GNU Shogi (Japanese chess)

Mike Vanier

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This document describes GNU shogi, a program which plays Japanese chess (shogi) against a human opponent.

1 Introduction

GNU shogi is a program that plays shogi, the Japanese version of chess, against a human (or computer) opponent. This file describes how to use GNU shogi and also gives background information about the game of shogi.

This file describes GNU shogi version 1.3.2. It was written by me, Mike Vanier, the current maintainer of GNU shogi. My email address is `mvanier@cs.caltech.edu`.

GNU shogi is actually two programs:

'`gnushogi`'
: is the text-based program which also contains the game-playing engine.

'`xshogi`'
: is the X-windows graphical interface to gnushogi.

Since xshogi invokes gnushogi, most players will just type "xshogi" and start playing.

Disclaimer: I use the personal pronouns "him", "his" etc. to refer to a shogi player regardless of gender. That's easier than writing "his or her" all over the place. I don't mean to infer that women don't play shogi; in fact shogi is very popular in Japan among women as well as men.

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2 About the game of shogi

> "Japanese chess cedes nothing in depth or beauty to the European game... it is at least as interesting."
> — Alexander Alekhine
> (quoted in David Pritchard, *The Encyclopedia of Chess Variants*)

> "... shogi [is] by far the most complex form of chess that has ever achieved widespread popularity."
> — R. Wayne Schmittberger, *New Rules for Classic Games*

Shogi is the version of chess played in Japan. It is strikingly different from standard chess (which I shall refer to henceforth as "international chess") and also to all other regional variants, because captured pieces can re-enter play on the side of the capturer. This has several interesting effects on the play of the game:

1. Shogi is much more complex than international chess, at least in terms of the average number of possible moves per turn (estimated at about 35 for chess and at about 80 for shogi).
2. There are almost no draws (about 1-2% of all games in professional play).
3. Exchanges complicate the play rather than simplifying it.
4. There are no "endgames" in the standard chess sense; all pieces remain in play throughout the game. Games typically end in a race to checkmate the other player before being checkmated oneself.
5. Ownership of a piece is not indicated by the color of the piece; instead, pieces are wedge-shaped and point towards the opponent. The name of the piece is inscribed in Kanji characters on the front of the piece.
6. Most importantly: it's more fun than other forms of chess :-)

Shogi is extremely popular in Japan; it has been estimated that 20 million Japanese can play shogi, of which perhaps 1 million are active players. It is even more popular there than the game of go, Japan's other favorite board game. There are a number of professional players who make a considerable amount of money playing in shogi tournaments, and the game receives extensive newpaper and television coverage. Despite this, the game has yet to become popular outside of Japan. Part of this is because the Kanji characters on the pieces scare away some people, but mostly it's due, I think, to lack of exposure to the game and to the difficulty of finding opponents. I hope that GNU shogi will help introduce shogi to a wider audience.

2.1 The rules of shogi

Shogi is a two-person abstract strategy board game with full information (i.e. all pieces and moves are visible to both players at all times). It is in the chess family, being descended from the same ancestral game as international chess: the Indian game of Chaturanga. The two players are referred to as "Black" and "White", with Black moving first (unlike in international chess, where White moves first), and with movement alternating between the two players. Note that "Black" and "White" are just names; the pieces are not colored. Instead, they are flat, wedge-shaped pieces which point towards the opponent. The identity of a given piece is indicated by two Japanese Kanji characters on each piece. In fact, only the top character is needed to identify the piece and thus only the top character is used in shogi diagrams. I will use alphabetical equivalents in the diagrams here; to see what the Kanji characters look like, start up xshogi (see Chapter 4 [xshogi], page 33) and compare the starting setup there with the starting setup in this file (see Section 2.1.2 [The opening setup], page 15).

The object of the game is to capture the opponent's King. The board is a grid of 9x9 uncolored squares, and pieces are placed on the squares. Each player begins with 20 pieces, described in the next section. Capture is by displacement, as in international chess.

2.1.1 The moves of the pieces

Each player at the beginning of a shogi game has a total of 20 pieces of eight different types. The moves of the shogi pieces can be divided into three classes: "stepping" pieces, that only move one square at a time; "ranging" pieces that move any number of unobstructed squares in a line, and "jumping" pieces that can jump over obstructing pieces to reach their destination squares. Most pieces can also promote to different (usually stronger) pieces under certain circumstances (see the next section). All pieces capture the same way that they move (even pawns). The piece moves and promotions are as follows; each piece name is followed by the standard piece abbreviation:

1. The king (K). The king can move one square in any horizontal, vertical, or diagonal direction, just like the king in international chess. The king does not promote.
2. The rook (R). The rook can move any number of squares in a horizontal or vertical direction. The rook is the same as the rook in international chess (except that it can promote). A rook promotes to a "dragon king" or "dragon" for short (often just referred to as a "promoted rook"), which can move as a rook or can move one square in any diagonal direction.
3. The bishop (B). The bishop can move any number of squares in a diagonal direction. The bishop is the same as the bishop in international chess (except that it can promote). A bishop promotes to a "dragon horse" or "horse" for short (often just referred to as a "promoted bishop"), which can move as a bishop or can move one square in any horizontal or vertical direction. Note: the horse should not be confused with a knight (see below), as they are two completely different pieces.
4. The gold general (G). A gold general can move one square in any horizontal or vertical direction, or one square in a forward diagonal direction. Gold generals do not promote.
5. The silver general (S). A silver general can move one square in any diagonal direction, or one square straight forward. A silver general promotes to a gold general.
6. The knight (N). A knight can move one square straight forward followed by one square to either forward diagonal, jumping over intervening pieces if any. In other words, a knight moves like its international chess counterpart, but forward only. A knight promotes to a gold general. The knight is the only jumping piece, as in chess.
7. The lance (L). A lance can move any number of squares straight forward. A lance promotes to a gold general.

8. The pawn (P). A pawn can move one square straight forward. The pawn captures the same way that it moves, in contrast to international chess. There is also no initial two-space move for pawns and no *en-passant* capture. A pawn promotes to a gold general; a promoted pawn is usually known as a "Tokin".

2.1.2 The opening setup

The opening setup for shogi is as follows:

```
   9    8    7    6    5    4    3    2    1
+---------------------------------------------+
| wL | wN | wS | wG | wK | wG | wS | wN | wL |   a
+---------------------------------------------+
|    | wR |    |    |    |    |    | wB |    |   b
+---------------------------------------------+
| wP | wP | wP | wP | wP | wP | wP | wP | wP |   c
+---------------------------------------------+
|    |    |    |    |    |    |    |    |    |   d
+---------------------------------------------+
|    |    |    |    |    |    |    |    |    |   e
+---------------------------------------------+
|    |    |    |    |    |    |    |    |    |   f
+---------------------------------------------+
| bP | bP | bP | bP | bP | bP | bP | bP | bP |   g
+---------------------------------------------+
|    | bB |    |    |    |    |    | bR |    |   h
+---------------------------------------------+
| bL | bN | bS | bG | bK | bG | bS | bN | bL |   i
+---------------------------------------------+
```

Here, "b" stands for "black" and "w" stands for "white", so that, for instance, "bL" means "black lance". The numbers above the files and the letters to the right of the ranks represent the most common notation system used for shogi by westerners (the Japanese also use Arabic numerals for the files but use Japanese numerals for the ranks).

