How do you play?

Some basic issues of strategy

Some sample matches analyzed

A different kind of math circle inquiry
Inversé (2006) - User Review

My ranking for gameplay is: ★★★★★ ★★★☆ (7 out of 10)

My ranking for fun is: ★★★★★ ★★★☆ ★★★☆ (9 out of 10)

My ranking for quality of components is: ★★★★★ ★★★★★ ★★★★★ ★★★★★ ★★★★☆ (10 out of 10)

My overall ranking for this game is: ★★★★★ ★★★★★ ★★★★★ ★★★★★ ★★★★☆ (8 out of 10)
EACH PLAYER HAS 1 OF EACH
When played this piece has 6 possible orientations and many positions.

If your opponent has already played their piece then when you play the same piece your height must be different.
When played this piece has 6 possible orientations and many positions.

If your opponent has already played their piece then when you play the same piece your height must be different.
When played this piece has 6 possible orientations and many positions.

If your opponent has already played their piece then when you play the same piece your height must be different.
When played this piece has 3 possible orientations and many positions.

If your opponent has already played their piece then when you play the same piece your height must be different.
When played this piece has 3 possible orientations and many positions

If your opponent has already played their piece then when you play the same piece your height must be different
Players take turns playing on the grid.

1. If your opponent has already played their piece, then when you play the same piece, your height must be different.
2. Pieces of the same color cannot share a side.
3. Pieces of the same height cannot share a side.
Basic Strategy tradeoffs

PIECES CAN TAKE UP MORE OR LESS BOARD SPACE DEPENDING ON WHETHER THEIR HEIGHT IS LARGEST OR SMALLEST DIMENSION

PLAYING A PIECE TO TAKE LOTS OF SPACE DOES RESTRICT FUTURE PLACEMENTS OF OTHER PIECES BUT PLAYING A PIECE SMALL FORCES OPPONENT TO PLACE BIG IN AN EVER MORE CROWDED BOARD.
WINNER!
LET’S GO BACK
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**WINNER!**
GO BACK AGAIN
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WINNER!
QUESTIONS ABOUT INVERSÉ

What is the winning strategy? Does this involve going first or not?

Can the strategy be described reasonably?

Answer to the above might not exist – after all Games like chess and checkers don’t really have winning strategies – just tips on playing well.

What is the geometric significance of each piece?

Could the game be enhanced?
How can a computer help analyze INVERSE?

How would you list the possible placements for a piece?
How many ways can a piece be placed on a blank board?
How many ways could a piece be placed in a partially filled board?
How to tell if a winning move exists from a given place in a game?

Think about a tedious but systematic procedure that a machine can do

How to tell if winning is guaranteed in two moves from a given place in a game?
How to tell if winning is guaranteed in three moves from a given place in a game?
How to tell if winning is guaranteed in four moves from a given place in a game? How many checks are involved?
Are there shortcuts?

Suppose there is no guaranteed way to win in 4 moves but you want to get as large advantage as possible – what should you look at?
Do you think that the game developer thought of it this way?
OPENING MOVE IS RANDOM

Can see 4 moves ahead
To either win or avoid losing.
But otherwise plays randomly

Can see to play 1 move ahead
To either win or avoid losing.

Otherwise plays to simultaneously
Maximize options for its pieces while minimizing options
for opponent's pieces.
**OPENING MOVE IS RANDOM**

- Can see 4 moves ahead
- To either win or avoid losing
- But otherwise plays randomly

**Can see 1 move ahead**

- To either win or avoid losing.
- Otherwise plays to simultaneously
- Maximize options for its pieces while minimizing options for opponent's pieces
OPENING MOVE IS RANDOM

Can see 4 moves ahead
To either win or avoid loosing.

Can see 1 move ahead
To either win or avoid loosing.

But otherwise plays randomly

Otherwise plays to simultaneously
Maximize options for it’s pieces while minimizing options for opponent’s pieces.
OPENING MOVE IS RANDOM

Can see 4 moves ahead
To either win or avoid losing.

I can win in 4 or less

Can see 1 move ahead
To either win or avoid losing.
But otherwise plays randomly.

Otherwise plays to simultaneously
Maximize options for its pieces while minimizing options for opponent's pieces.

I can win in 4 or less.
OPENING MOVE IS RANDOM

Can see 4 moves ahead
To either win or avoid loosing.
But otherwise plays randomly

Can see 1 move ahead
To either win or avoid loosing.

I can play
At least 2 MORE

Otherwise plays to simultaneously
Maximize options for it’s pieces while minimizing options for opponent’s pieces.