexity theory. Despite it, what we could do is analysis their humanism in detail.

Due to higher similarity between Xiangqi and chess, the scene and idea where I discuss the complexity of the Xiangqi game can also be applied in general with chess, and I sometimes use the example of chess to describe Xiangqi, vice versa also.

## 2    Text

### 2.1    The asymmetric ending of Xiangqi game enhances humanities and artistry

For every Xiangqi player, there are three possible endings of a Xiangqi game: win, lose or draw, while there are only two of Go: either win or lose.

From the point of view of system theory, if a state of winning and losing results of a game is established and integrated as a "symmetry" from dynamic process, then such an establishment becomese a new characteristics, i.e. static state of higher level.   Draw or tie is the disintegration and deconstruction of this symmetry, which "the symmetry breaking" named, therefore, the system is thus bifurcated and stratified, that is, a new level of alienation is produced from the level of victory and defeat, and the system is promoted and sublimated. Breakage is a necessary and sufficient condition for a system evolution.

However, there is basically no draw in the game of Go. In professional Go games, the occurrence rate of draw is about: 1/4000, being too small to be taken into consideration. Now that hardly any high-level symmetry breaking exists, no strategic decision for a Go player to take, so that Go has rarely evolution to spiritual height.

Providing the possibility of a draw ending, Xiangqi game indicates players an opening system, under which a player enjoys a strategic decision choice, that is, win or draw. This strategic decision making process stimulates player's subjective freedom to be more spirituality, and vice versa, a player who enjoys more freedom would make his higher strategy of Xiangqi, far beyond the board level. Especially when the game goes through into the later stage of round robin tournament a player would raise game's strategy to the advanced level: subjective game, strategic game, multi-player game, etc. Under such a circumstance these game's scenarios above mentioned can be called "inter-subjectivity" or somethings relate with Cooley's looking-glass self theory. Even we borrow "the Symbolic Interaction Theory"[3], which holds that:

1)One's "self" can be recognized from the behavior of others towards "I", in other words, the behavior of others is a mirror of my "self" ;

2)To know myself, I must communicate with others." The "I" and "you" in the mirror are mirror images of each other.

Since Xiangqi game has the possibility to be raised its strategy to the level of inter-subjectivity, more spiritual factors would be involved in game: fighting wits, courage, tenacity, endurance, cunning, tricky, etc. The strategy making is the system function of giant fluctuation, i.e. the draw outcome certainly breaks the game's symmetric ending. As a result, Xiangqi tends to be of highly non-linear evolution, that is, become more mental complexity, which is described as a popular phrases among Xiangqi professional circle: "Playing Xiangqi means playing mentality!"

Liping Guo, a famous TV commentator on Xiangqi Game program, once had a meaningful statement: "Xiangqi is a game for adults, while Go is a game for juveniles." A good mentality of a Xiangqi player marks the maturity of his mind, which requires years of incubation and development before mature enough. It is generally believed that a person's psychological maturity will not fulfil until the age of a full adult, so this is a strong reason why only a few juveniles Xiangqi players reach the top level, but Go

game does so. Among the top Go players, it is commonplace that many teenagers to reach the professional top level.

There are a few examples to show successful prodigy in the Xiangqi professional circle: Ronghua Hu and Ming Hu won the national championship at the age of 15, and Dan Tang, Yinchuan Xu and Xinxin Zhao won the national championship at their age of 17, 18 and 19 respectively.

Zhe Li, a Go player who has studied philosophy at Peking University, confided: "I think that the simple win or loss of Go ending boosts little creation for humanity values."[4]

Hui Yang, a famous female Go player in the 1980s, said: "Go has its game theory only, but no style or genre." [5]

Since living in a value world, one's valuable behaviors and desires comes from his free will of subjectivity and lie in the interaction between the subject and the object, even inter-subject. The reason why Xiangqi game presents more subjective presence or "being" than Go is that it can provide the game player with a strategic choice: either a winning strategy or a draw strategy, thus entering into the strategic concept of blending with the opponent. The essence is that the game opens its "soul" to human subjectivity. So, while playing Xiangqi, a player can deeply understand what his "existence" lies on his own action.

In Martin Heidegger's existential philosophy, the expression "Da-sein" is used to refer to the experience of being that is particular to human beings. Moreover, another expression "In-der-Welt-sein" i.e. Being-in-the-world, is Dasein's essential embeddedness in an environing world. "My existence" has the characteristics of "I belong to", but "I" is not an isolated subject. Let us take Xiangqi game into account, "In the world" is Da-sein immersing in game theory, Xiangqi's way, and Xiangqi opponents, constructing a comprehensive "presence" game.

In Xiangqi game, due to the magnification of the degree of freedom of the player's subjectivity, basic human virtues, such as fortitude, bravery, tenacity, patience, tricky, etc. are also magnified to more importance during playing.

Since Xiangqi is of so much richer humanistic spirit than Go, but most of the writings and ink marks left by ancient Chinese scholars and poets admiring Go rather than Xiangqi. Why ?

We know that, being the era of agricultural civilization during ancient times, printing, publishing, information, communication, transportation were far less developed than today. Game hand-to-hand talks used to occur in neighbouring only, thus usually two players involved. So we couldn't imagine that ancient people would organize a large-scale round-robin game. For this reason, the subjective humanistic spirit and the artistic charm within Xiangqi game is not revealed long before!

Focusing on game board with limited view, people find out the complexity of Go is obviously more than that of Xiangqi. Therefore, in ancient times, Go might as well followed the art guidelines of literati and nobles. It won the favor of Literati and poet, left much more words of elegance and tranquility to us. However, if contemporary people ponder Go game for meditation, they may find that such various "beauties" of Go bestowed by ancient literati sound so graceful, but just like girl's beautiful dresses,

are not so much relate with the characteristics of Go itself, in essence only be regarded as Dependent Beauty, rather than Free Beauty (Kant's Aesthetics).

