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NoraGrace Logo ^[3] ^[4]

NoraGrace,

a [WinBoard](#) compliant [open source chess engine](#) by [Eric Oldre](#), written in [C#](#) and first released in June 2014 under the [MIT License](#).

NoraGrace is dedicated to *Nora Grace Oldre* who was taken from Eric and his wife unexpectedly a few days before she was due to be born ^[1] ^[2] .

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Description

Board Representation

Like [Sinobyl](#), NoraGrace relies on [bitboards](#), and further has an [8x8 mailbox](#). It uses [magic bitboards](#) to

determine [sliding piece attacks](#) - factors were calculated from sparse 64-bit randoms. [BitScan](#) is implemented via 32-bit [De Bruijn multiplication](#) to conditionally branch on low and high [dwords](#). [Bitboard serialization](#) applies the C# [yield statement](#) ^[5], which is further used in various [move generation](#) routines. NoraGrace's [square mapping](#) has [ranks](#) from 8 to 1 mapped to 0-7 at the [big-end](#) over [files](#) from 'a' to 'h', square zero is a8:

0	1	2	3	4	5	6	7
8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47
48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63

NoraGrace's BERLEF Mapping

Search

NoraGrace applies [negamax alpha-beta](#) with [transposition table](#) and [quiescence search](#) inside an [iterative deepening](#) framework with [aspiration windows](#), enhanced by [adaptive null move pruning](#) with [verification search](#) in the [endgame](#), [extensions](#) if [SEE](#) > 0 for [checks](#) and [pawns to 7th rank](#), [futility pruning](#) and [LMR](#).

Evaluation

[Evaluation](#) takes [game phases](#) into account, using a [tapered eval](#) along with *PhasedScore* objects, interpreting the low and high 32-bit [double words](#) of a 64-bit long as two [SIMD](#) integers of an [endgame](#) and [opening score](#). Beside other features, NoraGrace considers [material](#), [piece-square tables](#), [king safety](#), [cached pawn structure](#) and [mobility](#).

See also

- [Given Name](#)
- [Sinobyl](#)

Forum Posts

- [New open source engine in C# - NoraGrace](#) by [Eric Oldre](#), [CCC](#), June 20, 2014
- [NoraGrace 2.0 \(c# engine\)](#) by [Eric Oldre](#), [CCC](#), November 22, 2014

External Links

Chess Engine

- [Ericoldre/NoraGrace-Chess · GitHub](#)
- [Releases · ericoldre/NoraGrace-Chess · GitHub](#)
- [NoraGrace 1.0 64-bit](#) in [CCRL 40/40](#)

Misc

- [List of Irish-language given names - Wikipedia](#)

References

1. [^](#) [New open source engine in C# - NoraGrace](#) by [Eric Oldre](#), [CCC](#), June 20, 2014
2. [^](#) [Perinatal mortality from Wikipedia](#)
3. [^](#) Logo by [Graham Banks](#) from a picture of Nora Grace Oldre's footprints
4. [^](#) [Re: Some others chess engines written in C#](#) by [Eric Oldre](#), [CCC](#), June 29, 2014
5. [^](#) public static IEnumerable ToPositions(this Bitboard bitboard) in [Bitboard.cs](#)

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Page	Date Edited
Engine releases	Apr 23, 2018
Engines	Mar 10, 2018
Eric Oldre	Jul 3, 2014
NoraGrace	Nov 23, 2014
Sinobyl	Jul 3, 2014

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