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[Vajolet Towers](#) ^[5]

Vajolet and **Vajolet2**, are [UCI](#) compliant [open source chess engines](#) by [Marco Belli](#), written in [C++](#) and released under the [GNU General Public License v3](#). Vajolet, named after the [Vajolet Towers](#) in the [Dolomites](#), started its life in 2010 as [C#](#) engine ^[1]. When Marco worked through [Stef Luijten's](#) tutorial on [Winglet](#), *Writing a Chess Program in 99 Steps* ^[2] ^[3], he rewrote Vajolet in [C++](#) ^[4]. Vajolet 2.03 played the [International Gsei Web Tournament 2013](#) and qualified for the final of 8 Italian and 8 non Italian engines, where it lost from [iCE](#).

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Vajolet2

Vajolet2, first released in May 2014, was another complete rewrite in [C++11](#) ^[6]. Apparently, [Texel's Tuning Method](#) worked well for Vajolet2 ^[7].

Description

Board Representation

Vajolet2 is a [bitboard](#) engine and used a [kindergarten like](#) technique taken from [Winglet](#) ^[8] to determine [sliding piece attacks](#) with 32 [KiB](#) precalculated lookup tables[64][64] each on [ranks](#), [files](#), [diagonals](#) and [anti-diagonals](#), indexed by [square](#) and hashed line [occupancy](#) - the [inner six bits](#) multiplied by a [magic factor](#) and shifted right by the strange looking 57, while 58 is more natural to ensure a six bit index range, but factors are designed that the most significant bit of the 64-bit product will be clear ^[9]. Since June 2016 with Vajolet2 2.2 [sliding piece attacks](#) are determined by [Pradu Kannan's](#) implementation of [Magic Bitboards](#). Along with [piece lists](#), Vajolet2 performs a [staged legal move generation](#) ^[10].

Search

The [search](#) uses C++ [function templates](#) to distinguish between pure [alpha-beta](#) and [PVS](#), for the main search as well for [quiescence](#). Vajolet2 2.1, released in January 2016, applies [Lazy SMP](#) ^[11]. The list of [selectivity](#) features is quite huge.

Selectivity

- [Check Extensions](#)
- [Delta Pruning](#)
- [Futility Pruning](#)
- [History Leaf Pruning](#)
- [Late Move Reductions](#)
- [Late Move Pruning](#)
- [Mate Distance Pruning](#)
- [Mate Threat Extensions](#)
- [Multi-ProbCut](#)
- [Null Move Pruning](#)
- [Quiescence Search](#)
- [Razoring](#)
- [Restricted Singular Extensions](#)
- [SEE Pruning](#)
- [Sibling Prediction Pruning](#)
- [Static Null Move Pruning](#)

[Move Ordering](#)

- [Principal Variation Extraction](#)
- [Killer Heuristic](#)
- [History Heuristic](#)
- [Internal Iterative Deepening](#)
- [MVV-LVA](#)
- [Static Exchange Evaluation](#)

[Transposition Table](#)

- [Zobrist Hashing](#)
- [Four Bucket System](#)
- [Depth-preferred Replacement Scheme](#)

[Evaluation](#)

- [Material Balance](#)
- [Mobility](#)
- [Piece-Square Tables](#)

- [Tapered Eval](#)

[Pawn Structure](#)

- [Backward Pawn](#)
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- [Doubled Pawn](#)
- [Isolated Pawn](#)
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- [Pawn Shield](#)
- [Pawn Storm](#)
- [Square Control](#)

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- [Pawn Cache](#)

Misc

- [Center Control](#)
- [Loose Pieces](#)
- [Number of Pawn Rams](#) as [Blockage Indicator](#)
and more ...

See also

- [Geography](#)

Forum Posts

2010 ...

