The data-mining of studies database 'HHdbIV'

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In his recent Spotlight columns, Jarl Ulrichsen (2012a/b) made and later revisited a note that, to his surprise, it was still possible to find sub-7-man (s7m) positions in the studies of HHdbIV which signal cooks and/or duals. Particularly for those readers of EG who are similarly and in fact unnecessarily surprised, we explain here what exactly was done with the s7m-positions in creating HHdbIV.

The first author decided to examine the s7m positions in the mainlines of the studies in HHdbIII. The two goals, in priority order, were to examine the correctness and uniqueness of White’s move, that is, to identify:

- those mainline positions with values incompatible with the stipulation of the study,
- those mainline positions where there were alternative moves which preserved value.

The set of win studies with s7m positions in the mainline was identified using CQL (Costeff, 2003) and the lines were converted into lists of positions using the utility PGN2FEN (Foden, 2010). These positions were regrouped in line with the studies they came from and the non-redundant positions with at least 7 men were discarded. The same process also created a set of mainline positions from draw studies.

Both sets of positions were evaluated using Nalimov’s DTM Endgame tables by Eiko Bleicher (2012), both with the side-to-move and, because the frequency of zugzwangs was also of interest (Haworth et al, 2011b), with the opposite side-to-move. The information was sent to Harold van der Heijden who, it transpired, was in the final stages of publishing HHdbIV. He asked for the ‘HHdbIV studies’ that were not in HHdbIII to be evaluated as well. It was then clear that 3,068 studies contained between them some 18,741 s7m mainline positions whose value was incompatible with the stipulation of the study. In some cases, it was the stipulation that was wrong (i.e. data entry error).

Details of the data-mining exercises have been published (Bleicher et al, 2010; Haworth et al, 2011a). In a few months, Harold transformed almost all the ‘wrong position value’ information into ‘@-indicators’ in HHdbIV with comments on a selection of moves as to what would have been the right move for White. The first author would therefore like to suggest that the attributions to cook-authors ‘GH/EB’, over 5,100 of them, should be changed in HHdbIV to ‘GH/EB/HH’. Harold also led in the publication of two articles in EG (Van der Heijden et al, 2010a/b) which focused on the chess aspects of some chosen cooked studies.

To emphasise the status of the work prior to the publication of HHdbIV, the first author did not examine the values of s7m positions in studies’ sidelines. This was because no automatic method was known for determining whether a position was meant to be won or drawn. Further, there was no time before the publication of HHdbIV to process the data about alternative value-preserving moves as this requires a mix of difficult, automatable but not yet automated, technical assessment (Haworth and Rusz, 2012) as well as artistic, chessic judgement.

It is worth putting the incidence of equi-optimal and suboptimal moves into context by distinguishing four types of mainline position. In 150,649 of 234,634 s7m positions, the value-preserving move is absolutely unique.
59,409 positions, the DTM-optimal move is unique but there are DTM-suboptimal moves, and one of the latter was played in 8,167 positions. In 13,186 positions, there are only alternative equi-optimal moves. In 11,390 positions there are both equi-optimal moves and DTM-suboptimal moves, and one of the latter was played in 1,665 cases.

There were 320,579 DTM-suboptimal moves available, and 9,832 cases of one being chosen, indicating a dual of some sort if not a chessic or data entry error. These include missed mates in 1 (25), in 2 (67), in 3 (90), in 4 (129) and in 5 (172), many not remarked on to date. One might conjecture that the shallower the DTM-depth and the greater the DTM-concession, the greater is the error likely to be. Many DTM-suboptimal moves will in future be proved to be merely time-wasting moves, allowing repetition of position or no better progress to the next mainline position.

There are 24,576 positions involving 44,227 equi-optimal moves where the downstream-convergence (or lack of it) of those equi-optimal moves should be examined.

When the technical assessment aspect has been automated in a relatively small production process (Haworth and Rusz, 2012), there will be an increased opportunity for the endgame community to make both technical comments and artistic judgements, particularly about the seriousness of duals.

The endgame scenario is likely to take one step forward soon as a set of, as yet unverified, DTM EGTs for 7-man chess has been created (Haworth, 2012; MVL, 2012). Lists of 7-man positions are to hand.

Most of the duals spotted (see Table) are boring from an artistic point of view, but there are some exceptions:


(D.1.1) Borisenko

3rd prize \textit{Narodnaya Tribuna} 2003

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We concentrate on the main line:
1.a7
g1Q 2.Se2+ Kf2 3.Sxg1 h2 4.Sh3+ Kg3 5.Sf2
Kxf2 6.a8Q Kg1 7.Qa1+ Kg2 8.Qb2+ Kg1
9.Kxh4 h1Q+ 10.Kg3
wins.

This is the position after move 6:

The EGTB indicates three winning moves:
7.Qa1+ (solution) with a DTM of 14 moves,
7.Qa7+ DTM: 14 and 7.Qg8+ DTM: 13
moves. Many people now jump to conclu-
sions: 7.Qg8+ must be a cook as the EGTB in-
dicates a shorter DTM.

Let’s examine the optimal moves: 7.Qg8+
Kf2 8.Qd5 Kg1 9.Qg5+ Kf1 10.Qxh4, and
now we are in a very interesting critical posi-
tion: (see diagram next column)

Now the EGTB indicates that 10…Kc2!? is
the optimal move for Black with a DTM of 9
moves. Of course, an o.t.b. player would never
consider this move since 11.Qxh2 is an imme-
diate win. The more natural move is 10…Kg2
(DTM 8) 11.Qe4+ Kg1 12.Qe1+ Kg2 13.Kg4
h1Q 14.Qe2+ Kg1 15.Kg3

(at move 15) is almost identical to the main
line (at move 10!) and has the same idea. So
8.Qg8+ is merely a time wasting dual. That
seems to be strange, because Black did not
play DTM-optimally in this line. The explana-
tion is that, in the solution, Black plays the
natural 8…Kg1 (DTM 8), while 8…Kg3 (DTM
12) is optimal. But this also is a weak move to
an o.t.b. player who would quickly find 9.Qb7
followed by 10.Qh1 leaving Black without
any chance.

In conclusion, one should keep in mind that
a DTM-optimal defence may be a very stupid
move for a player or endgame study compos-
er. Every claim based on an EGTB needs to be
thoroughly examined, even if the EGTB indi-
cates that the alternative has a shorter DTM.

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