2.1.3 Promotion of pieces

In sharp contrast to international chess, where only pawns can promote to higher-ranked pieces, most of the pieces in shogi can promote. The promoted ranks are discussed in the section on piece moves (see Section 2.1.1 [The moves of the pieces], page 14) but are repeated here for reference:

Pawn promotes to gold general (called a 'tokin' in this case only).

Lance promotes to gold general.

Knight promotes to gold general.

Silver general
: promotes to gold general.

Gold general
: does not promote.

Bishop
: promotes to "dragon horse" or just "horse" for short. The horse can move as a bishop or can move one square in any orthogonal direction.

Rook
: promotes to "dragon king" or just "dragon" for short. The dragon can move as a rook or can move one square in any diagonal direction.

King
: does not promote.

The three ranks furthest away from each player constitute his/her "promotion zone". A player may, but is not required to, promote a piece after making a move in which the piece begins and/or ends in the promotion zone. Thus you can promote a piece when moving the piece into the promotion zone, out of the promotion zone, or entirely within the promotion zone. Promotion is mandatory in these cases:

1. You must promote a pawn or a lance after moving it to the last rank.
2. You must promote a knight after moving it to either of the last two ranks.

These forced promotions ensure that a piece cannot be moved to a square from which it would have no further move.

Pieces "dropped" onto the board (see Section 2.1.4 [Drops], page 16) always drop in the unpromoted state, even if they drop into the promotion zone.

2.1.4 Drops

When a player captures a piece, that piece is not removed from play. Instead, it becomes the property of the capturer and can re-enter play by being placed on (almost) any vacant square during the player's move. This is known as a "drop" and counts as a full move (in other words, you can either move a piece on the board or drop a piece onto the board during your move, but not both). All pieces drop in the unpromoted state. Pieces may be legally dropped in their promotion zone, but they do not promote on that turn.

There are several restrictions on drops:

1. A pawn may not be dropped onto a file if there is already an unpromoted pawn belonging to the same player on that file. It is legal to drop a pawn on a file which contains a *promoted* pawn belonging to the same player, however.
2. A pawn may not be dropped to give immediate checkmate on the move. A pawn is, however, permitted to be moved on the board to give immediate checkmate. This is a curious rule, and if anyone knows the reason for it I would appreciate it if they would contact me and explain it to me :-)
3. A pawn or piece may not be dropped onto a square from which they would have no legal move. This means that pawns and lances may not be dropped onto the last rank, and the knight may not be dropped onto the last or second-to-last rank.

It is entirely permissible (and often advisable) to drop a piece or pawn between one's King and an attacking ranging piece. For this reason, the final checkmating move is nearly always an attack on the King from an adjacent square (except for an attack by a Knight).

Captured pieces are said to be pieces "in hand".

The drop is the primary distinguishing feature of Japanese chess, shared with no other popular chess-type game. It gives shogi a very aggressive quality, and dramatically increases the number of possible moves once a few pieces have been captured. Another interesting feature of shogi is that exchanges complicate play rather than simplifying it (as in international chess), because of the drop rule.

2.1.5 Winning the game

A game of shogi is won by capturing the opponent's king. In general, this is done by checkmating the king: attacking the king in such a way that the king cannot be defended no matter what the defending player moves. Note, though, that there is no rule that requires a player to defend a king which is being attacked. However, if he does not defend his king, the opponent is entirely free to capture it on the next move, thus winning the game. As in international chess, in practice most games end by resignation when one player realizes that he cannot escape checkmate.

2.1.6 Draws

There are very few draws in shogi; only about 1-2% of professional games end in a draw. One reason for this is that material can never be depleted as in chess, because captured pieces are constantly re-entering play as a consequence of the drop rule. In fact, most of the ways a game can be drawn in chess are not allowed in shogi:

- Draws cannot be offered.
- There is no fifty-move rule.
- A stalemate counts as a win for the stalemater. Stated otherwise: if you can't move, you lose.
- Perpetual check is illegal (see below).

There are only two legal ways in which a draw can occur:

1. A position (including the pieces in hand) occurs 4 times with the same player to move (called "Sennichite"). However, if this is caused by consecutive checks (direct attacks on the King, threatening to capture it on the next move) by one side, the player giving these checks loses the game. In other words, perpetual check results in a loss for the attacker who recreates the same position the 4th time.
2. Both players have moved their King into the the promotion zone (or they cannot be prevented from doing so) and the Kings cannot be checkmated. A King who has entered the promotion zone is known as an "entering King"; due to the forward orientation of most shogi pieces, it is very hard to mate such a King. In that case the players may decide to count their pieces as follows: the King does not count, the Rook and Bishop count as 5 points, and all other pieces as one point. Promotion is disregarded. If both

players have at least 24 points the game is a draw (called "Jishogi"). If a player has less, he loses the game.

Of course, a player can refuse to count pieces when he still has mating chances or chances to gain material which would affect the outcome of the counting. There is no strict rule about what to do if this is not the case, but nonetheless a player refuses to count up (e.g. because he does not have enough points for a draw). It has been generally accepted that in such a case the game ends and the pieces are counted after one player has managed to get all his pieces protected in the promotion zone.

2.1.7 Handicaps

Unlike international chess, shogi has a well-established handicap system which is used when players of different strengths play against each other. Handicaps range from small to huge, which makes it possible for weak players to play against even very strong players and have an even chance of winning.

Shogi players are ranked as follows: the weakest rank is around 15 "kyu", which represents a beginner. 14 kyu is higher than 15 kyu, 13 kyu is higher still, and so on until you get to 1 kyu. The next highest rank is 1 "dan", followed by 2 dan, 3 dan and so forth. The highest amateur rank is 6 dan; professionals go up to 9 dan. However, professional ranks are not the same as amateur ranks; a professional 1 dan is *much* stronger than an amateur 1 dan. This system is similar to that used by go players (and also other Japanese sports such as karate).

A handicap consists of the stronger player playing White and removing one or more pieces from his side of the board at the start of the game. These pieces are permanently removed from play; they are not in hand.

The following is a list of the accepted handicaps, from weakest to strongest. The degree of the handicap, represented by the position in the list, represents the difference in rank between the two players for which the handicap is appropriate. These rules are taken from the books "Shogi for Beginners" by John Fairbairn and "The Art of Shogi" by Tony Hoskings (see Chapter 5 [References and links], page 41) and, I believe, represent current Japanese practice.