Surely, Xiangqi is much more popular among the middle and lower classes, thus forming a common distinction to the Elegance of Go by contrast. Like the rivals between two Chinese traditional elements Yin and Yang, the competition between tow games on complexity and genre and style has been a very long history. Although there is no lack of rivalry between them now, but it is also regarded as mutual dislocation supplement and complementary, and none of them plays a dominate role at all. However, this clear distinguishment between "elegant" and "vulgar"  should be highly questioned in today's era of highly developed AI technology.

## 2.2      The complexity of Xiangqi is a system theory concept.

A professional Xiangqi players must examine the game for playing, by comprehensively evaluating the position, thus form a awareness of the overall situation, which is a systematic project. Xiangqi game is indeed very complicated, and players have to make decisions after reviewing the game: choose an offensive winning or a defensive draw strategy? Or a balanced choice mix the two? Being mostly related to the desire of inter-subjectivity, a player requires a dynamic analysis of the pluralistic structure of science through using system theory.

Complexity becomes a prominent science nowadays. There is no generally accepted definition to complexity, but experts have gotten more knowledge and understanding about it: complexity is closely related to the nonlinear, self-organization, dynamic process, Structural mutations, evolutionary processes, forms of infinite diversity, unpredictability (uncertainty)—these traits classified as symmetry breaking, making it difficult for humans to simulation. Facing such complexity of Xiangqi of player's inter-subjectivity strategy, AI even find it difficult to play.

The Santa Fe School, the most famous contemporary study of complexity, believes that the focus of complexity science research is not on an object or an environment, but on subject itself—the subject's complex adaptability and the corresponding complex structure. The actual existence in the world can be divided into two categories: non-living and living being, both of which have complex meanings of existing objects and structural forms. Generally speaking, the latter presents a greater variety, deeper, and higher complexity than the former, because more related to the above-mentioned subjectivity nature. Among the living beings, human beings are the most noble, graceful and beautiful beings, and have climbed onto the highest position of the evolutionary ladder, of the most complexity. When it comes to the complexity of structure and function, mainly reflected in the human brain, making it a subjective function of human beings.

Shallow-minded people usually think that comparing two persons of a tall and a short, the former is more complicated than the latter, because the cognition of the former needs to understand a larger amount of organic material consuming more food——i.e. despise the complexity of brain function thus exclude subjectivity. Perhaps, a person with well-developed limbs has its dexterity and motor skills. But considering Pascel's "man is a thinking reed", what level of complexity should be the

human limbs and body? Is it related to the complexity of his body and limbs when a professional Xiangqi player wants to show his Xiangqi techniques on the spot?

Similarly, borrowing the conclusions of computer science or out of intuition to the board, people generally conclude that Go is far more of complexity than Xiangqi. For example, by using the two indicators of state-space complexity and game tree size, Go is: $10^{170}$, $10^{360}$ and Xiangqi is: $10^{40}$, $10^{150}$[6], respectively. The gap between the two kinds of game is obvious and may be valid at the object level. People can say that Go on the game board is of more complexity than Xiangqi[7], but they ignore that Xiangqi is played by players of living beings with emotions, desires, impulsiveness, and mistakes in the sense of subjectivity (Especially playing under time pressure, byo-yomi). In the process of playing, the subjectivity, exactly inter-subjectivity, will present a high degree of complexity, which shows a much richer humanistic value in Xiangqi than Go. Borrowing the game theory, laymen have ignored the deep strategic complexity in Xiangqi, but the participation of this item can only be fully displayed in the round robin tournament system. So, the complexity of Xiangqi is the superposition of subject complexity and object complexity.

Furthering, there is a principle of hierarchy in systems science, which means that due to the differences in the various elements that make up the system, including the differences in the way of elements combination, the system organization shows a hierarchical order in terms of Status and role, structure and function, thus forms system levels being of quantities of difference. The level concept reflects the different system level of this qualitative difference or differences of higher levels in the system. The hierarchical con-structure of a system is like a layer after a layer of boxes enclosed.[8]

From the following content, we can see that the deterministic and non-deterministic layers of board games complexity are assigned to Go and Xiangqi respectively, which shows the difference of humanistic spirit with higher level significance.[9]

In computer science, there is a big difference between algorithmic complexity and computational complexity. In general, generating a solution to a problem takes much more time than verifying a given solution, and the former is often an NP problem of finding an algorithm, relying on the solver's inspiration. The high-level strategy in Xiangqi games is usually similar to finding the best move or most appropriate "equilibrium"of position, and usually it is a probability function. Adopted a round-robin game system, Xiangqi is of much higher than NP problem in the uncertainty factor, while the complexity of Go is considered deterministic exponential time[10]. Carrying out decision-making, human are the supreme beings, of the most complex, and non-linear self-organization. It is extremely difficult for computers to simulate human subjectivity into a "robots", and even if such "robots" exist, they are always of low-level mechanical rigidity. Computation by AI, however, is considered to perform pure object transactions, and its functions are brute force operations.

## 2.3    Multi-agent game

In order to fully reveal the complexity of the humanistic spirit of Xiangqi game, it is necessary for players to set a proper game system. If a Xiangqi is placed in a "mul-

ti-agent game", the high complexity of the game will open its way to her "realm of clarity"( M·Heidegger).

The so-called "multi-agent game", if discussed in terms of Xiangqi game, is a one-on-one game system involving multiple players, and multiple games are played against each other at the same time. The round-robin game is the most appropriate system for multi-agent game of Xiangqi, so that every player have a chance to be paired with all other players. While playing with others, every player must has his/her own preferences, profits, expectation, etc. involved. Therefore, the game system enters the intertwined state to all players, thus players rise their strategic level. The later stage of the round-robin game, the more complicated a strategic will be.

It is difficult for a Xiangqi player to be invincible all over his circle. Generally speaking, one player can always find such a situation where he meets his opponents with the same level，i.e. peer confrontation just like "diamond cut diamond". In other words, the Xiangqi game is always highly competitive at every level. There are two superstars in today's Xiangqi circle: Tianyi Wang and Weitong Zheng, ratings No.1 and No.2 respectively, although much higher than any other Xiangqi players in level, but their scores are relatively quite close, so that they always constitute competitors with each other. As for the level of other Xiangqi players there must be some players whose scores are quite close to each other at every possible level. Under such a circumstance, surely the competition to game is of more complexity of entanglement, far beyond every two-agent players.

