Computer Draughts Evaluation

Wieger Wesselink

History

- +/- 1990: Truus, Flits, Damocles (Netherlands)
  Programs reach master level

- +/- 2000 Buggy (France)
  Programs reach grandmaster level

- Search depth is low
- Extreme amount of draughts knowledge
- Natural playing style

History

- +/- 2004 Dragon, Dam, Damage, ... (Netherlands)

  Programs become stronger by focusing on **brute force search** and using **endgame databases** (6 pieces).

- Search depth is high
- Little amount of draughts knowledge
- Horrible positional play

History

- 2007 Kingsrow (USA)

  Programs become even stronger using advanced **search techniques** and larger endgame databases (8 pieces).

- Search depth is very high
- Little amount of draughts knowledge
- Reasonable positional play

History

- 2015 Scan (France)

  Programs reach world champion level using **machine learning** (4x4 patterns, about 50000 eval parameters). An Elo improvement of about 100(!)

- Search depth is very high
- High amount of (artificial) draughts knowledge
- Natural positional play

Tactics

- In draughts tactics are very important (but less than in chess).

  https://www.facebook.com/maarten.vanleenen/videos/1267547506659869/

  Usually the search depth will be high enough to detect tactical threats.

  Too aggressive pruning (like it is sometimes done in chess programs) makes a program vulnerable for tactics.

Evaluation (1)

- Material advantage is very important.

  Losing a piece usually means losing the game. Piece sacrifices are rare.

  A king is roughly equivalent to 3 pieces.

Evaluation (2)

- Pieces in the center of the board are usually stronger than pieces in the corner.

Evaluation (3)

- Formations are important (for example three neighbor pieces on the same diagonal).

  They are needed to make exchanges, or to create threats.

Evaluation (4)

- The position should be balanced.

  For example it's dangerous to play most of the pieces to the left half of the board.

Evaluation (5)

- Outposts can be dangerous.

  An isolated front piece on the 6th row needs to be supported by enough defenders. Search depth is usually not sufficient to detect this.

Evaluation (6)

- Tempi need to be taken into account.

  When the pieces of a player are further advanced, in the endgame he/she will be earlier to make a king.

Evaluation (7)

- Break throughs need to be avoided.

  When a wing is not properly defended, the opponent can often make a break through by sacrificing a piece.

Quiet positions

- The leafs of the search tree should be quiet positions, since material balance is extremely important.

References

See

http://www.win.tue.nl/~wieger/dammen/2017/computer_draughts.html