Factorisation of the classical nonstandard bounded functional interpretation

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Talk Abstract

Functional interpretations are maps of formulas from the language of one theory into the language of another theory, in such a way that provability is preserved. Functional interpretations have many uses, such as: relative consistency results, conservation results and the extraction of computational content from proofs. We prove the factorisation $\mathrm{U} = \mathrm{K}\,\mathrm{B}$ of Jaime Gaspar and Fernando Ferreira's classical nonstandard bounded functional interpretation U [2] in terms of Jean-Louis Krivine's negative translation K [5] and Bruno Dinis and Jaime Gaspar's intuitionistic nonstandard bounded functional interpretation B [1]. We also give some applications of the factorisation.

Keywords: factorisation, bounded functional interpretation, negative translation, nonstandard arithmetic.

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References

[1] Bruno Dinis and Jaime Gaspar. Intuitionistic nonstandard bounded modified realisability and functional interpretation. *Annals of Pure and Applied Logic*, 169(5):392–412, May 2018.

[2] Fernando Ferreira and Jaime Gaspar. Nonstandardness and the bounded functional interpretation. *Annals of Pure and Applied Logic*, 166(6):701–712, June 2015.

[3] Fernando Ferreira and Paulo Oliva. Bounded functional interpretation. *Annals of Pure and Applied Logic*, 135(1–3):73–112, September 2005.

[4] Jaime Gaspar. Factorization of the Shoenfield-like bounded functional interpretation. *Notre Dame Journal of Formal Logic*, 50(1):53–60, January 2009.

[5] Paulo Oliva and Thomas Streicher. On Krivine's realizability interpretation of classical second-order arithmetic. *Fundam. Inf.*, 84(2):207–220, April 2008.

[6] Thomas Streicher and Ulrich Kohlenbach. Shoenfield is Gödel after Krivine. *Mathematical Logic Quarterly*, 53(2):176–179, April 2007.