Because games of competition are held often among same level and similar scores, professional Xiangqi players tends to get their same points or merely 1 point gap, by the end of the round-robin tournament. Therefore, during game all players hope that their respective strong competitors would be conquered by other opponents.

Another common scenario occurs, especially in Swiss system, at the end of a tournament, players'  ranking is according to their cumulative scores. There are quite often several ties created among players and their final rankings with the same score will be determined by the sum of his opponents' scores, i.e. small points. At such a circumstance, how many small points a player should get is not determined by the player himself, as a popular saying in Xiangqi circle goes: "Ranking is upon looking at other players' faces", that means to be determined by the competition among other players, quite often, the final result of a player's small points by calculation will not fully come out until the end of the tournament. It is such a situation that becomes the involvement and restriction of the interaction among Xiangqi players.

At the end of the 19th century, French mathematician Henri Poincaré realized that the laws of the "three-body problem" in the universe are extremely complicated, far more complicated than the "two-body problem". For example, taking the three bodies of "sun, moon, and earth" as an example, the orbits of their interactions cannot be deterministically and precised indicated. If we analyze the "N-body" movement, its complexity would rise exponentially.

Similarly, on entering the "multi-agent game" status, Xiangqi will present very complicated scenarios to players: "non-zero-sum game", "cooperative game", and exclusion of "equilibrium point", etc., which are reflected in advanced strategy as "non-deterministic solutions", such as checks and balances and incentives of compre-

hensive humanistic qualities in the process of interaction. Here, there is not only a contest of IQ, but also a contest of EQ, that is, the psychological factors for Xiangqi players to apply. Today it is still difficult for AI to understand the value system of ternary interaction.

Following are some examples:

In 1960 Chinese Xiangqi Individual Championship, the competition was very fierce. In the end of game, all three players Ronghua Hu, Shunan He and Guanlin Yang ranked first with same 14 points. Only by their small points can the above-mentioned players be determined as first, second and third rankings respectively.

In 1962 Chinese Xiangqi Individual Championship, In the end, Ronghua Hu and Guanlin Yang shared 22 points and tied for the championship, as small points were not counted.

In 1978 Chinese Xiangqi Individual Championship, Ronghua Hu and Guanlin Yang finally scored same 22 points, under such a circumstance the champion and the second were determined by small points.

In 1984 Chinese Xiangqi Individual Championship, Champion Laiqun Li and runner-up Ronghua Hu got the same score of 19 and were determined by small points, while the third to sixth places are tied with 18 points and were also determined by small points.

In the last round of the Chinese Xiangqi Individual Championship in 1988, Qin Lü, got the black moves behind Laiqun Li's red, made several questionable moves during the opening stage, resulting in very bad position and fully suppressed by Laiqun Li. At the middle stage Lü's situation was on the verge of collapse. However, an unbelievable scene appeared on the spot, Laiqun Li, who was well known for his precise moves and exquisite style, and was at his strongest at the time, made his many mistakes under HIS superior situation , as if deliberately had given a way to his opponent. In the end, the game was overthrown. As a result, Qin Lü won the game and tied with Ronghua Hu with 11 points, and Lü won the championship with the advantage of small points! Due to the loss of this game, Laiqun Li's ranking dropped a lot.

It has nothing to do with Go, subjective games always occur in Xiangqi events, especially in the later stage of the round robin tournament. The subjective game can be transformed into a strategic game, or a multi-agent game. The decision-making of the subjective game is to prioritize value evaluation over situational calculation. "When thinking about a move, I don't immediately analyze the innumerable counter-moves. First I analyze all the factors, pieces of the chess in order to determine the appropriate strategy and determine intermediate goals. Only when I know which move is the most beneficial to me, start I to calculate the corresponding moves. This process is basically based on experience and intuition, but it is inseparable from careful calculation after all." Therefore, "decision-making determines the genre of chess"[11]

However, being no subjectivity, AI has difficult to carry fully out value simulation. What can it do calculations for lower class values is by using approximate simulation, that is, for low-order non-linear things, but only to a limited extent. Regrettably, the Xiangqi round robin tournament system is relatively rare used in today's era as it is not favored. It is said that players are easy for cheating while game playing.

## 2.4    Nonlinear factors of Xiangqi games

The so-called "linear", simply saying, refers to the proportional and linear relationship between quantities, which represents regular and smooth motion in space and time, also vice versa. Any linear relationship can be transformed into a symmetrical relationship through mathematical conversion, while the nature of nonlinearity is asymmetrical.

Xiangqi has far more asymmetric forms than Go. In addition to the above game results, it also exists in:

①**Non-linearity of weight coefficient of player's points.**

In mathematics, in order to show the importance of certain quantities in the total amount, different proportional coefficients are given to these quantities, which is called "weighting". The weighted assignment coefficient is the weight coefficient.

The general score regulation of Xiangqi competition rules is that the winning side gets 2 points, the losing side gets 0 points, and each draw gets 1 point. For the score of a Xiangqi player: winning a game is equivalent to a draw of two games, but is the actual utility equivalent?

Were actual utility not considered, there would be no weight coefficient, and the points obtained by player is simply the direct utility. For example, there are two Xiangqi players, A and B, both are very equivalent in chess skills level. If one of them adopts an offensive strategy and the situation follow the one's wish as entering a fierce sharp confrontation where each has his own scruples and vulnerabilities, both sides are prone to make mistakes and the probability between them are equal, under such a circumstance they are more likely to win or loss, either this or that but less draw. If a Xiangqi game that must be decided, the mathematical expectation of each side's possible score is the same and then each one has his utility value: $Ea=Eb=0.5\times2=1$; On the other hand, if the situation is balanced and stable, it is easy for both sides to has a good command of without a big error, so the result is more likely to be a tie. A tie game has the same mathematical expectation value for each side: $Ea=Eb=1$. Therefore, no matter whether the chess players of both sides adopt a confrontational strategy or a prudent defence strategy, they all have the same value and significance, and there is not much practical value and significance for the decision-making of eager for "points".

