

In lieu of a foreword

This is a special book. You will not find many like this, or even a few ones. For the past 10 or so years, chess has changed tremendously, with the appearance of extremely strong chess programs, whose level is reputed to be way above that of the best humans. The existence of such programs, plus the availability of large knowledge databases allows us to look deeper into the game of chess. Gems of the past are now debunked, the widely acclaimed play of world champions like Capablanca, Alekhine, Kasparov and Carlsen appears to have lots of gaps, with a multitude of tactical mistakes throughout even their masterpieces.

Thus, we understand, there is something more to chess, something deeper, that should be investigated. On the other hand, chess computers do get improved on a regular scale, adding some 50 elo or so each and every year. This is yet another hint that we are still very far from perfection even with machines.

So, if machines play weak, and humans play weak, there should be certainly a lot of knowledge still undiscovered.

This book aims at doing precisely that: uncovering part of the secrets that still are not a general knowledge.

The book is split into 5 main chapters, covering material and major corrections to piece values, mobility, pawns, outposts, imbalances, king safety and general piece activity and coordination. Within these chapters, there are a lot of sub-sections allowing for better ordering of the text.

The book is provided with a table of contents and a complete alphabetical index of terms.

Each and every separate evaluation term is handled by giving its precise definition, an estimation of its relative value in centipawns, expanding on the properties of

the term, and then finishing with establishing its frequency in game situations. In this way, it is easier to investigate the material.

One centipawn is one hundred of a full pawn. As very small terms, with values smaller than 10cps, are indeed very difficult to make sense, in the book I have included just terms with larger value than that one, though, there are also a few features with a bit lower value, just to spice things up.

When looking at the values of different terms one should bear 2 things in mind:

- those are just approximations, it is very difficult to come up with a precise number for each and every term, there are so many terms, so interdependent, and so prone to personal outlooks

- the values, although also having general significance, will be fully valid only within the current evaluation framework and its pool of existing features. In a different framework, with a smaller or larger pool of terms, the specific values might be different.

The values are split between mg and eg. We are following more or less the general accepted definition of the boundary between mg and eg, i.e. half of the available piece material, so called non-pawn material, taking account of the material of both sides. Any other approach, like using queen presence, etc., is much less relevant, obviously. So, middlegames will be positions with total available non-pawn material for both sides more than half of the starting non-pawn material, and endgames positions with non-pawn material lower than half of the starting material.

The centipawn estimation is, although seemingly a bit unusual, quite natural what concerns refined evaluation factors, especially in the age of computer chess. With the progress of computer chess, it is

also believable, that our brain networks become more intricate too. If one centipawn is one hundredth of a full pawn, then 100cps will be equal to one pawn material, the winning or loss of a single pawn, 50cps will be the estimate of half a pawn material positional compensation, 25cps will be 1/4 of a pawn material positional compensation, and 10cps will be 1/10 of a full pawn.

As positional factors are so numerous and multi-faceted, it is only about natural that they have so different and refined scores. Not using such values will definitely miss quite a lot of the deeper essence of chess.

Besides, on the chess board, one usually has tens of different evaluation factors worth multiple centipawns each, but less than a pawn, so adding all of those will certainly make more than a full pawn material compensation, something measurable by all means.

Positive terms will score positive values, in centipawns, while negative ones, negative values, again in centipawns, but with a minus sign before the estimate.

The general rule is that term definitions, more specifically the placement of pawns, are given from the point of view of white, but figuring out the respective black condition is very easy, bearing in mind that the chess board is vertically symmetrical, so white's 1st rank is black's 8th, white's 2nd rank is black's 7th, white's 3rd rank is black's 6th, white's 4th rank is black's 5th, white's 5th rank is black's 4th, white's 6th rank is black's 3rd, white's 7th rank is black's 2nd, and white's 8th rank is black's 1st. In this way, a white pawn or piece on e4 will be tantamount to a black pawn or piece on e5, a white pawn or piece on e6 will be tantamount to a black pawn or piece on e3, a white pawn or piece on a1 to a black pawn or piece on a8, and a white pawn or piece on g7 to a black pawn or piece on g2. Psqt tables are white-side only, with conversion following the same rules.

The book is based on pattern recognition, rather than vaguer reflections on the quality of certain chess positions. My claim would be that, by using pattern recognition, it is possible to learn the basics of chess, as well as perfectionise, at least 4 times faster. And this is not an overstatement, in no way. Remembering, even by heart, if necessary, some 1000 or so main evaluation features, is undoubtedly the much more preferable way to go than following the advice of an innumerable quantity of chess handbooks and mast. Without pattern recognition, in spite of all the invested hard work at playing and investigating different games, knowledge will more or less remain blurred, so less efficiently used in practice.