1. The stronger player removes his left lance (on 1a).
2. The players play a two-game match; in the first game the stronger player removes his left lance (on 1a), while in the second game he removes his bishop.
3. The stronger player removes his bishop.
4. The stronger player removes his rook.
5. The stronger player removes his rook and left lance.
6. The players play a two-game match; in the first game the stronger player removes his rook and left lance (on 1a), while in the second game he removes his rook and bishop.
7. The stronger player removes his rook and bishop. This is usually called a "two-piece" handicap.
8. The stronger player removes his rook, bishop, and both lances. This is called a "four-piece" handicap.

9. The stronger player removes his rook, bishop, both lances, and both knights. This is called a “six-piece” handicap.
10. The stronger player removes his rook, bishop, both lances, both knights, and both silvers. This is called an “eight-piece” handicap.

Another advantage of playing handicap games is that the handicaps alter the optimal strategy for both players. For instance, handicaps all have their own opening lines which may bear little or no resemblance to those used in non-handicap shogi. This means that when learning handicap shogi, you are essentially learning completely new games which use the same equipment!

The reader may wonder how on earth a player giving an eight-piece handicap, say, could possibly hope to win. Don't forget, though, that in shogi the opponent's pieces can be captured and then become part of one's own army. Thus, if the opponent plays badly enough, the number of pieces will soon even out.

2.1.8 Notes for chess players

Here are a few miscellaneous things that may confuse chess players. Some of these have been mentioned elsewhere, but they bear repeating.

1. There is no queen.
2. Pawns capture the same way they move. There is no initial two-space pawn move and no *en-passant* move.
3. There is no special castling move. There *are* a large number of possible defensive formations referred to as “castles” (see Section 2.2 [Sample game], page 19) but there is no need for special moves to create them.
4. A given piece can only promote to *one* other kind of piece.

2.2 Sample game

This game was annotated by Pieter Stouten (see Chapter 5 [References and links], page 41). I have made some minor corrections. Note that captures are denoted by the “x” symbol e.g. Rx3f and drops are denoted by the “*” symbol e.g. R*3f. Check is indicated by a “+” after the move, e.g. R3f+. I recommend you use gnushogi/xshogi to play along with this game. In xshogi simply hit the “Force Moves” button after starting up, while in gnushogi enter the word “force” at the prompt. This will allow you to enter moves for both sides.

Note also that the move numbering system used here is the chess-type system where one move means one move by each player. The Japanese count one move made by each player as two moves.

Below you will find (the English translation of) an annotated game which was published in the Dutch Shogi magazine “81” and in the Dutch beginners booklet. It has proven to be a very useful game to explain some basic principles of Shogi. Also, it is a rather straightforward game compared to professional games where in most cases very diffuse middle game fights take place.

Pieter Stouten, 14th May 1990.

Black: Michael Trent (1-dan). White: David Murphy (2-dan).

1. P2f P3d 2. P2e B3c

[This move is necessary, as otherwise white can exchange pawns: 3. P2d Px2d 4. Rx2d. He would thus get a pawn in hand and open up his rook file.]

3. P7f P4d

[White closes the bishop diagonal again. He plans to play ranging rook (the rook goes to 5b, 4b, 3 or 2b; a defensive strategy) and in that case he'd better avoid an exchange of bishops. One of the reasons is that he will have problems developing his pieces without leaving holes for bishop drops.]

4. S4h R3b 5. P3f S4b 6. K6h K6b

[In general the rook plays an important role in the attacks. It is wise to move the king away from the area where the initial fights will be and both players act according to the Shogi proverb "keep the rook and king apart".]

7. K7h K7b 8. P5f P5d 9. G4i-5h G4a-5b

[Both players use their second gold general to build their castle.]

10. S6h

[In itself this move is not bad. However, it will become clear that black plans a quick attack and in that case it is wiser to omit this move.]

10... S5c 11. P1f P1d

[The advance of the edge pawns must be timed very well. The remark at black's tenth move applies here too: this move is good if black wants to play a slow game, because it eliminates a future B1e.]

12. P4f K8b 13. N3g S7b

[Black develops his knight in order to start an attack over the second, third and fourth files. White strengthens his king's position and awaits the attack. He aims at a counterattack as soon as black has broken through into the white camp. Probably white's breakthrough will take place later, but he has good compensation in the form of a stronger castle. This theme occurs very often in static rook versus ranging rook games.]

14. P4e R4b

[Black starts his attack and white puts up a very passive defence. His rook has a hard task now to penetrate the black position. Moreover, he blocks his own bishop. It seems much better to start a counterattack with 14... P3e, later to be followed by B2b, B5a or Bx4d in order to use his rook more actively.]

15. Px4d Sx4d 16. P*4e S5c

[16... Sx4e is more active. A silver general is normally more valuable than a knight, but white gets two pawns in hand and black none, while the knight might come in handy for white too.]

17. Bx3c+ Nx3c 18. P2d Px2d

[Black threatens to break through and white has to consider taking the pawn on 2d or starting a counterattack with Nx4e. If he chooses the latter, black can play Px2c+ followed by +P3c. The disadvantage is the black “tokin” (=promoted pawn) that white will get in his camp; the advantage is that it will cost black two more moves to promote his rook. Because white did not trust that the result after engaging in a “semeai” (=mutual attack) with 18...Nx4e would give a positive result, he captured the pawn on 2d. Making the right decision in moments like this often makes the difference between a win and a loss: miss one attacking chance and you will be forced to defend the whole game until the unavoidable defeat; on the other hand, an unsound attack can destroy all “aji” (=potential, meaning possibilities, threats) without getting anything in return.]

19. Rx2d Nx4e 20. Nx4e Rx4e 21. R2a+ P*4g

[Now it becomes clear why black’s 10. S6h was not good. Had this move been omitted, then white would not have had the time to play 13... S7b and after R2a+ the gold on 6a would hang. Thus black would have kept “sente” (=initiative). Instead of 21... P*4g, B*6d is a very good move, because after 22. P*2h black does not have a pawn in hand anymore and he is being threatened with the annoying 22... N*4f 23. G5g N3h+ 24. S4g +N4h also. Black can also counter 21... B*6d with 22. N*3g. White would then reply with 22... R4b 23. B*3c P*4g 24. Bx4b+ Sx4b. The white rook has played its role and instead of spending moves on saving it white starts to scatter black’s defences by successive pawn drops on the fourth file: 25. Gx4g P*4f 26. G5g N*6e 27. G5h P4g+ 28. Gx4g P*4f. This analysis was provided by Kato Hifumi, 9-dan professional (the highest regular grade). Destroying the coherence of the enemy pieces (their shape) by dropping pawns is one of the most important Shogi techniques. With the actual move 21... P*4g white missed a good chance.]