However, in Xiangqi game of round-robing tournament where masters gathering, especially in the latter stage, there must be many players with equivalent levels, thus often result in many draws when they paired. If the above-mentioned chess players A and B have the respective scores of A of big and B of small before they paired, then this round will lead to a draw, relatively, B is more beneficial to the increase of his small points, and A is bad vice versa. From this point of view, the utility of 1 point for a draw is bigger for B and smaller for A ——this is a non-linear factor.

Therefore, the scores obtained by the Xiangqi players are mostly inconsistent with the value (weight) of the benefits that the Xiangqi players can obtain, that is, the actual utility of win, draw, and loss is not simply in 2:1:0 linear ratio. The theory of dissipative structure believes that following linear rules is a matter of a conservative system. The brilliance of round-robin tournament game is that the relationship between the final score of the players and the final ranking presents nonlinear complexity. Because of an

open system. This tournament game provides a beneficial place for Xiangqi players to perform "mentality" contests, making Xianqgi such a good skill leading to a higher level of development, and evolution occurs from it. Therefore, an excellent Xiangqi player should evaluate the scoring weight of the game, whether it is about to face or the game that is already in progress. In addition, other factors must be combined to make a corresponding comprehensive decision: win ? or draw? or a reconciliation of the two with some bias?

## ② Relying on the development of flying knives in the Beginning stage.

In today's professional Xiangqi tournament, players generally attach great importance to the development of flying knives in the opening stage.

If various types of layouts of beginning establishment of Xiangqi are quite common and regular, it must be regarded as the routines that players are familiar with, as such establishment of layouts is "symmetry" in essence both in the space and time axis, on which limited numbers of moves presented. If the above method is invariant, then a flying knife of layout is specially designed to "break" this symmetrical distribution, that is, to deliberately establish some variants in the initial moves of the beginning stage, and such variants are often specific matching, that means, it is formulated according to the personality defects of enemy's player in certain fields. The general purpose is to let the enemy lead to an unfamiliar position so that the enemy must cost much more thinking time and then give him a considerable psychological blow. Technically speaking, flying knives is often related to a trap setting so as to let the enemy fall into it. Usually flying knives developed in this way can often be seen surprise and unpreparedness, which make the enemy tired of dealing with it, so as to achieve miraculous effects.

Here It can be seen that Xiangqi game gives players greater sustenance for creativity.

## ③Non-linearity between offense and defense in Xiangqi 's position.

In a game of Xiangqi, when a player tries to makes a move, if he or she moves one piece at a key point both for the sake of attack and defense. Surely this must be ideal move of very high efficiency, but often hard to succeed. Because, what the situation, or the position, can provide the players with practical actions, more common is that it should be either focused on offense  otherwise defense, ie. both are difficult to be equally taken care of. This needs to be weighed by adding multiple parameters according to the actual situation, often supplemented by probability estimation. Usually, focusing on strategic offense is a winning strategy, while focusing on strategic defense is a draw strategy.

Excellent Xiangqi players are often able to formulate an appropriate strategy based on the actual situation, keep up with the needs of the situation in a timely manner, adapt to changing circumstances, and can also destroy the enemy's strategy. Grand masters Ronghua Hu and Tianyi Wang，are good examples in this regard. Their excellent ability can also be summed up as: break the usual, the essence is the symmetry breaking.

There is a common saying in military affairs: "The best defense is a good offense." This understanding is obviously one-sided, rigid, and mechanical, because it only magnifies and expands the truth of a certain side, a certain angle, and a certain part infinitely stretched to a comprehensive, complete, and holistic truth. Here it should be noted that Xiangqi game is a system of open complex nonlinear. Here, the dialectical relationship between offense and defense does not simply appear as two linearly related constraints. Even so, it is not necessarily a proportional relationship, or there is also a possibility of a negative correlation. In Xiangqi game, if a player disregards whether the conditions are mature or not, and regardless of the consequences of failure, rushing forward and attacking recklessly, the effect would be out of his will and counterproductive.

Similarly, defense is not necessarily the best offense. In some situations of Xiangqi game, if the defense is too negative, shrinking, and defending everywhere, then firstly, the good opportunity to counterattack will be lost; Secondly the enemy has no worries to ward off attack. However, the more common situation is that when one side plays want a draw with purpose, his opposite has difficulty in winning the game so that has to follow the fate.

How to achieve the most beneficial combination between offense and defense is usually complex, which is rooted in the existence of a large number of nonlinear factors in Xiangqi. Therefore, the importance of strategic decision-making is highlighted. In a Xiangqi duel, whoever kills the enemy king first is the winner. Therefore, when considering the confrontation, duel, and transition between offense and defense in the position, what needs to be evaluated is to compare the speed of the current duel between the two sides. Using killing king speed, a player can measure and set the appropriate ratios for the non-linear relationship between offense and defense.

Since Xianqgi game is played by two players, the evolution of the situation is often not determined by one side unilaterally. Therefore, when planning a strategic plan, one Xiangqi player must consider various personal factors and even psychological factors of both sides into account. The paradox of Xiangqi is that in high-level professional tournament, the role of psychological factors is often magnified during playing. At this time, when Xiangqi players want to attack his enemy violently, sometimes they will play abnormally and astray due to psychological disorders and excessive nervousness, thus resulting in offensive mistake and futility. Similarly, when a player simply wants to stabilize the situation seeking a draw, he will also play abnormal and astray due to psychological disorders and excessive nervousness, thus resulting in defensive mistake and futility.

④ **The non-linearity of the value of Xiangqi pieces.**

Excellent Xiangqi players should be familiar with the effective value evaluation of various Xianqgi pieces, so that they can compare the overall strength of the pieces in the situation during playing, and then use this as a basis to evaluate the situation, so that they can better control the position and situation.

