

## Rybka Investigation and Summary of Findings for the ICGA

Mark Lefler, Robert Hyatt, Harvey Williamson and ICGA panel members

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### 1. Background

1.1 Purpose: To investigate claims that the chess playing program Rybka is a derivative of the chess programs Fruit and Crafty and violated International Computer Games Association (ICGA) Tournament rules. Rybka is a program by Vasik Rajlich. Fruit was written by Fabien Letouzey. Crafty was written by Robert Hyatt.

1.2 Allegations. Allegations have surfaced that [Rybka 1.0 beta](#) and later versions are derivatives of Fruit 2.1. [Fruit 2.1](#) source code was distributed with a specific license in the [copying.txt](#) file. Part of this license reads:

"For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights."

Allegations point out that by distributing Rybka, if it is based on Fruit, this GNU license was violated (<http://icga.wikispaces.com/Open+letter+to+the+ICGA+about+the+Rybka-Fruit+issue>). If versions of Rybka are derived from Fruit and participated in ICGA tournaments, then Rybka has also violated [ICGA Tournament Rules](#). Specifically, the rules state:

"Each program must be the original work of the entering developers. Programming teams whose code is derived from or including game-playing code written by others must name all other authors, or the source of such code, in the details of their submission form. Programs which are discovered to be close derivatives of others (e.g., by playing nearly all moves the same), may be declared invalid by the Tournament Director after seeking expert advice. For this purpose a listing of all game-related code running on the system must be available on demand to the Tournament Director."

Note the rules require programmers to list all authors and the source of code, even "derived" code. The ICGA does not normally ask to review source code during a tournament unless some allegation about it is made.

1.3 Investigation Procedure. This investigation is peer reviewed, and led by a

Secretariat of three members (including one past World Champion) appointed by the ICGA President and Board. This report is the summary of the data gathered on the private ICGA Wiki (icga.wikispaces.com), and will be forwarded to the ICGA Board for final judgment along with access to the wiki's complete documentation. Authors of past ICGA Tournament programs (including four past World Champions) and other experts are included on the panel, which currently numbers 34 members. All members may contribute to both Wiki pages and discussions. This documents represents a summary of the Wiki investigation. Vasik Rajlich was also invited to join the Wiki and provide evidence in his defense. So far he has not presented any evidence, nor has he accepted the invitation to join the Wiki.

The panel investigated "pre-Rybka" 1.0 beta through Rybka 2.3.2a versions, with much of the investigation concentrated on Rybka 1.0 beta, since it was released about 6 months after Fruit 2.1 source code.

"Pre-Rybka": refers to pre-Rybka 1.0 beta versions. These were investigated to determine if versions of Rybka written before the release of Fruit were derivatives of other programs.

Rybka 1.0 beta was released in December 2005. Rybka 1.0.1-Beta competed (as Rybka beta) and won first place in Paderborn (December 27, 2005).

1.4 ICGA Tournament Participation. Rybka (under the name Rajlich) competed in the 2006 World Computer Chess Championship tournament organized by the ICGA (May 25 2006): [14th World Computer Chess Championship - Turin 2006 \(ICGA Tournaments\)](#) This date corresponds roughly with Rybka 2.1 which was released on 15 June 2006. Rybka also participated in the following ICGA Tournaments:

World Computer Chess Championship 2007 (<http://www.grappa.univ-lille3.fr/icga/tournament.php?id=173>) (Rybka 2.3.2a was released in June 2007)

World Computer Chess Championship 2008 (<http://www.grappa.univ-lille3.fr/icga/tournament.php?id=178>) (Rybka 3.0 was released in August 2008)

World Computer Chess Championship 2009 (<http://www.grappa.univ-lille3.fr/icga/tournament.php?id=192>)

World Computer Chess Championship 2010 (<http://www.jaist.ac.jp/ICGA-events-2010/info/program.pdf>).