22. Sx4g P*4f 23. B*3g Px4g+ 24. +Rx6a +Px3g

[23. B*3g seems pointless, but a closer look reveals that it is actually quite mean. On move 24 white cannot capture black’s “Ryu” (=dragon =promoted rook) with his silver: 24... Sx6a 25. N*7d K7b 26. G*8b mate. By attacking the front of the white castle and threatening to mate him there, black has the chance to break down the white defences from the side.]

25. +Rx5b S*6b

[Here 25... B*4d would be much better, because it is defensive and attacking at the same time. After e.g. 26. G*4c Bx9i+ 27. Gx5c black threatens 28. +Rx7b Kx7b 29. S*6a K8b 30. S*7a Kx7a 31. G*7b mate. White is one move quicker, however. He has the following beautiful “tsume” (mating sequence where every move is check): 27... N*8f 28. Px8f S*8g 29. Kx8g B*9h 30. K7h Bx8i+ 31. K8g +B8i-8h 32. K9f L*9e mate. This illustrates the sharpness of Shogi: one move can make the difference between winning and losing.]

26. P*4f Rx4f

[This move eliminates white’s last chances. 26... R4b 27. +Rx4b Sx4b 28. R*4a seems annoying, but after 28... B*3c 29. S7g B*3b white wins the rook and with his “tokin” on 3g there still is some hope.]

27. N*6e +P4g

[White cannot defend anymore, so he starts a desperate attack. Black does not lose the right track, however.]

28. Nx5c+ +Px5h 29. +Nx6b +Px6h 30. Gx6h N*8f 31. Px8f B*6i 32. Gx6i R4h+ 33. N*6h +Rx6h 34. Gx6h S*8g 35. Kx8g N*9e 36. K7h Resigns

[White resigns here, because after 36... B*8g 27. K7g his attack has petered out.]

2.3 Mating problems

One good way to improve at shogi is to solve mating problems. There are several types of these problems, but the most common is called a "tsume-shogi" problem, or "tsume" problem for short. In a tsume problem, all pieces that are not on the board are assumed to be in the opponent's hand (except for your King, which is usually not shown). Every move you make must be check until the final checkmate. Your opponent may play any piece on the board or drop any of his pieces in hand in order to prevent the mate. In a properly constructed tsume problem, all of your pieces on the board and in hand must be essential to the solution. One consequence of this is that all of your pieces in hand must be played during the solution. There should only be one correct solution for the given number of moves. Tsume problems use Japanese-style move numbering; thus, a problem where you move (and give check), your opponent moves, and you move to give checkmate is called a three-mover. Here is a really trivial three-mover:

```
   3    2    1
----------------+
 |    |    |    |  a
----------------+
 |    |    | wK |  b
----------------+
 |    |    |    |  c
----------------+
 | bN |    |    |  d
----------------+
 |    |    |    |  e
----------------+
 |    | bN |    |  f
----------------+
Black in hand:  2G
```

Here, Black plays G*2b, White plays K1c, and Black plays G*1d mate. More typical tsume problems range from 5 moves to arbitrarily high numbers of moves, and they can be quite brain-busting. Tsume problems may seem artificial, but in the closing stages of the game where both players have a lot of pieces in hand, it is often necessary to give check at every move, or else your opponent will start a counterattack and will mate you before you mate him. A tsume problem is a worst-case scenario for the attacker: you have to mate your opponent even though he has every piece not on the board in hand, which means you have to develop sharp attacking skills. Many more tsume problems can be found on the internet; I particularly recommend Patrick Davin's "Shogi Nexus" (see Chapter 5 [References and links], page 41).

2.4 Shogi variants

Several historical variants of shogi exist. Most of these were invented before modern shogi (in some cases hundreds of years before), are much larger than modern shogi and are not played with drops. Thus, in many ways they are really more like giant chess games than like modern shogi. The only one of these games to have survived in Japan is Chu (middle) shogi, which is still played a little bit. Thanks to the efforts of George Hodges and John Fairbairn of the Shogi Association (two British shogi enthusiasts), these games were resurrected and rules and sets for them can still be purchased from George Hodges (see Chapter 5 [References and links], page 41). I hope to eventually extend GNU shogi so that it can play at least some of these games. There are also several non-historical variants of shogi; I don't know much about them but you can find information about them on the internet (see Chapter 5 [References and links], page 41).

The historical variants include:

1. Tori (bird) shogi, played on a 7x7 board with 32 pieces in all; this is the only variant that is known to have been played with drops.
2. Wa shogi, played on an 11x11 board with 54 pieces. This game can be played with or without drops but the historical evidence favors the view that it was played without drops. However, most people who have tried it claim it is a much better game with drops, being even more intricate than standard shogi.
3. Chu (middle) shogi, played on a 12x12 board with 92 pieces. This was (and is) by far the most popular of the variants, and has 21 different kinds of pieces in the starting line-up alone (along with several others that appear upon promotion). Unlike modern shogi, there are a tremendous number of ranging pieces and the game is definitely not played with drops. There is also an amazing piece called the Lion which has a double king move and can capture two pieces at once! Chu shogi has a small but fanatical following, some of whom consider it better than modern shogi.
4. Dai (great) shogi, played on a 15x15 board with 130 pieces. Other than the larger board, this game is very similar to Chu shogi.
5. Tenjiku (exotic) shogi, played on a 16x16 board with 176 pieces. This game is possibly the most complex tactical game in existence. There are many astoundingly powerful pieces, including one (the Fire Demon) that can capture up to eight opposing pieces in a single move! Despite the size of the game, checkmates can occur very suddenly (and often very early on) if one player makes a wrong move. Tenjiku also has a small but fanatical following, one of whom (Colin Adams) has written a book on the game which is available for download at `http://www.colina.demon.co.uk/tenjiku.html`.
6. Dai-dai (great-great) shogi, played on a 17x17 board with 192 pieces. The opening setup alone has 64 different kinds of pieces! This game and the larger ones that follow sound pretty outlandish, but they have actually been played; a game of Dai-dai can supposedly be played in about 12 hours.
7. Maka-dai-dai (great-great-great) shogi, played on a 19x19 board with 192 pieces. For those for whom Dai-dai shogi is just too small :-)
8. Tai (grand) shogi, played on a 25x25 board with 354 pieces! Until recently, this was thought to be the biggest chess game ever devised, but now there is...

9. Kyoku tai (extremely grand?) shogi, played on a 36x36 board with 402 pieces. The rules for this have just been unearthed in an old Japanese book. Hopefully someone will soon organize a postal Kyoku tai shogi championship; maybe their distant ancestors could finish it :-)

   It is thought that the really huge games (Dai-dai and up) were never really played to any significant extent (gee, wonder why?) and were devised merely so that the creators could have the fun of inventing enormous games, amazing their friends and confounding their enemies. However, the games up to Tenjiku shogi at least appear to be quite playable, assuming one has the time.