However, the value of each piece is often dynamic, changing, related to the overall situation, the specific position, the specific combination of pieces of one's own side. For example, a combination of one horse and one cannon is generally stronger than two

horses' or two cannons' together in the middle or end game, though their nude valuation is almost equal. Moreover, the advantage of one side's pieces is often compared to the weakness of the opponent' s. For example, lack of one advisor (guard) will be afraid of combined attack by chariot (rook), horse (knight), and soldier (pawn); Still: lack of elephant (bishop) be afraid of joint attack by chariot and Cannon (catapult); Still: full guard (having all elephants and advisors) can resist the attack of one chariot, etc.

In this way, various dynamic variations of values are nonlinear transformations of Xiangqi piece values, and constitute the symmetry breaking of the constant value of Xiangqi pieces in essence. An excellent Xiangqi player can do a better job of: a more in-depth comparison between the evaluation   of the offensive and defensive relationship of the position and the evaluation of the comparison between two sides' pieces (static). Good at this in-depth comparison, it is often possible for a master to do sacrifice for attacking, or being able to carefully guard against the enemy's sacrifice for attacking, thus can often be miraculously effective.

The evaluation of Xiangqi pieces also permeates the player's personality preference. So, The evaluation of Xiangqi pieces is basically recognized as a sublimated art in the field of humanities.

## 2.5    The game of Xiangqi is about mental confrontation

Unlike Go game, Xiangqi requires not only careful calculation, but also a great investment of mental state, that is, to fight for emotional intelligence and to compete with psychological posture. Xiangqi game requires mentality for players to deal with mental confrontation.

When the Xiangqi game enters the later stage of the round-robin tournament, the psychological activities of the players are particularly important, as the strategic decision-making arose, either win or draw, often swings between the two to deal with the rapidly changing situation. In this regard, how players try to be strong, powerful, or how to seek safety, must reflect their changes psychologically, thus, the symmetry of spiritual things will be broken, and opening the realm of spiritual clarity (Heidegger).

In order to enter a good game state, a Xiangqi player need to pay attention to their opponent's demeanor in addition to making psychological adjustments to themselves. Anatoly Karpov, the former world chess champion from Soviet Union, has accumulated so much experience in psychological warfare throughout his life. He said in his : "When facing a flesh-and-blood opponent, you should try to familiarize yourself with his approach, because this and only this , you can analyze it in depth." "(When the game is at its climax) In this tense moment where various situations will arise, be extremely careful about those words that (the opponent) unconsciously, or even not speaking. Signals that flash in the mind, often revealing signs of optimism, satisfaction, doubt, or fatigue, are enough information for a sophisticated adversary to seize and exploit."

In the chess circle of former Soviet Union, grand-master players usually paid special attention to psychological warfare in their games. For example, Karpov and others hired psychologists to advise themselves, moreover studied the psychologists hired by their opponents. So the expansion of chess game goes divergently beyond the board.

So you have to take the mental aspect into account when you build your overall

strategy and then implement it as a competitive plan. You also have to take that into account to different degrees from game to game. I would say In fact, psychology should be distinguished from strategy and tactics. The first comes from a certain defensive strategy, which helps you draw the overall scope of action; the second comes from a certain combination strategy, which helps you continue to implement your strategy. Especially keeping a hand for you.

"In order to incorporate all these psychological aspects into the various stages of a game, it is necessary not only to know the opponent's "mental profile", but also to determine the psychological profile of the people who assist the opponent; After learning what advice its 'boss' can make, you can better deploy the details of the battle you're fighting. " said Karpov.

Xiangqi grandmaster Xinxin Zhao wrote in his blog "Life imitates Xiangqi, Thinking of Choice": "While two Xiangqi players face to face confronting, every move from both sides may become an important factor affecting the outcome of the game. Through eye contact, body language, words utter from mouth, facial expressions, a player may grasp the opponent's psychological fluctuations to guess his/her planing and strategy. Surely Xiangqi strength is the key factor, but other small movements can sometimes give each player a little hint."

Qiang Zhang, a Xiangqi player of the Beijing Weikai Team, said: "When you play Xiangqi with human beings, you can see the psychological changes of the opponent's eyes of the moment. If play with a computer, you will find it is always cold, without any emotion...... But at this time, I am prone to psychological fluctuations, which have a certain impact on the my move."[12]

Because Xiangqi players often experience psychological fluctuations during the game, they will decline their skills and thus result in mistakes. Therefore, the advanced strategy is to encourage his enemy to make more mistakes while trying to avoid his own side fewer mistakes. For this reason, a real excellent Xiangqi player will often play in such a way as if he made mistakes, through cheating, sacrificing for attack, casting bait, feint in combat，and so on. Regarding Xiangqi game as a "battle of the soul",  there are many famous practical examples:

In 1972 The World Chess Championship held in Reykjavik, Iceland. The challenger Bobby Fischer of the United States defeated the defending champion Boris Spassky of the Soviet Union. Fischer won the match 12½–8½. During the game ,Fischer provided much his provocation towards Spassky only to let him loses temper and finally to meet Fischer's satisfaction.

In 1939, in Hong Kong Wenyuan Dongand Deyu Zhou were paired for supremacy of Xiangqi, during the game Wenyuan Dong also used much "provocation way", and Dong won six consecutive victories.

In 1980 Chinese National Xiangqi Championship Individual held in Leshan Sichuan, Ronghua Hu, renown as "Ten consecutive champions"at that time, took part in this event but suffered a disastrous defeat. In the first round, by lottery, Hu played red paired with Guanlin Yang, deployed his skillful Flying Elephant Opening. Before the game, Hu was much confidence to win the game so had a win strategy. When the game went to its end-stage, Hu has got a great advantage in such position as Hu had already caught Guanlin Yang's cannon on the corner of the board. Surprisingly enough, unin-

tentionally Hu touched a soldier that he didn't wish to move, but Hu had to move his soldier by rule. As a result, Yang' s cannon was revive and flee, which led to Hu lost this game eventually. From that on Hu got his emotional knot of remorse and embedded deep in his soul through out the Championship game. In this way, he lost his normal state, played game abnormal, making mistakes again and again, and fall into relegation finally. After the Championship, Hu reflected on himself deeply: what makes Hu's lesson most is that Hu was lack of failure experience and its related mentality adaption.[13]

In 1956, before the final round of the Chinese National Xiangqi Individual Championship，Jialiang Wang had already gained points advantage, leading Guanlin Yang in 2 points. In the final round against Shun'an He, he could win the championship as long as he played a draw, but he lost at the last moment. Finally, Guanlin Yang became the champion.