## 1.5 **Panel Members**

The Secretariat members:

Robert Hyatt - (Crafty, Cray Blitz, World Computer Chess Champion in 1983 and 1986)

Mark Lefler (author of Now)  
Harvey Williamson (part of Hiarcs Team)

Panel members:

Albert Silver (software designer for Chess Assistant (1999-2002); currently editor of Chessbase News (2010-present))  
Amir Ban (author of Junior: World Champion 2002, 2004, 2006, World microcomputer Champion 1997, 2001)  
Charles Roberson (author of NoonianChess)  
Christophe Theron (author of Chess Tiger)  
Dariusz Czechowski (author of Darmenios)  
Don Dailey (author of Cilkchess, Star Socrates, Rex, Komodo)  
Eric Hallsworth (part of Hiarcs Team, Publisher of Selective Search magazine)  
Fabien Letousky (author of Fruit)  
Frederic Friedel (Chessbase.com)  
Gerd Isenberg (author of IsiChess)  
Gyula Horvath (author of Pandix, Brainstorm)  
Ingo Bauer (Shredder team)  
Jan Krabbenbos (Tournament Director of Leiden tournaments)  
Kai Himstedt (author of Gridchess and Cluster Toga)  
Ken Thompson (creator of Belle Chess Machine, World Computer Chess Champion 1980, Turing Award winner 1983, creator of B and C programming languages, Unix and Plan 9 developer). More Information about Ken can be found here [http://en.wikipedia.org/wiki/Ken\\_Thompson](http://en.wikipedia.org/wiki/Ken_Thompson)  
Marcel van Kervinck (author of Rookie)  
Maciej Szmit (assistant professor at Technical University of Lodz)  
Mark Watkins (MAGMA Computer Algebra Group, School of Mathematics and Statistics, University of Sydney)  
Mark Uniacke (Hiarcs, World Microcomputer Champion 1993)  
Mincho Georgiev (Pawny)  
Olivier Deville (Tournament Director of ChessWars)  
Omid David (author of Falcon)  
Peter Skinner (Tournament Director of CCT--the major annual online computer chess tournament)  
Ralf Schäfer (author of Spike)  
Richard Vida (author of Critter)  
Richard Pijl (author of The Baron)  
Stefan Meyer-Kahlen (author of Shredder, multiple world champions from 1996-2007)  
Thomas Mayer (author of Quark)  
Tord Romstad (author of Stockfish, Glaurung)

Tom Pronk (ProChess, Much)  
Vladan Vuckovic (Axon, Achilles)  
Wylie Garvin (game Programmer at Ubisoft Montreal)  
Yngvi Björnsson (The Turk)  
Zach Wegner (author of ZCT and Rondo, an upgraded version of Anthony Cozzie's Zappa program, which was world champion in 2005)

#### ICGA Board

President - David N.L. Levy  
Vice-President: Yngvi Björnsson  
Secretary-Treasurer: Hiroyuki Iida  
Programmers Representative: Rémi Coulom

#### WCCC Tournament Director

Jaap van den Herik

## **2. Investigation**

**2.1 Executable file analysis.** Since Rybka source code is not available, Zach Wegner and Mark Watkins have conducted extensive analysis of the Rybka 1.0 beta executable files. Opinions on the criteria for what constitutes improper cloning or copying vary. We think using Rajlich's own definition is good, which he wrote during the Strelka cloning postings:

“Generally, code theft is easy to show - just show the two sections of identical code, side-by-side. There isn't much to debate in such cases. Rybka is of course original (with some accepted exceptions like bit scans & bit counters, etc). Strelka contains Rybka code. Whether Strelka also contains Fruit code, I don't know and don't really care.”

This is just what is done in the Wegner and Watkins papers. Since only assembly code of Rybka was available during the investigation, this meant that code had to be interpreted to either create C-like code for comparison or to describe the actions of the code.

Note that neither Rajlich nor others have claimed actual Rybka 1.0 beta source code

was ever released. Strelka was a reverse-engineered version of Rybka 1.0 beta. This means that Rajlich claimed that even the rewritten and reconstructed source code in Strelka is still “Rybka code”.

Zach Wegner’s paper may be found at [http://icga.wikispaces.com/file/view/ZW\\_Rybka\\_Fruit.pdf](http://icga.wikispaces.com/file/view/ZW_Rybka_Fruit.pdf), web (html) version : <https://webpace.utexas.edu/zzw57/rtc/eval/eval.html>

Summary: Nearly the entire evaluation function is derived from Fruit. This includes the formulas for calculating piece-square tables, methods and features of evaluating piece mobility, rook king file proximity, rook and queen on the 7th rank, and king safety. Quoting Zach “From looking at the piece evaluation of both engines, we find that they are almost identical.” A partial listing of Fruit identical terms:

Identical formulas for calculating piece-square tables for:

- pawns
- knights
- bishops
- rooks
- queens.