When patterns are recognised, you might not need to play that many games and still be able to immediately see the properties of a position, indicating at the right move to make. Of course, there are no magical solutions to improving one's chess, no one would believe in a method preaching learning chess in a week or so, a lot of games should be played and positions analysed in order for a person to significantly improve one's tactical abilities, tactics is not perfectionised in a short time, but still, one can definitely significantly shorten one's way to the top by learning to recognise patterns.

Every chess position is basically a set of evaluation patterns. The best move is always available at the current ply, it is really not necessary to go deeper, doing any substantial search, all one has to do is to recognise all the relevant evaluation patterns making up a specific chess position. When you add up all available evaluation patterns, you should be able to come up with the solution what the best move is. Of course, in order to efficiently and flawlessly do that, one should be able to recognise all the subtleties of a position, and subtleties are hidden in the larger pool of non-standard, non-generally-recognised evaluation terms.

Someone might laugh at a range of terms I have enumerated, considering them as non-existing and the product of my ill imagination, but all of you would be surprised, if you knew how even the smallest of evaluation terms, worth some couple of centipawns or so, is capable of influencing the game. One more mobility square, added to one more square attacked of the enemy king shelter, and one more subtle pawn feature most persons would neglect already makes quite a lot and changes the course of the game as a whole.

In the book, there are over 500 diagrams and around 100 tables.

Concerning the diagrams, please bear in mind, that those are not simple fens, so do not check them with engines, they do not even have side to move. Rather, they are supposed to serve as an illustration accompanying specific features. Their purpose is just that: to illustrate the term.

What concerns psqt tables, well, those are meant just as indicative values, it is very difficult to have, of course, fully precise measurement of all 64 squares of a particular term, so take them with a grain of salt. Still, their usefulness is beyond any doubt, as an ad-hoc blanket value would be the much worse guess, sometimes even completely unrealistic and detrimental.

The target audience of the book are 4 categories of people:

- weak chess players
- intermediate chess players
- strong chess players
- chess engine programmers

Well, of course, weak chess players will be helped most, when following the approach of pattern recognition. In that way, they can cover couple of times faster the material they would otherwise take years to fully grasp and memorise. Memorising some 1000 feature patterns is definitely a lot less work than memorising many thousands of typical tactical positions and

positional approaches, not to mention the opening preparation.

Of course, one might do without any opening preparation at all, by just learning the successful opening feature patterns. That saves time, saves memorising a lot of theoretical stuff, but more importantly, lays a very sound theoretical opening foundation irrespective of the changing opening vogue, as the best opening moves are always one and the same, following the same patterns, and those will concentrate on just a few openings.

For the very same reasons, chess players of intermediate strength will find this book interesting. Although they are already supposed to know quite some stuff, no doubt these pages will still offer some useful additions to their knowledge, in the form of patterns they have never read about anywhere else.

I would be very much flattered, if some of the stronger players pay some modest attention to this handbook, too. Their first thought might be to totally dismiss a work of a relatively insignificant player with no track record at all, but here is where they might possibly be wrong. Because, on the pages of this work, there are terms and patterns I have never encountered in any other textbook previously. And the number of those is far from being negligible. So, I would be very happy for a quick browse and possible massive criticism.

Chess programmers will also find these pages useful, as within there are terms no one has ever published before. Psqt tables will also come in quite handy, as engines are very much accustomed to those. If anything, my approach is to only further stress the importance and ubiquity of psqt tables. The wider they are used, the better, but of course, the tuning challenge will be enormous. I very much hope, that this handbook will contribute to the future development of a range of chess engines, and with this, to the advancement of the

overall cause of chess, as chess enthusiasts all over the world will be using the very same engines the programmers prepare for daily game play and analysis.

useful in generating food for thought for alternative implementations.

July 2017

This book is the product of 5 years of almost incessant concentration on chess. Whenever possible, I have been playing and investigating chess for 12 hours daily and more. Playing chess games with Stockfish and Komodo. Browsing Stockfish and Komodo games, investigating different databases. Then, playing more games with Stockfish and Komodo, and browsing and analysing more and more of their games. Of course, I have also looked at least twice at most of the chess collections of all world champions. Without knowing the past, one can not concentrate on the future, of course.

My chess rating, 2100+ FIDE elo, 2200+ Bulgarian rating(Bulgarian candidate master from 1998), is indeed very negligible to suppose a person with such a strength to be able to write a book about chess, but the truth is, that it dates back 12 years. For almost 12 complete years, I have not been playing chess officially, so my rating stayed as it is, low, however, my actual strength has increased at least 4-fold. It is only after I finished playing tournament chess that much stronger engines, allowing to better train your skills, appeared, and in the last 5 or so years, engine strength reached its peak. So, I trained a lot my chess during the time I was an inactive player, and, in the last 5 years, I almost entirely devoted my time to chess. It is possible that I am a very strong chess player indeed, but currently, my abilities still have not been measured in any official way.

Since the appearance of the Stockfish framework, I have contributed a lot with ideas to it. At least 20 evaluation patches, based on my ideas, have been integrated in Stockfish code, and a lot more have been