Before the last two rounds of the Chinese National Xiangqi Individual Championship in 1978, Guanlin Yang already had an advantage of 3 points over other players. As if the champion were close enough at hand, what Yang needed to do for it is only get 2 points in the last two rounds, but he did not seize the opportunity actually，he got 1 point only . Instead Ronghua Hu became the champion.

Before the final round of the Chinese National Xiangqi Team Championship in 1979, the Guangdong team was already ahead of Shanghai's with 1 point. In the final round against Shanghai, Guangdong would reach the champion as long as get a draw. When the game is on, the second, third, and fourth tables had all soon been ties, the first table would have allowed the Guangdong team to win the champion if it would not lost the game, but they lost indeed at the last critical moment. Guanlin Yang, sitting at first table against Ronghua Hu, played game into end stage,   with one horse three soldiers plus double advisors fight against Hu 's one horse and two soldiers plus full guard. Originally, Yang's pieces and positions was invincible enough to   ward off Hu' attack. However, under a prestige name of "Uncle Majic" and No.1 master for endgame, Yang Seems unwilling to waste his good reputation and to be a little bit more aggressive to win. Meanwhile, Hu also urgently needs Yang' s greedy. Sharing such a commen idea of combat, taking advantage of the opportunity of giving up full defense, Hu and the Shanghai Team achieved their goal. This is the real charm of the low-level "co-operation" in Xiangqi games!

As grandmaster Jialiang Wang once said, it is obviously much easier for players of peers to get a draw rather than a win. However, due to large amount of non-linear factors in games, especially the role of mentality, players often go abnormal or astray.

Before the last two rounds of the National Chess Individual Competition in 1979, Guangming Fu had already gained points advantage, leading Ronghua Hu by 1 point. In the last second round, Fu could basically win the championship as long as he played a draw against Hu. but at this moment, Hu launched a psychological warfare through showing his great sadness and hesitant to move. Sawing this situation, Fu gave up his full defense strategy, transferred it to combat with Hu, thus let Hu Ronghua became the champion.

Before the final round of the 1981 Chinese National Xiangqi Individual Championship, Laiqun Li had gained advantage, leading Dahua Liu by 2 points. In the final

round, Li Laiqun could win the championship as long as he played a draw against Dahua Liu, but he lost at the last moment. Instead, Liu Dahua became the champion.

Before the last round of the second Wu-Yang Cup Xiangqi Championship Invitational Tournament in 1982, Dahua Liu had gained advantage, leading Ronghua Hu by 2 points. At the final round, Liu,   played against Hu, would get the champion if force a tie with Hu, but failed eventually!

Before the final round of the Chinese National Xiangqi Individual Championship in 1987, Laiqun Li gained advantage, leading other chess players by at least 2 points. Were he not lose in final round game, Li calculated that he could be the champion. But the reality occurred not in this way, in the final round, Laiqun Li was defeated by Zhengwei Wu. At the moment of his lost, Li said to Wu: "Your win result in I am the loser of champion!". Shortly afterwards, a news came: other strong contenders for the champion were lost too in the final round, so that the champion belonged to Laiqun Li.

Before the final round of the 1998 Chinese National Xiangqi Individual Championship, Wenqing Yan had gained advantage, leading Yinchuan Xu by 2 points. In the final round, Wenqing Yan could win the champion as long as he played a draw, but failed at the last critical moment. Instead, Yinchuan Xu won the champion.

Before the final round of the 2005 National Xiangqi Individual Competition, Yang Wang had gained 2 points advantage over Zhi Hong. In the final round, Yang Wang could win the champion as long as he played a draw, but failed at the last critical moment. Instead, Zhi Hong won the champion.

## 2.6    Xiangqi pieces are rich in humanity and artistry

Each player begins the Xiangqi game with sixteen pieces, among them seven types of pieces included, each type has its own personality of advantages and disadvantages. Through various permutations and combinations, pieces are materials that make up a variety of more complex functions, such as "lack of elephants is fear of cannon attack", "lack of advisors is fear of chariots, soldiers and horses attack", "two-elephants linkage become stronger", "river-crossed soldiers hand in hand become stronger" and so on. The functions of various Xiangqi pieces are also closely related to their different positions, such as "Soldier entering palace threaten enemy' s King", "deploy a cannon behind a horse" and so on. Like this way, Xiangqi game provides players with its specialization and diversity of pieces nature, thus players can fully demonstrate their individual characters.

About one hundred years ago, there was a famous Xiangqi player Zhen Zhong in eastern Guangdong. He specialized in a famous composed Xiangqi game "The Gathering of Seven Stars", and get to comprehended its mysteries and true meanings. From that he becomes very good at endgame, especially at engagement playing chariot plus soldiers against chariot plus soldiers.

Zhen Zhong's playing style has deeply influenced Guanlin Yang, the next generation of national Xiangqi players in eastern Guangdong. Guanlin Yang, also like his predecessor, was good at playing endgames, especially playing chariot plus soldiers against chariot plus soldiers.

Guanlin Yang's playing style has influenced Yinchuan Xu, well known as "Celestial

Being of Xu", the national player of the next third or fourth generations. The typical combat style of Xu is to control and stabilize the situation, then make it smoothly transition to an advantageous endgame. Xu prefer to and good at playing an endgame left by horses and cannons.

Ronghua Hu, a grand master of his generation, was at the power peak of his Xiangqi career, also liked to play endgame without chariot. Hu's endgame style does not pay so much attention on soldiers, but wins by taking advantage of the momentum.