Highly similar formulas for piece square tables for kings.

Identical procedures for calculating king safety:

- count of pieces attacking squares around the opponent king
- adding in an attack factor based on piece type then multiplying by a weight based on attack counts

Identical simple mobility counting for:

- knights
- bishops
- rooks
- queens

Identical measurements of pawn features:

- isolation
- doubling
- open
- highly similar backward, candidate and passed pawns

Rook Evaluation:

- identical methods for R on the 7th
- rooks on half and opened files
- king file proximity

Queens:

- identical Q on the 7th.

Blocked Bishop and Rook terms

Mark Watkins' paper [http://icga.wikispaces.com/file/view/RYBKA\\_FRUIT\\_Mar11.pdf](http://icga.wikispaces.com/file/view/RYBKA_FRUIT_Mar11.pdf)  
Summary: Agrees with the Wegner paper on Rybka's use of Fruit evaluation terms and methods. Quote "Rybka 1.0 Beta and Fruit 2.1 have exactly the same evaluation features". Disassembly of the root search analysis indicates nearly identical code and variables, even including the ordering of the variables. Appendix B on the evaluation of Rybka 2.3.2a shows "the evaluation function in Rybka 2.3.2a is substantially the same as in Rybka 1.0 Beta". Watkins compares evaluation function features between Rybka, Fruit and four other open source programs (Phalanx, Pepito, Crafty and Faile). In section D.2.3 he shows an overlap of 18.8 out of 24 evaluation terms for Rybka-Fruit (73% overlap), with much lower overlaps than between the other programs. Crafty 19.0-Fruit eval overlap:  $12.9/24 = 54\%$ , Phalanx-Fruit overlap: 43%, Pepito-Fruit overlap 37%, Faile-Fruit Overlap 23%. This has been expanded with more statistical rigour in a separate 50+ page paper mentioned in 2.4 below.

A similar evaluation of Rybka 2.3 shows:

"Here is my list of differences in eval between Rybka 2.3 (mid Feb 2007) and Rybka 1.0 Beta. As with some other Rybka versions, there are multiple "versions" of the eval (evaluation) function (e.g., some might ignore rooks) which might be due to some sort of optimisations (e.g. no rooks in root position).

- \*) The 1-3-5-10 material weighting is multiplied by 3717 rather than 3399.
- \*) The material imbalance adjustments are slightly perturbed. It seems that Rybka 2.2mp (Oct 31 2006) still had the same material imbalances as Rybka 1.0 Beta, but 2.2n2 (Dec 2 2006) differed (this version also is the first I can find to have 3717 rather than 3399).
- \*) lazy eval has some sort of "positional evaluation" incrementation (likely changed fairly early in the Rybka series).
- \*) The 3-centipawn tempo bonus was removed (not sure when -- Rybka 2.1o had a 10-centipawn bonus, in some eval funcs).
- \*) PawnFile PST is now [-4,-1,0,+1,+1,0,-1,-4] rather than -3 on a/h files.
- \*) Drawishness from pawn files was added (already in Rybka 1.2, maybe earlier).
- \*) The opening/endgame interpolation is now linear.

*Everything else (including numerology and computation methods) seems the same in Rybka 2.3 and Rybka 1.0 Beta.*

....

I think it is safe to say that very little work was done on the Rybka evaluation function from Dec 2005 to somewhere around late 2006 or early 2007 (when

Kaufman was hired).”

Note: Larry Kaufman is a Grandmaster long associated with helping programmers improve chess engines. There is absolutely no suspicion or belief on the part of the investigation panel or the ICGA that Kaufman has been in any way involved in any aspect of the copying behavior alleged of Vasik Rajlich. So far as the panel secretariat and the ICGA are concerned Kaufman’s reputation in this respect is squeaky clean.

In summary, the evaluation functions are nearly identical.