- [Vajolet Chess Engine](#) by [Marco Belli](#), [CCC](#), May 27, 2010
- [Re: Test 071112](#) by [Marco Belli](#), [CCC](#), November 10, 2012
- [vajolet 2.03 release](#) by [Marco Belli](#), [CCC](#), May 12, 2013
- [vajolet 2.48 released](#) by [Marco Belli](#), [CCC](#), November 21, 2013
- [floating point SSE eval](#) by [Marco Belli](#), [CCC](#), December 13, 2013 » [Evaluation](#), [Float](#), [Score](#)
- [where can I make my engine play against human?](#) by [Marco Belli](#), [CCC](#), February 16, 2014

- [Vajolet2 released](#) by [Marco Belli](#), [CCC](#), March 29, 2014
- [vajolet2 1.43 released](#) by [Marco Belli](#), [CCC](#), July 22, 2014
- [advanced tapered evalutation](#) by [Marco Belli](#), [CCC](#), August 08, 2014 » [SSE](#), [Tapered Eval](#)
- [vajolet2 1.45 release](#) by [Marco Belli](#), [CCC](#), August 15, 2014

2015 ...

- [Vajolet2 2.0 released](#) by [Marco Belli](#), [CCC](#), April 21, 2015
- [Vajolet 2.1 released](#) by [Marco Belli](#), [CCC](#), January 01, 2016
- [Vajolet, new version 2.2](#) by [Marco Belli](#), [CCC](#), June 19, 2016
- [vajolet2 2.3 release](#) by [Marco Belli](#), [CCC](#), February 28, 2017
- [Vajolet2 2.4 Release](#) by [Marco Belli](#), [CCC](#), November 19, 2017
- [Vajolet2 2.5 Release](#) by [Marco Belli](#), [CCC](#), January 25, 2018

External Links

Chess Engine

- [GitHub - elcabesa/vajolet](#)
- [vajolet chess engine - Google Project Hosting](#)
- [vajoletChess Blog](#)
- [Vajolet](#) « [G 6](#)
- [Vajolet](#) in [CCRL 40/40](#)
- [Vajolet](#) in [CCRL 40/4](#)

Misc

- [Vajolet Towers from Wikipedia](#)
- [Torri del Vajolet / Vajolet Towers : Climbing, Hiking & Mountaineering : SummitPost](#)
- [Vajolet Towers](#) by [Dietrich Belitz](#), July 29, 2004
- [Rosengarten group from Wikipedia](#)

References

1. ^ [Vajolet Chess Engine](#) by [Marco Belli](#), [CCC](#), May 27, 2010
2. ^ [Winglet, Writing a Chess Program in 99 Steps](#) by [Stef Luijten](#), [Wayback Machine](#)
3. ^ [Writing a chess program in xx steps](#) by [Stef Luijten](#), [CCC](#), April 18, 2011
4. ^ [Re: where to start chess programming?](#) by [Marco Belli](#), [CCC](#), June 22, 2014
5. ^ The Torri del Vajolet in the [Dolomites](#), [Fassa Valley](#), [Trentino](#), [Italy](#), seen descending from the [Rifugio Passo Santner](#). In the bottom at the right the [Rifugio Re Alberto](#), Photo by [Vincenzo Gianferrari Pini](#), August 8, 2000, [Vajolet Towers from Wikipedia](#)
6. ^ [Vajolet2 released](#) by [Marco Belli](#), [CCC](#), March 29, 2014
7. ^ [Re: Vajolet2 released](#) by [Marco Belli](#), [CCC](#), March 31, 2014
8. ^ [Writing a chess program in 99 steps - Move generation for sliding pieces](#) by [Stef Luijten](#),

[Wayback Machine](#)

9. [^](#) see Macros RANKATTACKS, FILEATTACKS, SLIDEA8H1ATTACKS, SLIDEA1H8ATTACKS, etc. in [vajolet2/source/browse/movegen.h](#), or inline functions attackFromRook and attackFromBishop in the more recent [vajolet/source/browse/movegen.h](#)

10. [^](#) [first achievement: MOVE GENERATOR](#)

11. [^](#) [Vajolet 2.1 released](#) by [Marco Belli](#), [CCC](#), January 01, 2016

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IGWT 2013	Jun 23, 2014
Marco Belli	Jan 6, 2018
TCEC Season 10	Jan 3, 2018
TCEC Season 11	Apr 18, 2018
TCEC Season 9	Nov 6, 2017
Vajolet	Jan 25, 2018
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