Liguo Meng, a deceased famous Xiangqi player from Shenyang, known as an "expert in killing elephants". He could often launch effective attack by killing enemy' elephants.

Two deceased famous Xiangqi player Yiting Li from Wuhan and Qiyou Wan from Nanjing were both famous for their using piece of horse well.

A deceased Singapore Xiangqi player Chunyu Lan was good at using cannons and thus got the reputation as the "King of Cannons".

In the 20th century, Xiangqi players from Northeast region were strong-tempered and liked to fight boldly, which was clearly reflected in their opening style. Whenever hold a black for opening, they inevitably deployed a Mirror Cannon Defense to deal with the Central Cannon, or some times choose an opposite direction cannons in the halfway, hoping to have a sharp confrontation where diamond cut diamond, eye for an eye, a tooth for a tooth.

Having absorbed much nourishment from western chess theory from the USSR, Xiangqi grand-master Tianli Xu and Ronghua Hu from Shanghai have achieved many good results in practical combat from applying Flying Elephant Opening. Rejuvenated from ancient form, this Xiangqi opening system practice must have a well understanding of the overall coordination of pieces, occupying key points, controlling important lanes, stretching and expansion own side space, moving pieces for momentum, applying Tai-Chi-Kung-Fu of making little effort but for great results, step-by-step transformation of position of pieces for a new adaption, which upon opponent's pieces, frequent transferring strategies between winning and draw, etc. To have a good command of Flying Elephant Opening, one should have a long-term view and overall planning. The reason why Tianli Xu and Ronghua Hu applied so frequently deployment of this opening to meet their enough satisfaction were that they make full use of their superior mid-game and end-game skills and techniques. Moreover, the Xiangqi circle in Shanghai was of higher level so that professional players were able to broaden their views to incubate and develop some new opening of Xiangqi game. Besides, thanks to the background of westernized Shanghai style culture, under which people absorb foreign advanced technique quickly.

Undoubtedly, the game of Go can also be individualized by professional players. With no individuality of Go pieces, if a Go player wants to play Go pieces to show his own individuality, he must play many hands before he construct some "grounds" and some "situations". Expressed by the Go pieces in the game, a Go player can form such functional elements like: shape, clamp, liberty, eye, urgent place, big point, influence, territory, ikken-tobi (one-space jump) , etc., therefore gradually build and reveal his individual style. From a methodological point of view, this process is an indirect presentation.

Originally Go was used as a tool for astronomical and astrological simulations. The pieces of Go are simply used as "star" materials to construct the game system, and the established materials are so pure and single-minded characters that the rules, pieces, and boards all follow a high degree of abstraction, simplicity, and symmetry. That means the operation of "the way of heaven is simplification", but its inner nature wants to build a very high towering game tree! Its transformation is projected on the 361 points of the board, and the program must obtain: 1) Calculate the vast and complicated elements of the above-mentioned Go functions and the relationship between them, that is, the game of Go is a "quantity" hand-talking competition; 2) Intuite Go shape and obtain the feeling of position of pieces, that is for the judgment of the shape of pieces in aesthetic view, such as "flavorful", "good taste", "vivid charm" and so on. The aesthetics of graphics and the efficiency of playing are the dialectical relationship between mutual cause and effect, mutual purpose and means, mutual form and material, especially in the opening stage. Aesthetically, the aesthetic form of classicism is in accordance with the "golden section" rule, forming isomorphic elements together with efficiency and briskness, which are reflected in Go.

Xiangqi and Chess are both board games that imitate human warfare, so that the two game's form and content directly address the theme of humanistic spirit; while Go was established for the need of calculate astronomical astrology, in some what, the game is used for the demonstration of Chinese ideology Taoism. Therefore, Go is not because of its apparent "simpleness" can easily achieve its "purposeless purposiveness".(Immanuel Kant: Kritik der Urtheilskraft)

Although Picasso stated: "Simple beauty is not meant superficial and simple." Go game seems not to be "simple beauty", but Go really takes astrology as its ultimate goal. Here let's look at Kant's conclusion: "man is the final purpose of creation" , which can be considered by us. Taking about ancient Greek art as an example, it follows the general and principal characteristic of "noble simplicity and quiet grandeur" , in order to show greatness and nobility only when the soul is in a state of harmony and tranquility, pointing to the high-end humanistic value, so it is very popular in the West sought after by the aesthetic circle.

Being of richer aesthetic practice than that of Xiangqi, but Go game simply pursues the beauty of form, thus excluding the diversity and richness of material. In this way, the comparison between Go and Xiangqi in comprehensive humanistic spirit, Just like the comparison between ink painting and seven colors painting!

## 2.7    The boundaries of artificial intelligence to express humanistic meaning

What a work of AI, i.e. computer software, is to estimate many various values on game board through evaluation functions, then decompose them one by one, restore them to a calculable approximate linear relationship, finally perform calculations. Simulating human brain, value analysis of the game situation by AI must be an objective matters. Being no subjectivity, AI is unable to analyze the inter-subjectivity of Xiangqi players' strategies. Although AI nowadays is powerful enough to play effectively based upon the opponent's various moves, but essentially is still somewhat a "self-adaption" program.

When the enlightenment came, European broke the shackles of Christian theology and promote the spirit of humanism by prevailing with much reductionism and mechanical materialism. European ideologists believes that everything in the world are "machines", including living beings, even humans too. Machine operate according to its deterministic path only. In that era there were no comprehensive concepts such as self-organization, openness, and system theory, and so on. Although the age of Enlightenment has long passed, whereas there is still a market for anti-subjectivity such as mechanical materialism, instrumental rationality, and strong reductionism in China today.

All kinds of computers today are essentially machines, and any artificial intelligence is just operable software. However, human beings are not machines but advanced beings with spirituality. Today, many AI experts relish to talk about the fact that in May 1997 New York City, USA, IBM's "Deep Blue" played six games against Kasparov, the world's top chess player, and finally won 3.5:2.5. But AI experts ignore an important detail: During the whole 6 games process, whenever each game finished, Benjamin, a chess master belonging to IBM, made program corrections for "Deep Blue", that is, tried to modify specific parameters according to Kasparov's personality of chess play. As far as this detailed fact is concerned, we do no conclusion that the victory of "Deep Blue" is 100% purely due to the AI!