Rybka 2.3.2a: Mark Watkins analyzed the evaluation function of Rybka 2.3.2a (<http://icga.wikispaces.com/file/view/Ryb232eval.txt>). This was done to “bookend” the evaluation functions over the period of the initial ICGA Tournament appearance of Rybka. The evaluation function contained a few new terms (drawish scoring based on pawn placement and pawn mobility), but matched all the same features as Rybka 1.0 beta and Fruit. Mark summarized the Rybka 1.0 beta and 2.3.2a evaluations here: <http://icga.wikispaces.com/file/view/RybkaEvalCompare.pdf>.

Rybka-Crafty evidence. The wiki documents analysis by Mark Watkins, Zach Wegner and Robert Hyatt on pre-Rybka 1.6.1 may be found at <http://icga.wikispaces.com/Rybka-Crafty+evidence>.

Summary: Pre-Rybka 1.6.1 contains much identical code to Crafty, even including large blocks of code with obsolete code inside them, and code that performs tests that make no sense today (code that was left in Crafty by accident, by Robert Hyatt, also shows up in Rybka 1.6.1). It is inconceivable that a second author could duplicate this code purely by chance. At least hundreds of lines of code appear to be copied. These lines of code appear in Crafty in the functions `iterate.c`, `evaluate.c`, `next.c`, `bench.c`, `option.c` and others. Note that the first three modules are the basic “engine” including search, move ordering, and evaluation. Rybka also uses Crafty’s method of rotated bitboards for the board representation and, given the above evidence, it seems quite likely that there would be code “borrowing” in this aspect also. The rotated bitboard appears in all early versions of Rybka until being replaced in Rybka 4 with freely available code from Pradu Kannan.

2.2 Sudden Strength Increase. Early versions of Rybka had a much lower rating. For example, in the Chesswar 7 tournament: <http://www.open-aurec.com/chesswar/Chesswar007/Chesswar007CSt.htm>, Rybka had a rating estimate of only 2064 ELO (pre-Rybka version 1.6.1 was dated 19 April 2004). In a little over a year, its rating had jumped in Rybka 1.0 beta to 2919 ELO ([http://computerchess.org.uk/ccrl/4040/rating\\_list\\_all.html](http://computerchess.org.uk/ccrl/4040/rating_list_all.html)). Rajlich has offered no explanation for the enormous rating increase

over such a short period. Historically, after the first year of development, programs increase a maximum of 50-100 ELO per year.

2.3 Statements by Vasik Rajlich: Vasik Rajlich has made many statements about the originality of Rybka.

In a CCC post of Dec 16 2005, Rajlich stated:

"As far as I know, Rybka has a very original search and evaluation framework."

<http://www.stmintz.com/ccc/index.php?id=470751>.

Based on the analysis in 2.1 above, this statement is false.

In an interview, Rajlich said:

"Anyway, if I really had to give a number – my wild guess is that Rybka would be 20 rating points weaker had Fruit not appeared."

[http://www.superchessengine.com/vasik\\_rajlich.htm](http://www.superchessengine.com/vasik_rajlich.htm).

Based on the analysis in 2.1 above, this statement is false.

In an email with Zach Wegner, Rajlich wrote:

