The Go Ranking System of Bjorn Goldis

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In previous articles of this series, from the statistical distribution of results of even games, published for Go in Europe by Ales Cieply, we observed that a logarithmic relation apparently exists between stone-handicap and Elo ranks, when the latter are based on winning probability. I wrote a possible function with this shape, without however believing to have found the precise relation existing. Then, while examining the absolute scale proposed by Walther Schmidt, we have seen that Elo himself had suggested an absolute scale for playing strength and ranking – easier to use in its logarithmic form – even though no association of sports or games is known ever to have adopted it.

Now, we have to discuss a system, which has been proposed independently, but may be considered to proceed in that direction. Its author is Bjorn Goldis, who graduated in Philosophy and Computer-Information Science. He was born in France, 1959.

He now lives in Florida, U.S.A., after having lived in several European and Asian countries, and a few American States. Let me acknowledge his patient assistance in clarifying every detail of his system, more than can be outlined in this review (which also has been compiled with some help by him).

The original description of this rating system is contained in the last six pages of a publication, *Go Classifications*, mainly devoted to classifying Go openings – its date is October 1994 and thus belongs to the more recent systems examined. This work is present in the AGA library and recorded in its bibliography by Craig Hutchinson; moreover, a couple of ads were printed in the *American Go Journal* of 1994 and 1995, offering this publication for sale. Nevertheless, Go players hardly became acquainted with this system, which today may be one of the best candidates for being awarded as the least known, not to mention the least used.

Basically, the standard system of Japanese origin is used for ranking, even though here ranks are quoted as levels and steps, noting that they may be remarkably different from the usual dan-kyu ranks known to

readers, since the levels are based on 1.26 intervals, described below, and also because traditional dan-kyu ranks correspond to more or less different strengths in the various countries. A scale for pros is placed above all the amateur ranks.

In particular, Goldis considers 1p – with a 3000 value assigned – as the standard reference for any rank. This is to prevent 9p players of exceptional talent from deflating amateur ratings, as the 1p is considered a more stable reference. Above, the scale continues, with intervals decreasing from 50 to 25, until 9p at 3300. Below 1p, we find 10 amateur levels from 10 to 1 (intended roughly to correspond to dans), then 19 steps also separated by 100 points, followed by further 8 steps, corresponding on the whole to about 1-27 kyus, see two first columns of Table 1.

If we let these levels coincide with traditional dan-kyu grades, we would obtain a scale as: 100=19k, 1000=10k, 2000=1d, 2500=6d. We are already accustomed to see authors of ranking systems suggest a rating with fixed intervals between stone ranks – typically 100. Here too the 100 value between ranks is found, and this scale would hardly merit a new discussion, after those of the previous issues.

However, here the 100-point value actually corresponds to the interval of the three digits after the comma of decimal logarithms! Indeed, the mentioned numbers are considered by Goldis just as a more familiar way to name one's own rating, which actually would be the logarithm with the same digits; that is, for the four ranks quoted above, 0.100, corresponding to number 1.26, 1.000, corresponding to 10, 2.000 to 100, 2.500 to 315. The true playing strength of players thus rated would precisely be represented (see third column of Table 1) by these 1.26, 10, 100 and 315 values!

Each rank can be indicated by the four digits of its log rating, with two zeros as the last ones. But for any individual rating the two last digits will commonly be different from zero, any number being possible. With respect to coarse stone-handicap ranks, the fine-tuning offered by the rating numbers receives in this system a coherent physical interpretation in terms of komi and tie breakers (the name recently given to the system by its author is SKT-LR, from Stone Komi Tie - Logarithmic Ratings, to distinguish it from other rating systems).

Within stone ranks, komi points represent a first subdivision. Komi is a relatively recent concept, still debated as to its 'correct' value. Pros

have used various values, all with the intention of removing the numerical advantage Black has from playing first, and which remains to the end of the Go game. Five and eight are the most frequent komi values used recently. One half point is added to komi in order to avoid drawn games. From the point of view of winning probability, playing strength, and similar 'theoretical' questions, whenever komi is changed – a different game is played!

Goldis selects Ing's 8-point komi for applying his system (due to the 50% win percentage for Black and White obtained with it – see *Go World* No. 70 p. 32) and concludes that by considering the half point added for avoiding ties we can insert 16 sub-ranks within each stone rank. As a whole, by considering these 16 divisions for about 30 adjacent stone ranks, approximately 500 sub-ranks can be found for suitably ranging all Go players.

A fundamental feature of this system is thus the confluence in a single raring of several contributions, which can be added in a simple way. In particular, we can verify that the log ratings and the sub-ranks mentioned are directly and simply connected between themselves and with other properties, such as the game score.

If two players have a log rating assigned, it is immediately possible to calculate not only the suitable number of handicap stones but also the finer detail – how many komi points and which of the two players has to be given the advantage of winning ties – required in order to give them a game with exactly 50% winning probability. Let us examine a single example, verbatim taken from the 1994 publication: player A, 2673 log rating, player B, 2235 log rating. What is the complete handicap?