2.5 Differences between shogi and chess

Some differences between shogi and international chess have been mentioned elsewhere in this document; I summarize them here for people who are interested in game comparisons. I won't try to deal with the thorny question of which game is "better" although my bias may have already come through :-) In fact, the drop rule makes the two games so different in character that arguing over which game is better is like comparing apples to oranges (you'd be better off comparing chess to Chu shogi (see Section 2.4 [Shogi variants], page 23). However, I believe that if you are a chess fan you'll really like shogi as well, and shogi is also popular with many people who don't particularly like chess.

Here are the significant differences between chess and shogi:

1. In shogi, captured pieces become the property of the capturer and can re-enter play by being dropped onto almost any vacant square. In chess, captured pieces are out of the game. Thus, in shogi, piece exchanges complicate the play significantly while in chess they simplify it.
2. The shogi board is 9x9; the chess board is 8x8.
3. Shogi has five pieces with no counterpart in chess: the gold and silver generals, the lance, the promoted rook and the promoted bishop. Chess has one piece with no counterpart in shogi: the queen. The knight's move in shogi is much more restrictive than in chess. Pieces in shogi generally have a much smaller range of movement than in chess (unless they are in hand).
4. In shogi, all pieces except the gold general and the king can promote, but only to one kind of piece. Promotion is easier in shogi because the promotion zone is closer to the starting position of the pieces (especially pawns). In chess, only the pawn can promote, but it can promote to any other piece except the king.
5. In shogi, pawns capture the same way they move. There is no initial two-space pawn move and hence no *en-passant* captures. In chess, pawns capture diagonally which means that opposing pawns can block each other.
6. In shogi, you only have one rook and one bishop. Note that the bishop is not restricted to only one "color" square (squares in shogi aren't colored, but never mind) because promoted bishops can also move one square orthogonally.
7. There is no special castling move in shogi. The term "castle" is used in shogi to denote a defensive formation consisting of (usually) three generals which protect the king.

There are many such castles (about 40 or so have names). See Section 2.2 [Sample game], page 19.

8. Draws are much rarer in shogi than in chess. Perpetual check is not allowed. Stalemate is a virtual impossibility, and is a loss for the stalematee.
9. Since pieces are never out of play in shogi, chess-type endgames involving only a few pieces do not occur.
10. Shogi games are generally longer than chess games (about 60-70 moves is typical).
11. Shogi has a well-developed handicap system which is in general use; chess does not.

The effects of all these differences on play include (in my opinion):

1. Piece/pawn structures in chess are more rigid than in shogi. Pawns block each other and pawns, once advanced, cannot ever retreat. In shogi, you can repair the hole caused by a pawn advance by exchanging the pawn and dropping it back where you want it. Thus shogi is more fluid than chess and less "structural".
2. Counterattack is MUCH more common in shogi than in chess. Games typically end in mutual mating attacks, where each player is trying to checkmate the other player before being checkmated himself. This makes tempo incredibly important and also makes sacrificial play quite common.
3. Attacks involving only ranging pieces are more a feature of chess than of shogi. A shogi attack typically uses a ranging piece or pieces to support an attack by short-range pieces (especially generals). It is very rare to mate a king with a non-adjacent ranging piece in shogi since the player whose king is threatened can almost always interpose by dropping a piece.

3 gnushogi

This section describes how to run the "gnushogi" program.

SYNOPSIS

gnushogi [[[-]a] [-b bookfile] [-B binbookfile] [-C] [-h langfile] [-L langfile] [-r length] [-R] [-s pathname] [-l pathname] [-S binbooksize] [-t] [-c size] [-T size] [-v] [-x] [-X] arg1 arg2]

DESCRIPTION

GNU shogi (gnushogi) plays a game of japanese chess (shogi) against the user or it plays against itself.

At startup gnushogi reads the binbook file if it is present. It then looks for a book file. If it is present it adds its contents to the binbook data. If the binbook file is writable a new combined binbook file is written.

Gnushogi is a modified version of the gnuchess program. It has a simple alphanumeric board display, or it can be used with the xshogi program under X windows. The program gets its opening moves from the file gnushogi.bbk which is located in a directory specified in the Makefile. To invoke the program type:

'`gnushogi -C`'
: simple curses based version

'`gnushogi -X (or just gnushogi)`'
: xshogi compatible version

'`gnushogi -R`'
: raw test display version

TIME CONTROLS

If one argument is given, it is the search time per move in [minutes:]seconds. So gnushogi 30 will generate one move every 30 seconds, while gnushogi 5:00 will generate one move every 5 minutes.

If two or more arguments are given, they will be used to set tournament time controls with the first argument of each pair being the number of moves and the second being the total clock time in minutes[:seconds]. Thus, entering gnushogi 60 5 will set the clocks for 5 minutes (300 seconds) for the first 60 moves, and gnushogi 30 3:30 will allow 3 minutes and 30 seconds for 30 moves.

gnushogi 30 5 1 :30 will allow 5 minutes for the first 30 moves and 30 seconds for each move after that. Up to 4 pairs of controls may be specified.

If no argument is given the program will prompt the user for level of play.

For use with xshogi see the documentation on that program. See Chapter 4 [xshogi], page 33.

BOOK

The book gnushogi.tbk consists of a sequence of openings. An opening begins with a line starting with a # (the rest of the line is a comment). Following this is a series of moves in algebraic notation alternating between black and white separated by whitespace. A move may have a ? after it indicating this move should never be made in this position. Moves are stored as position:move so transpositions between openings can take place.

HASHFILE

The hashfile if created should be on the order of 4 megabytes; you can create such a hashfile by typing "gnushogi -c 22" (see below). This file contains positions and moves learned from previous games. If a hashfile is used the computer makes use of the experience it gained in past games. Tests run so far show that it plays no worse with the hashfile than without, but it is not clear yet whether it provides a real advantage.

LEGAL MOVES

Note: Piece letters are determined by the language file. What is specified here is the default (English).

Once gnushogi is invoked, the program will display the board and prompt the user for a move. To enter a move, use the notation 7g7f where the first letter-number pair indicates the origin square and the second letter-number pair indicates the destination square. An alternative is to use the notation P7f where the first letter indicates the piece type (P,L,N,S,G,B,R,K). To promote append a + the type of the new piece to the move, as in 2d2c+ or P2c+. Note that you must use capital letters for the pieces by default.

COMMAND-LINE OPTIONS

'`-a`' Do not search on opponent's time.

'`a`' Do search on opponent's time.

'`-b` *bookfile*'
Use bookfile for opening book.

'`-B` *binbookfile*'
Use binbookfile for binary opening book.

'`-c` *size*' Create a new HASHFILE. File size is 2^size entries of approximately 65+? bytes.

'`-C`' Use curses-based display mode.

'`-h`' Do not use hashfile.

'`h`' Do use hashfile.

'`-l` *pathname*'
Pathname of the loadfile used with get or xget.

'-L *lang*' Use language lang from the file gnushogi.lang. If -L is not specified it uses the first language in the file.