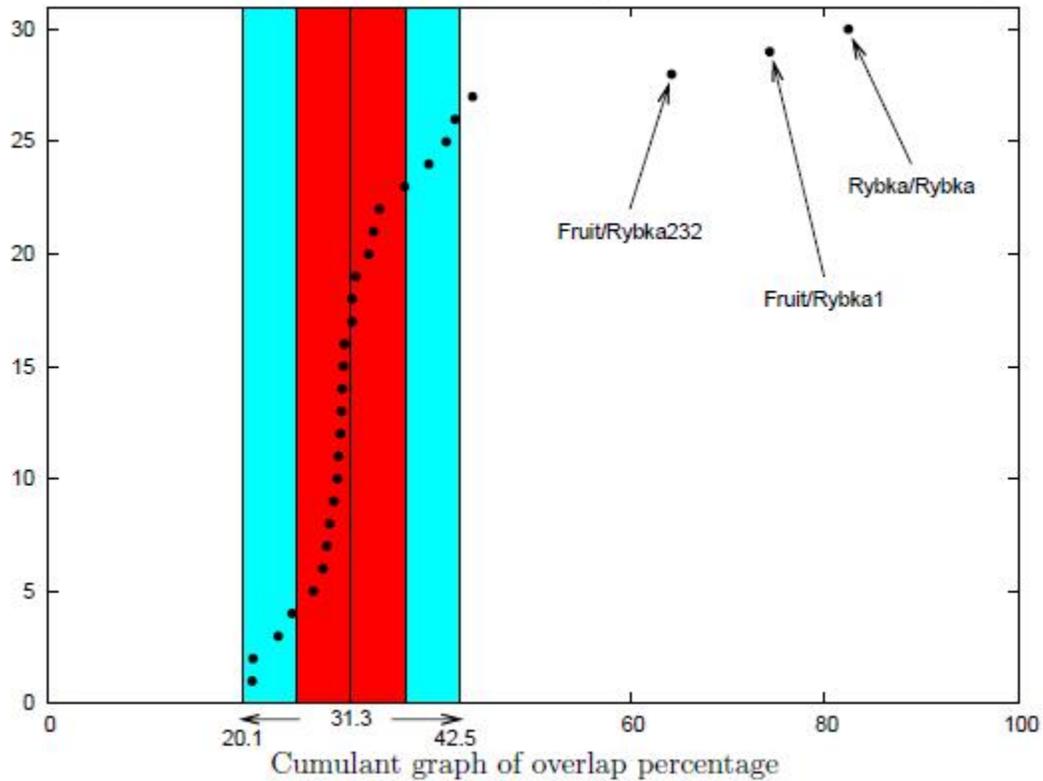
"FWIW Vasik told me this in private correspondence:

"Rybka started as a bitboard/MTD(f)/UCI engine back in March 2003. Everything I did after that, until today, has been incremental - although there were some pretty sharp turns. I can't imagine ever ditching my code base."

Based on the massive changes between pre Rybka 1.6.1 and Rybka 1.0 beta documented in 2.1 and the ICGA Wiki, this statement is false.

2.4 Comparisons with other programs

Mark Watkins analyzed seven open source programs available at the time Rybka 1.0 beta was written, plus two versions of Rybka, and compared evaluation features between them. The results are summarized here: [http://icga.wikispaces.com/file/view/EVAL\\_COMP.pdf](http://icga.wikispaces.com/file/view/EVAL_COMP.pdf). The typical evaluation feature overlaps between programs is approximately 31%, with a standard deviation of approximately 5%. The overlap between Rybka 1.0 beta and Fruit 2.1 is 74%, which is 7.5 standard deviations away, with a less than 1 in 10,000,000 chance of this happening "randomly" assuming a normal distribution. The final graph in this section 3 of this report shows how similar these versions of Rybka and Fruit are. Each dot represents a comparison between program pairs, showing the percentage of overlap of the evaluation functions.



By far, the most similar programs are various versions of Rybka with itself, and Rybka with Fruit.

### 3. Opinions of Panel Members

Here are some opinions of panel members recorded on the investigation wiki pages:

Ken Thompson:

After reading all the evidence, voted that he was convinced by the case against Rybka.

Don Dailey:

"I am convinced that there is much that is original in later versions of Rybka, but that is not the issue being discussed here.

The Rybka code base was without doubt derived directly from other peoples work and this was never revealed, so this is case of taking credit for the work of others and it shows a lack of respect for the other major talents in computer chess as well as the ICGA and organizers of these events.

His refusal to comment or cooperate is just another manifestation of this disrespect.”

Peter Skinner:

“ It is quite obvious to me that Vasik did break the rules for participation in ICGA events, as well as others like the CCT.

As the organizer/tournament director of the CCT events since CCT 7, I am quite concerned at the scope of the infractions and the duration they took place.

For the past 7 years, organizers like myself have been led to believe Rybka was an original program. This is not the case. Even in CCT6 where it played horrible, it was a clone of Crafty.

I have zero reason to believe that the plagiarism has stopped or been completely removed from Rybka 4. Since no evidence is being provided by Vasik, one can only assume he won't participate, and that he doesn't care about this inquiry or future events.

