

Referee's Report

Definite Integration
Daniel Lichtblau

July 22, 2010

A good paper, with a definite view “from the trenches” of doing definite integration in practice. As such, very suitable for CCA.

1 Significant Comments

- p. 2, bottom** “Note that one path, from $-1+i$ to $-1-i$, must be split where it crosses the (negative) real axis.” The author is confusing two issues here. The fact that a path needs to be split is a consequence of the fact that we are integrating round a singularity, and hence *no* single-valued indefinite integral F can represent this without such a split (for the integral would be $F(1+i) - F(1+i) = 0$). The fact that it's the path stated follows from the *particular* choice of indefinite integral, admittedly in this case the canonical one. A different instantiation of log would lead to a different split.
- p. 10** I do not understand the argument being made here. Mathematica is returning $\frac{2}{2+3n+n^2}$, which indeed *is* between 0 and 1 for positive n . So, although it's missing the condition $n > -1$, I do not otherwise see what's wrong with it, nor do I see where the value of 4.67829 for $n = 3.2$ comes from — the author hasn't explained this. I do *wonder* whether he didn't mean to quote a version of the system that didn't give $\frac{2}{2+3n+n^2}$.

2 Editorial Comments

- p. 2; *passim*** The paper requires a significant degree of Mathematica-awareness to understand the examples, e.g. the syntax here doesn't make it clear to the casual reader that we are talking about a path integral which *happens* to be closed.
- p. 3** The use of **Chop** here means nothing to the casual reader.
- p. 7** The bottom box appears to be repeated. The same problem occurs on page 14.

- p. 8 bottom** “use of convolution approach” needs an article: whether the author means *the* convolution approach or *a* convolution approach is not so clear. There doesn’t seem to be any evidence presented for the claim of “faster”.
- p. 11** The use of “path” to denote both “path of integration” and “path in the code” is confusing. One could use “contour” for the first and/or “route” for the second.
- p. 11, bottom** “because that” → “because”.
- p. 13** Is there a reason for the ‘cute’ names `alf` etc.? If not, they distract: is there is, it should be explained.
- p. 19, last bullet** There’s an unmatched ‘)’.

Bibliography The author does not refer to [RJ09], and though it appeared since the paper was submitted, the author might well wish to refer to [JR10].

References

- [JR10] D.J. Jeffrey and A.D. Rich. Reducing Expression Size Using Rule-Based Integration. In S. Autexier *et al.*, editor, *Proceedings CICM 2010*, pages 234–246, 2010.
- [RJ09] A.D. Rich and D.J. Jeffrey. A Knowledge Repository for Indefinite Integration Based On Transformation Rules. In J. Carette *et al.*, editor, *Proceedings Intelligent Computer Mathematics*, pages 480–485, 2009.