1. 2.673 - 2.235 = 0.438 / log rating difference provides exponent,
2. 10 to 0.438 = 2.742/2 = handicap stones,
3. 0.742 * 8 pt. = 5.936 / 5 = points to be subtracted from komi; so komi for B is 3,
4. 0.936 > 0.5 = black wins tie. Namely, Black gives 2 stones, subtracts 3 points from black score at end, and wins any tie.

Checking further examples may be needed for a complete understanding – available from the publication mentioned and directly from Bjom_T_Goldis@Hotmail.com or see his web page, Tenuki Go, at Go Ring: p.webring.com/hub?ring=weiqi ,

We have seen that this system offers an interesting new way for finding a perfectly handicapped game between any two players with established log ratings. On the other hand, game scores can either be used for adjusting ratings or be predicted if ratings are known. For instance, the theoretical score of an even game between players A and B above can be predicted as a 13 point win for A!

Of course, in order to fix reliable log ratings, a procedure has to be implemented in the system, including averaging results of several games, damping the effects on established ratings of scattered game results, and so on.

Some detail of this scale can be modified in order to let it become more uniform and similar to scales already described, to begin with the Elo absolute one. The intermediate range can be used as such. It would however be suitable to anchor this scale at one of its boundaries. In particular, the lowest range of the original scale can simply be eliminated, thus fixing its bottom limit – namely, its zero value – at 20kyu, as used in other current systems, rather than at the complete beginner.

As for the strongest levels, we may continue for pros the same scale used for amateurs, keeping between adjacent ranks the same interval of one handicap stone and 100 points – thus, there would be only 3 levels for the current professional range, at 1P, 3P and 9P in current dan terms. (The original decreasing values of the pro ratings were due to the use of 1 point komi intervals, or 0.125 antilog intervals instead of the 0.100 log intervals for amateur levels; this was done to illustrate that present 9 levels of pro dan can be represented in log rating terms.)

We will thus be able to use a single and uniform scale up to the strongest existing players and even farther if required. To fix however its upper limit at the final cut-off, expected at the strength of perfect play, would need the input of data yet by and large unknown – in particular, how many ranks separate the best professionals from perfect play.

Other suitable corrections can be inserted. The link-up from amateur to pros ranks can be adjusted. If useful, the scale basis can be changed. Even the simple log relation here suggested between playing strength (connected to winning probabilities) and stone handicaps can be substituted by another function. I am certain however that the linear approximation usually assumed is only tolerable for small differences of strength.

Table 1 Ratings in Goldis' system (from the original paper, unchanged).
Columns show, 1 – Rank, 2 – Log Rating, 3 – Antilog Points, or playing strength.

9p	3.300	1,999	4aml	2.300	200	12step	0.800	6
8p	3.275	1,875	3aml	2.200	160	13step	0.700	5
7p	3.245	1,750	2aml	2.100	125	14step	0.600	4
6p	3.210	1,625	1aml	2.000	100	15step	0.500	3
5p	3.175	1,500				16step	0.400	2.5
4p	3.140	1,375	1step	1.900	80	17step	0.300	2
3p	3.100	1,250	2step	1.800	65	18step	0.200	1.6
2p	3.050	1,125	3step	1.700	50	19step	0.100	1.26
1p	3.000	1,000	4step	1.600	40	20step	0.090	1.23
			5step	1.500	30	21step	0.080	1.2
10aml	2.900	795	6step	1.400	25	22step	0.070	1.17
9aml	2.800	630	7step	1.300	20	23step	0.060	1.15
8aml	2.700	500	8step	1.200	15	24step	0.050	1.12
7aml	2.600	400	9step	1.100	13	25step	0.040	1.1
6aml	2.500	315	10step	1.000	10	26step	0.030	1.07
5aml	2.400	250	11step	0.900	8	27step	0.020	1.05

Essential is the fact that the scale thus obtained can already be considered an absolute ratio scale, of the kind previously described for Elo scales when discussing Schmidt's system. The basis of this scale, that is, the ratio between stone ranks or the amount by which strength increases for one more handicap stone, is the tenth root of ten, about 1.26. Even if no identity could be expected, owing to the different methods of ranking, it may be worth noting the difference with the square root of ten, suggested by Elo as the basis of his absolute scale for Chess-like games.

Ultimately, only an experimental check can confirm the validity of the SKT-LR system. This is however the only system to my knowledge that actually has applied a logarithmic scale to the ranks of Go players. Let me thus conclude that this system apparently represents, with respect to current ratings, a much more promising starting point for future application.

I hope this series of articles will be useful for Go players interested in the theoretical aspects of their game. Often, it is the reviewer himself who continues – after critically analysing what is currently available – by adding his own suggestions, leading to progress in the treatment of the subject. However, residual amounts of mind and time will hardly suffice to add my own system to the list; more probably, instead of my own version, some other system will appear worth being described and

discussed. In either case, interested readers have to be patient. A subsequent contribution, if any, will not appear in the next issue. Let us leave this series to be finished – later on.