As such, based on the history of the infractions, Rybka will no longer be able to participate in CCT events. Prior event results will be taken under consideration after this panel has a ruling.”

Gerd Isenberg:

“The mentioned issues of the open letter of programmers I signed still stand. Too much Fruit in Rybka 1.0 beta. Additionally, there is the pre-fruit Rybka and Crafty issue, which throws an additional light on Vasik's mens rea using other people's code as base for his own program. Consequently, Vasik violated the ICGA Tournament Rules at the WCCCs in Turin 2006, and likely also Amsterdam 2007, Beijing 2008, and Pamplona 2009, where Rybka versions until 3.x competed with still a lot of Fruit eval inside. I'll suggest to declare Fabien Letouzey as member of the Rybka team until WCCC 2009, assuming Fabien agrees with that.”

W Garvin:

“My opinion is that Rybka 1.0 beta (Dec 5 2005) has an evaluation that is clearly derived from Fruit 2.1, and all Rybka versions through 2.3 (Feb 2007) continued to have an almost identical structure in their eval. I think the versions of Rybka that competed in the IPCCC in Paderborn in Dec 2005 and the WCCC in Turin in May 2006 were clearly derived from Fruit 2.1 and significant parts of them were

not the "original work" of the entering developers, so I think those Rybka entries violated the ICGA Tournament Rules.

I am also convinced that some versions older than Rybka 1.0 beta contain direct copies of code from Crafty, and that at least some versions of Rybka newer than 2.3 still contain significant amounts of code that is derived from Fruit 2.1. Because of this history of copying, I don't think any version of Rybka should be allowed to compete in tournaments unless the Rybka team offers some kind of affirmative evidence of originality (such as submitting the source code of the version that they wish to enter to a neutral third party to review it for originality)."

Mark Uniacke:

"It is clear to me that significant parts of Rybka's code were derived and copied firstly from Crafty in early Rybka versions and later from Fruit in later versions of Rybka. These actions altered the natural and fair course of computer chess tournaments and deprived authors of original programs of the success they had deserved.

I think the copying of first Crafty and later Fruit, both of which were among the strongest open source programs at the time, shows a clear pattern of behaviour and furthermore disrespect for the authors of those programs, the computer chess community and all the authors of original programs who entered tournaments along with Rybka.

Given this pattern of behaviour I believe later Rybka versions are also strongly implicated and will very probably also have derived or copied code from other programs within them. It is unlikely anyone will have the time to check every single Rybka version for fragments of code from the multitude of open source programs available today but I think the pattern of evidence strongly suggests all Rybka versions should be considered tainted.

With these allegations (and many others over the years), Vasik Rajlich has had many opportunities to explain the situation or defend himself, but instead I think he has deliberately misled and deceived the computer chess community for many years.

Even in the face of the now overwhelming evidence supporting the allegations, Vasik Rajlich has made no effort to defend himself or clarify the situation to save many people a lot of work in uncovering the truth. It is only through the selfless hard work of many in the computer chess community and in particular people on

this panel that the truth has finally become known.

I hope the ICGA will take firm and clear action over these violations in order to restore integrity to ICGA tournaments and help make it clear that such behaviour is unacceptable.”

#### 4. Conclusions

- Rybka 1.0 through 2.3 contain nearly identical evaluation functions to Fruit 2.1. The evaluation overlap between Rybka 1.0 beta and Fruit 2.1 is 74.4%. Between Rybka 2.3.2a and Fruit 2.1 the overlap is 64.3%. These are much, much higher than any other programs examined (which average about 30%). The same features are measured and evaluated and clearly indicate these versions of Rybka are derivatives. Comparisons were made between each of 7 open source programs available at the time of Rybka 1.0 beta’s release and two versions of Rybka, showing tremendous overlap of evaluation features indicating a near complete copy of the evaluation from Fruit 2.1. Rybka’s participation (under the name Rajlich) in the ICGA 14th and 15th World Computer Championships violated ICGA rules which require a full list of authors and revealing if any “code is derived from or including game-playing code written by others”. All panel members who expressed an opinion agree that Vasik Rajlich violated the ICGA Tournament Rules. **Not a single panel member believed him innocent.**
- Early pre-Rybka 1.0 beta versions used a great deal of Crafty code and functions, which indicates a continuing use of other program code by Vasik Rajlich. Although early versions of Rybka did not compete in ICGA Tournaments, this pattern of code plagiarism should be kept in mind when judging the case. The authors of Crafty and Fruit were never asked by Vasik Rajlich for permission to use their code.
- Vasik Rajlich’s claims of complete originality are not borne out by the facts. Rybka’s rapid strength growth (over 800 ELO in about one year) is largely due to copying evaluation terms and programming methods from Fruit 2.1. Rajlich’s claim that “Rybka has a very original search and evaluation framework” is false. The “framework” of Rybka 1.0 beta through Rybka 2.3.2a is Fruit. Rajlich’s “wild guess” that Fruit only made Rybka 20 rating points stronger is, to put it mildly, highly doubtful. The sudden and dramatic increase in Rybka’s playing strength appears to be due to copying from Fruit in violation of the Fruit license.