'-P *plylevels*'
Number of plys to include in the binbookfile. For generating a binbookfile.

'-r *length*'
Rehash *length* times in searching entries for position in transposition table.

'-R' Use raw text display mode. This can be used for dumb terminals or for systems that don't have curses.

'-s *pathname*'
Pathname of the save file to use with the save command.

'-S *size*' Size of binbookfile for memory based books. For creating a binbookfile.

'-t' Show statistics for HASHFILE.

'-T *size*' Set the transposition table size to 2^size entries.

'-v' Show version and patchlevel.

'-x *value*' Use value as the evaluation window xwndw.

'-X' Use xshogi display mode (the default).

COMMANDS

In addition to legal moves, the following commands can be entered at the gnushogi prompt. Note: command names are determined by the language file and may vary with the implementation. The default language is English.

'alg' allow algebraic input (not implemented).

'Awindow' change Alpha window (default score + 90).

'Bwindow' change Beta window (default score - 90).

'beep' toggles beeping after each move (default: on).

'bd' updates the current board position on the display.

'book' turns off use of the opening library.

'both' causes the computer to play both sides of a shogi game.

'black' causes the computer to play as White, if the computer was to move first.

'bsave' saves a game to disk as a book textfile. The program will prompt the user for a file name.

'gamein' toggles game mode time control. Assumes the time specified for time control is the time for a complete game. Input with the level command should be the game time and the expected number of moves in a game. go command must be given.

'coords' show coordinates on the display (visual only).

'`contempt`'
: allows the value of *contempt* to be modified.

'`debug`'
: asks for a piece as color piece, as wb or bn, and shows its calculated value on each square.

'`debuglevel`'
: sets level of debugging output if compiled with debug options.

'`depth`'
: allows the user to change the search depth of the program. The maximum depth is 29 ply. Normally the depth is set to 29 and the computer terminates its search based on elapsed time rather than depth. If depth is set to (say) 4 ply, the program will search until all moves have been examined to a depth of 4 ply (with extensions up to 11 additional ply for sequences of checks and captures). If you set a maximum time per move and also use the depth command, the search will stop at the specified time or the specified depth, whichever comes first.

'`easy`'
: toggles easy mode (thinking on opponents time) on and off. The default is easy mode ON. If easy mode is disabled, the keyboard is polled for input every so often and when input is seen the search is terminated. It may also be terminated with a sigint.

'`edit`'
: allows the user to set up a board position.

  - # clear the board.
  - c toggle piece color.
  - . command will exit setup mode.
  - p3b place a pawn on 3b
  - p3b+ place a promoted pawn on 3b
  - p* place a pawn in hand (among the captured pieces)

  Pieces are entered by typing a letter (p,l,n,s,g,b,r,k) for the piece followed by the coordinate. Here, letter case is ignored.

  The usual warning about the language file applies.

'`exit`'
: exits gnushogi.

'`first`'
: tells the computer to move first. Computer begins searching for a move. (same as "go").

'`force`'
: allows the user to enter moves for both sides. To get the program to play after a sequence of moves has been entered use the "black" or "white" commands.

'`get`'
: retrieves a game from disk. The program will prompt the user for a file name.

'`go`'
: tells the computer to move first. Computer begins searching for a move. (same as "first").

'`hash`'
: use/don't use hashfile.

'`hashdepth`'
: allows the user to change the minimum depth for using the hashfile and the number of moves from the beginning of the game to use it.

'help' displays a short description of the commands and the current status of options.

'hint' causes the program to supply the user with its predicted move.

'level' allows the user to set time controls such as 60 moves in 5 minutes etc. In tournament mode, the program will vary the time it takes for each move depending on the situation. If easy mode is disabled (using the "easy" command), the program will often respond with its move immediately, saving time on its clock for use later on.

'list' writes the game moves and some statistics on search depth, nodes, and time to the file "shogi.lst".

'material'
toggle material flag - draws on no pawns and both sides < rook.

'new' starts a new game.

'p' evaluates the board and shows the point score for each piece. The total score for a position is the sum of these individual piece scores.

'post' causes the program to display the principal variation and the score during the search. A score of 100 is equivalent to a 1 pawn advantage for the computer.

'quit' exits the game.

'random' causes the program to randomize its move selection slightly.

'rcptr' set recapture mode.

'remove' backout the last level for both sides. Equal to 2 undo's.

'reverse' causes the board display to be reversed. That is, the Black's pieces will now appear at the top of the board.

'rv' reverse board display.

'save' saves a game to disk. The program will prompt the user for a file name.

'switch' causes the program to switch places with the opponent and begin searching.

'test' performs some speed tests for MoveList and CaptureList generation, and ScorePosition position scoring for the current board.

'time' set computer's time remaining, intended for synchronizing clocks among multiple players.

'tsume' toggle tsume mode. In tsume mode, not all possible moves will be generated. If a king is in check, only moves that get the king out of check are generated. If the king is not in check, only moves that give check to the opponent's king are generated.

'undo' undoes the last move whether it was the computer's or the human's. You may also type "remove". This is equivalent to two "undo"'s (e.g. retract one move for each side).

'white' causes the computer to play as Black; if the computer is to move first the go command must be given.

'`xget`' read an xshogi position file.

'`xsave`' save as an xshogi position file.

'`xwndw`' change X window. The window around alpha/beta used to determine whether the position should be scored or just estimated. Note: this has *nothing* to do with xshogi or X windows; the terms are completely separate.

4 xshogi

This section describes how to run the "xshogi" program.

SYNOPSIS

xshogi [options]

DESCRIPTION

xshogi provides an X11/Xt/Athena Widgets user interface for gnushogi. With xshogi you can play gnushogi, set up arbitrary positions, force variations, or watch xshogi manage a game between two shogi programs. Furthermore, it can be used as an interface between two players on different displays.

xshogi can also be used as a shogi board to play out games. It will read through a game file or allow a player to play through a variation manually (force mode). This is useful for keeping track of email postal games or browsing games off the net.

After starting xshogi, you can make moves by pressing mouse button 1 while the cursor is over a square with your piece on it and dragging the mouse to another square. If the move is illegal, gnushogi will not allow it. xshogi will then retract the move.

COMMAND-LINE OPTIONS

The following command line options also correspond to X resources that you can set in your .Xdefaults file.

'`[standard Xt options]`'
: xshogi accepts standard Xt options like -display, -geometry, and -iconic.

'`-tc or -timeControl minutes[:seconds]`'
: Amount of time for a set of moves determined by movesPerSession. If this number of moves is played within the time control period, xshogi resets the time clocks. Default: 5 minutes.

'`-mps or -movesPerSession moves`'
: Number of moves in a time control period. Default: 40 moves.

'`-st or -searchTime minutes[:seconds]`'
: Tell gnushogi to spend at most the given amount of time searching for each of its moves. Without this option, gnushogi chooses its search time based on the number of moves and amount of time remaining until the next time control. Setting this option also sets -clockMode to False.