The game principles of chess AI are based on several basic theories: Zemelo's theorem of "existence of the best move", von Neumann's "maximum and minimum value theorem", McCarthy's "α-β pruning method", etc. and more basic knowledge: "rational man assumption".

However, real people must enjoy their free will, which is a free synthesis of rationality and irrationality. Besides, rationality has limitations, which are supported by Gödel's two "incompleteness theorems" and David Hume's deep insight into "reason is the slave of passion". Not to mention the limitations of irrationality.

Hume further pointed out: "There is always a gap between facts and values." Later, G.E. Moore made a more refined dichotomy between facts and values, which advances human language analysis (thinking) to a higher level. My understanding is that: fact is a scalar and value is a vector,   and the dimensions of the two are different, so that they cannot be confused or equated with each other, otherwise the Nature's law of indestructibility of matter will be invalid. AI is of objectivity so that limited to deal with objective things. Although AI can try its best to simulate and deconstruct the value of things, and then "calculate", but there is still a limitation. Being no subjectivity, computers are quite incapable of understanding ternary and more diverse value systems.

The true humanistic spirit must be expressed by the human subject. A truly noble and superior humanistic spirit must surpass the rationality and irrationality of any mediocre people, and embark on a way to nobility, which is reflected in Xiangqi game, i.e. to achieve a profound realm. For example, Yinchuan Xu is recognized as profound in technique and reach spiritual realm and so get much appreciated as "Immortal Xu ".

Therefore, whether it is rational or irrational, it is all due to limitations that make people attach limitations. Reflected in Xiangqi game, players often make mistakes and play abnormal, especially under time pressure players often engage in Xiangqi by a sense of intuition, showing strong irrational emotions. Of course, computer make

mistakes also during playing but without any emotion.

Experienced Xiangqi players deeply understand: while trying to avoid their own mistakes and abnormal, they also need to take a strategy for attacking by irrational orientation, and induce opponents to make mistakes and abnormal——this kind of confrontation game has entered a "subjective game".

For example, sometimes master players use the negative passive defense trategy pretending to showing his weakness to lure his opponent to invest much power in attack，thus result in opponent's weakness exposed instead. This kind of profound strategy means a creation for the conditions of opportunity to win.

A real master players should take advantage of enemy's loopholes. In essence, they pretend to show own "strategy of draw" to promote the opponent transfer his   strategy from draw into win. from this point pf view , people may discover that how the charm of Xiangqi exist!

For example, when Ronghua Hu faced a stable and balanced situation and his opponent tried to force a draw, he would often make a feint to make the opponent feel that "there would be a chance for him to win the game". Being tempted and taking an inch forward to attack by the opponent, this happened to give Ronghua Hu a chance to win the game.

Another example, in the 1982 Shanghai Cup Xiangqi Masters Invitational Tournament, Laiqun Li played with red and deployed an elephant opening vs.  Ronghua Hu. To against Li, Hu deployed a Golden Hook Cannon, but surprisingly enough soon rearranged it to be a Palcorner Cannon at opening stage. This kind of repeated movement for one piece is obviously violates Xiangqi theory, but Hu still got his satisfaction in the following steps. Why? Because Hu's move is specially formulated at Li's characteristics: suspicious, delicate, and time-consuming.

Another example is that Qin Lü often plays "deception technique" in Xiangqi game to lure his opponent to see the appearance of the position only and to be deceived through his tricky, thus could get his satisfactory results from it.

Further, facing the well-prepared opening routines by other players, Tianyi Wang often plays some "irrational moves" to deviate from the opponent's familiar position to strange one for both sides, so as to take full advantage of his powerful middle game technique.

Purely analyzing by AI, the above-mentioned moves must be all bad only to lose points. However, from a philosophical point of view, the reason why sophisticated players sometimes use "harm tactics" is precisely to show their own freedom of subjectivity. Max Scheler said that it be only human being who can spit out a powerful "NO" to his surrounding environment! However, AI could hardly adopt such a derogatory and loss-based plays. What does it could is only focus on the board situation and conduct "maximum and minimum value method" analysis.

# 3      Conclusion

The most complicated things in the world must be closely related to human subjectivity, which   is mainly manifested by the emergence of high-level systems. The emer-

gence is the breaking of symmetry of system. If you compare Xiangqi and Go carefully, you can find that there are many symmetry breaking in the complexity of Xiangqi, such as: the ending has a draw, The diversity of chess pieces, the horizontal and vertical asymmetry of the game-board, especially the nonlinear relationship between offense and defense strategy, all which Go game do not posses. Today people are obsessed mostly with the complexity of Go and its AI technique, but they don't realize that human' s subjectivity involved in Xianqgi game showing much humanistic complexity far beyond AI's reach.

The system theory indicates that emergence is a symmetry breaking, achieved by effects of openness, non-linearity, non-equilibrium and giant fluctuations. These characteristics seem to be compatible with Aristotle's "four causes" in the theory of entity construction, i.e. formal cause, material cause, efficient cause and final cause. Careful analysis of the Xiangqi reveals that, if an emergence occurs within a game system, the human subjectivity would be highlighted in the world of value. Only implementing a round-robin game system, would Xiangqi system occur emergence   and players fully their rich humanistic spirits.

Though AI develops rapidly, people are pay little attention to explore its limitation and boundaries. Though AIs are advanced enough to try their best to simulate and analyze human subjectivity, but in a superficial sense. Simply because AI is a machine, while humans are not machines. You might carry a thought experiment to see AI's limitation: If a round-robin game for Xiangqi is held, participating by top Xiangqi players and AIs altogether, then we guess who would be possible the championship and second place ? I tell you that there is little possible from AIs! Of no subjectivity, AI does not understand the "inter-subjectivity" strategy at all.

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