#### 5. Recommendations

None of the ICGA Tournament entry forms submitted by Vasik Rajlich indicated that much of Rybka's code was based on Fruit 2.1 (and earlier versions on Crafty). This is in violation of the ICGA Tournament Rules. Suitable punishment is:

- to strip Rajlich of all ICGA Tournament Titles and,
- force the return of trophies and prize funds to the ICGA and,
- ban his programs from future competitions until he can satisfy the ICGA that they are no longer derivatives and that he has satisfied the conditions of any other penalties the ICGA imposes.
- encourage other tournaments (Leiden, Paderborn, CCT, TACCL, etc.) to disallow the entry of Rybka until it is proven "clean".

## 6. **Summaries**

Two summaries are presented. A technical summary for experienced programmers and a general summary for a more general audience.

### 6.1 Technical Summary

The ICGA formed a 34 member panel of authors of past ICGA Tournament programs (including four past World Champions) and other experts. Panel members examined executable code from versions of Rybka from pre-Rybka 1.0 through Rybka 2.3.2a. The Rybka evaluation functions and some search code were reverse engineered to allow comparison with Fruit 2.1, Crafty and other chess program code.

Rybka versions from 1.0 through 2.3.2a were found to have nearly identical evaluation functions to Fruit 2.1. For the majority of the evaluation features, the same things were measured. Rybka's evaluation function was found to be 7.5 standard deviations from other programs, but nearly identical to Fruit 2.1. Analysis of the executable showed specific program lines which were likely copied from Fruit. In earlier versions of Rybka, hundred of lines of computer code appear to be copied, indicating a continuing history of code plagiarism. Use of other people's work was not documented on the ICGA Tournament entry form, as required by ICGA rules. All panel members who expressed

an opinion agree that Vasik Rajlich's Rybka violated the ICGA Tournament Rules. Not a single panel member believed him innocent. Vasik Rajlich's claims of complete originality are contrary to the facts.

## 6.2 General Summary

The ICGA formed a 34 member panel of authors of past ICGA Tournament programs (including four past World Champions) and other experts. Panel members examined various versions of the Rybka program, starting with pre-Rybka 1.0 and continuing through Rybka 2.3.2a. The Rybka evaluation functions (a crucial part of a chess program that evaluates how good or how bad a position is for each player) were reverse engineered to allow comparison with Fruit 2.1, Crafty and other chess programs. Additionally, some of Rybka's search code (a crucial part of a chess program that carries out the look-ahead analysis) was also reverse engineered to allow comparison with Fruit 2.1, Crafty and other chess programs.

Rybka versions from 1.0 through 2.3.2a were found to have nearly identical evaluation functions to Fruit 2.1. For the majority of the evaluation features, the same things were measured. The likelihood of this happening by chance is approximately 1 in 10,000,000. Analysis of various versions of the Rybka program showed specific program lines which appear to have been copied from Fruit. In earlier versions of Rybka, hundred of lines of computer software code appear to be copied, indicating a continuing history of code plagiarism. Use of other people's work was not documented in Rajlich's the ICGA Tournament entry forms, as required by ICGA rules. All panel members who expressed an opinion agree that Vasik Rajlich's Rybka violated the ICGA Tournament Rules. Not a single panel member believed him innocent. Vasik Rajlich's claims of complete originality are contrary to the facts.