On Bounded Functional Interpretations

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A unified view over well-known interpretations of intuitionistic logic, such as Gödel's dialectica interpretation [6], Diller-Nahm interpretation [1] and Kreisel's modified realizability [7] was achieved through a parametrised interpretation in the intuitionistic logic context [8] but also, very elegantly, in the linear logic setting (see [10], [9] and [3]).

In this talk we report on work in progress concerning a general framework to the unification of the *bounded interpretations* of intuitionistic logic. This unification should include the known bounded functional interpretations whose bounds occur at the level of the interpretation of formulas, namely: bounded functional interpretation [5], bounded modified realizability [4] and confined modified realizability [2].

Similarly to the study of the interpretations that focuses in precise witnesses, in the bounded environment we also outline two different approaches towards the unification. One in the context of intuitionistic logic and the other via intuitionistic linear logic.

This is joint work with Paulo Oliva.

References

1. J. Diller and W. Nahm. Eine Variant zur Dialectica interpretation der Heyting Arithmetik endlicher Typen. *Arch. Math. Logik Grundlagenforsch*, 16:49–66, 1974.
2. G. Ferreira and P. Oliva, Confined modified realizability. To appear in *Mathematical Logic Quarterly*.
3. G. Ferreira and P. Oliva. Functional interpretations of intuitionistic linear logic. In *Proceedings of CSL 2009, LNCS 5771*, pp. 3–19. Springer, 2009.
4. F. Ferreira and A. Nunes. Bounded modified realizability. *The Journal of Symbolic Logic*, 71:329–346, 2006.
5. F. Ferreira and P. Oliva. Bounded functional interpretation. *Annals of Pure and Applied Logic*, 135:73–112, 2005.
6. K. Gödel. Über eine bisher noch nicht benützte Erweiterung des finiten Standpunktes. *Dialectica*, 12:280–287, 1958.
7. G. Kreisel. Interpretation of analysis by means of constructive functionals of finite types. In A. Heyting, editor, *Constructivity in Mathematics*, pages 101–128. North Holland, Amsterdam, 1959.
8. P. Oliva. Unifying Functional Interpretations. *Notre Dame Journal of Formal Logic*, 47(2):263–290, 2006.
9. P. Oliva. Modified realizability interpretation of classical linear logic. In *Proc. of the Twenty Second Annual IEEE Symposium on Logic in Computer Science LICS'07*. IEEE Press, 2007.
10. P. Oliva. Computational interpretations of classical linear logic. In *Proceedings of WoLLIC'07, LNCS 4576*, pp. 285–296. Springer, 2007.