'`-sd or -searchDepth number`'
: Tell gnushogi to look ahead at most the given number of moves when searching for a move to make. Without this option, gnushogi chooses its search depth based on the number of moves and amount of time remaining until the next time control. Setting this option also sets -clockMode to False.

'-clock or -clockMode (True | False)'
: Determines whether or not to use the clock. If clockMode is False, the clock does not run, but the side that is to play next is still highlighted.

'-td or -timeDelay seconds'
: Time delay between moves during "Load Game". This doesn't have to be a round number. Try -td 0.4. Default: 1 second.

'-nsp or -noShogiProgram (True | False)'
: If this option is True, xshogi acts as a passive shogi board; it does not try to start a shogi program, not even to check whether moves made in Force mode are legal. It also sets -clockMode to False. Default: False.

'-fsp or -firstShogiProgram program'
: Name of first shogi program. In matches between two machines, this program plays white. Default: "gnushogi".

'-ssp or -secondShogiProgram program'
: Name of second shogi program, if needed. In matches between two machines, this program plays black; otherwise it is not started. Default: "gnushogi".

'-fh or -firstHost host'
: Name of host the first shogi program plays on. Default: "localhost".

'-sh or -secondHost host'
: Name of host the second shogi program plays on. Default: "localhost".

'-rsh or -remoteShell shell_name'
: Some systems do not use rsh as the remote shell. This option allows a user to name the remote shell command. This should be done in the resource file.

'-mm or -matchMode (False | Init | Position | Opening)'
: Automatically run a game between firstShogiProgram and secondShogiProgram. If matchMode is set to Init, xshogi will start the game with the initial shogi position. If matchMode is set to Position, xshogi will start the game with the position specified by the loadPositionFile resource. If matchMode is set to Opening, xshogi will play out the opening moves specified by the -loadGameFile resource. If the -saveGameFile resource is set, a move record for the match will be saved in the specified file. Default: "False".

'-lgf or -loadGameFile file'
: Name of file to read a game record from. Game files are found in the directory named by the SHOGIDIR environment variable. If this variable is not set, the current directory is used unless the file name starts with a /.

'-lpf or -loadPositionFile file'
: Name of file to read a game position from. Position files are found in the directory named by the SHOGIDIR environment variable. If this variable is not set, the current directory is used unless the file name starts with a /.

'-sgf or -saveGameFile file'
: Name of file to save a game record to. Game files are saved in the directory named by the SHOGIDIR environment variable. If this variable is not set, the current directory is used unless the file name starts with a /.

'`-spf or -savePositionFile file`'
: Name of file to save a game position to. Position files are saved in the directory named by the SHOGIDIR environment variable. If this variable is not set, the current directory is used unless the file name starts with a /.

'`-coords or -showCoords (True | False)`'
: If this option is True, xshogi displays algebraic coordinates along the board's left and bottom edges. The default is False. The coordFont resource specifies what font to use.

'`-mono or -monoMode (True | False)`'
: Determines whether xshogi displays its pieces and squares with two colors or four. You shouldn't have to specify monochrome. xshogi will determine if this is necessary.

'`-pc or -pieceColor color`'
: Color specification for pieces suitable for XParseColor(). Default: #FFFFD7.

'`-sc or -squareColor color`'
: Same for squares. Default: #EBDFB0.

'`-wps or -westernPieceSet (True | False)`'
: Choose the Western style piece set.

'`-npb or -normalPawnBitmap file`'

'`-nnb or -normalKnightBitmap file`'

'`-nbb or -normalBishopBitmap file`'

'`-nrb or -normalRookBitmap file`'

'`-nkb or -normalKingBitmap file`'
: Names of the bitmap files for the bitmap piece icons.

'`-rpb or -reversePawnBitmap file`'

'`-rnb or -reverseKnightBitmap file`'

'`-rbb or -reverseBishopBitmap file`'

'`-rrb or -reverseRookBitmap file`'

'`-rkb or -reverseKingBitmap file`'
: Names of the bitmap files for the outline piece icons.

'`-debug or -debugMode (True | False)`'
: Turns on debugging printout.

OTHER X RESOURCES

'`initString`'
The actual string that is sent to initialize the shogi program can be set from .Xdefaults. It can't be set from the command line because of syntax problems. The default value is "new\nbeep\nrandom\neasy\n". The "new" and "beep" commands are required. You can remove the "random" command if you like; including it causes gnushogi to randomize its move selection slightly so that it doesn't play the same moves in every game. Even without "random", gnushogi randomizes its choice of moves from its opening book. You can also remove "easy" if you like; including it toggles easy mode off, causing gnushogi to think on your time. That is, if "easy" is included in the initString, GNU Shogi thinks on your time; if not, it does not. (Yes, this does seem backwards, doesn't it.) You can also try adding other commands to the initString; see the gnushogi documentation (see Chapter 3 [gnushogi], page 27) for details.

'`blackString and whiteString`'
These resources control what is sent when the Machine Black and Machine White buttons are selected. This is mostly for compatibility with obsolete versions of gnushogi.

Alternate bitmaps for piece icons can be specified either by choosing one of the built-in sets or with the file name resources described above. There are three built-in sets of piece bitmaps available, large (the default), medium, or small. It is easiest to select the set you prefer in the .Xdefaults file:

XShogi*boardSize: Medium

The font used for button labels and comments can be changed in the .Xdefaults file. You may want to choose a smaller font if you are using the small pieces:

XShogi*font: helvetica_oblique12

The font used for coordinates (when the showCoords option is True) can be set similarly:

XShogi*coordFont: helvetica_10

If you are using a grayscale monitor, try setting the colors to:

XShogi*pieceColor: gray100
XShogi*squareColor: gray60

COMMAND BUTTONS AND KEYS

'`Quit`' Quits xshogi. Q or q is a keyboard equivalent.

'`Reset`' Resets xshogi to the beginning of a shogi game. It also deselects any game or position files.

'`Flip View`'
inverts the view of the shogi board.

'`Hint`' displays a move hint from gnushogi.

'Load Game'
: plays a game from a record file. If no file is specified a popup dialog asks for a filename. Game files are found in the directory named by the SHOGIDIR environment variable. If this variable is not declared then the current directory is used unless the file name starts with a /. G or g is a keyboard equivalent. The game file parser will accept almost any file that contains moves in algebraic notation. If the first line begins with '#', it is assumed to be a title and is displayed. Text enclosed in parentheses or square brackets is assumed to be commentary and is displayed in a pop-up window. Any other text in the file is ignored.

'Load Position'
: sets up a position from a position file. If no file is specified a popup dialog asks for a filename. Position files are found in the directory named by the SHOGIDIR environment variable. If this variable is not declared then the current directory is used unless the file name starts with a /. Position files must be in the format that the Save Position command writes.

'Save Game'
: saves a game to a record file. If no file is specified a popup dialog asks for a filename. If the filename exists, the user is asked whether the current game record is be appended to this file or if the file should be replaced. Game files are saved in the directory named by the SHOGIDIR environment variable. If this variable is not declared then the current directory is used unless the file name starts with a /. Game files are human-readable, and can also be read back by the Load Game command. Furthermore, they are accepted as gnushogi text bookfiles.

'Save Position'
: saves a position to a position file. If no file is specified a popup dialog asks for a filename. Position files are saved in the directory named by the SHOGIDIR environment variable. If this variable is not declared then the current directory is used unless the file name starts with a /. Position files are human-readable, and can also be read back by the Load Position command.

'Machine White'
: forces gnushogi to play white.

'Machine Black'
: forces gnushogi to play black.

'Force Moves'
: forces a series of moves. That is, gnushogi stops playing and xshogi allows you to make moves for both white and black.

'Two Machines'
: plays a game between two computer programs.

'Forward'
: moves forward through a series of remembered moves. F or f is a keyboard equivalent.

'Backward'
: moves backward through a series of remembered moves. As a side effect, puts xshogi into Force Moves mode. B or b is a keyboard equivalent.

'Pause'
: pauses the clocks or (in Load Game mode) pauses the game being loaded. Press Pause again to continue. P or p is a keyboard equivalent.

'Edit Position'
: lets you set up an arbitrary board position. Use mouse button 1 to drag pieces to new squares, or to delete a piece by dragging it off the board or dragging an empty square on top of it. To drop a new piece on a square, press mouse button 2 or 3 over the square. This brings up a menu of black pieces (button 2) or white pieces (button 3). Additional menu choices let you empty the square or clear the board. You can set the side to play next by clicking on the Black or White indicator at the top of the screen.

'Challenge'
: allows you to make a two display game between two human players. Enter the display you want to connect to. If you are allowed to connect, a new board is displayed at the remote display. Challenge mode can only be stopped by pressing "quit".

'Select Level'
: allows you to reset the clocks for both players. Enter the number of moves and the number of minutes in which the moves should be done.

'Move NOW'
: force computer to stop thinking and to make the current best move.

'Iconify I, i, C or c'
: iconifies xshogi.

LIMITATIONS

If you press the Pause button during GNU Shogi's turn, xshogi will stop the clocks, but gnushogi will still make a move.

After a mate or draw when playing against gnushogi, if you back up with the Backward button, the clocks are reset (because gnushogi has exited and must be restarted).

The game parser recognizes only algebraic notation.

AUTHORS

Original authors of XBoard: Chris Sears and Dan Sears.

Enhancements for XBoard (Version 2.0): Tim Mann.

Conversion to XShogi (Version 1.1): Matthias Mutz.

Current maintainer: Mike Vanier.

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XShogi borrows its piece bitmaps from CRANES Shogi.

5 References and links

There are very few English-language books for people learning shogi. The two I recommend are:

1. *Shogi for Beginners, 2nd. Edition*, by John Fairbairn. This is a superb beginner's book in every way, covering all phases of the game. It was out of print for a long time, but has now been reprinted and is available either from Kiseido (`http://www.labnet.or.jp/~kiseido`) or from George Hodges (see below).
2. *The Art of Shogi*, by Tony Hoskings. This is one step up from the Fairbairn book. It covers a lot of ground, and is especially noteworthy for its detailed treatment of opening lines. You can order this book from Amazon.com's UK branch (`http://www.amazon.co.uk`).

Another book you may find is *Shogi: Japan's Game of Strategy* by Trevor Leggett. This book is very elementary and is somewhat outdated, having been published first in 1966. However, it does feature a paper shogi board and punch-out pieces, so if you want a really cheap shogi set you might pick this book up. It is still in print.

Two books that are no longer in print but are definitely worth getting if you find them are *Guide to Shogi Openings* and *Better Moves for Better Shogi*, both by Aono Teriuchi. They are published in a bilingual edition (English/Japanese) and are the only books on shogi in English written by a Japanese professional shogi player. John Fairbairn did the translation from Japanese to English.

Shogi sets are available from:

George F. Hodges
P.O. Box 77
Bromley, Kent
United Kingdom BR1 2WT

George also sells equipment for all the historical shogi variants (see Section 2.4 [Shogi variants], page 23) (except for Kyoku tai shogi) and also sells back issues of the magazine "Shogi" which he published for 70 issues in the late 70's to late 80's. This magazine is STRONGLY recommended; it contains more information about shogi in English than you will ever find anywhere else.

Here are some useful URLs:

Pieter Stouten's shogi page: `http://www.shogi.net`
: This is the main shogi-related site on the internet, with links to almost all the other sites.

Roger Hare's shogi page: `http://www.ed.ac.uk/~rjhare/shogi`
: This has lots of information, including full rules to most of the shogi variants.

Patrick Davin's Shogi Nexus: `http://www.vega.or.jp/~patrick/shogi/`
: There's lots of cool stuff on this site; my favorite is the extensive collection of Tsume-shogi (mating) problems, both for beginners and more advanced players.

Steve Evans' shogi page: `http://www.netspace.net.au/~trout/index.html`
: Steve has written a program that plays almost all of the shogi variants, unfortunately it only runs on Windows :-(

Hans Bodlaender's chess variant pages: `http://www.cs.ruu.nl/~hansb/d.chessvar`
: This page has an almost unimaginable variety of rules for different chess variants, including many shogi variants (historical and non-historical).

6 Acknowledgements

I would like to thank the following people:

- Matthias Mutz, who originally developed GNU shogi as a spin-off of GNU chess and who very kindly let me take over the maintenance of this very interesting project.
- Richard Stallman and the Free Software Foundation, for creating an organization where anyone can contribute software for the common good of all, for making GNU/Linux possible, and especially for writing emacs and gcc, without which my working life would be intolerable.
- Georges Hodges, for starting the Shogi Association in England, without which I would probably never have heard of shogi, for supplying shogi equipment, for publishing the excellent magazine "Shogi" (now sadly defunct), for personally answering all my silly questions by mail, and for being the ambassador of shogi to the West.
- Pieter Stouten, for having the most comprehensive shogi site on the World Wide Web (`http://www.shogi.net`), and for maintaining the shogi-l mailing list. Go to Pieter's web site for more information on subscribing to the list. Also thanks to everyone who contributes and has contributed to that list.
- Matt Casters, for testing GNU shogi. Matt and I will be working together on improving the solution engine in future versions of this program.

7 Bugs

The motto of GNU shogi is "100% bug-free or you don't pay!" :-) In the extremely unlikely case (*ahem*) that you do find a bug, please send me (Mike Vanier) an email at `mvanier@cs.caltech.edu`. Also, feel free to send me comments, complaints, out-and-out raves, suggestions, plane tickets to Hawaii, and/or large suitcases filled with unmarked, untraceable hundred-dollar bills.

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