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On Algorithms Related to Expressibility of Functions of Diagonalizable Algebras

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Abstract

It is well known the connection of diagonalizable algebras with propositional provability logics. The notion of expressibility of functions and related algorithmic problems is very well studied in the case of boolean functions. We propose and analyse algorithms for detecting functional expressibility of functions of a 4-valued diagonalizable algebra and examine other problems connected to iterative algebras based on diagonalizable algebras.

Keywords

Diagonalizable algebra Provability logic Expressibility of functions Problems related to expressibility of functions Iterative post algebra Function algebra Clone Completeness problem

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References

1. 1.
Bernardi C.: Modal diagonalizable algebras. Bol. Unione Mat. Ital. **15-B**(1), 15–30 (1979)[Google Scholar](#)
2. 2.
Blok, W.J.: Pretabular varieties of modal algebras. Stud. Log. **39**(2–3), 101–124 (1980)[MathSciNetCrossRefGoogle Scholar](#)
3. 3.
Burris, S., Willard, R.: Finitely many primitive positive clones. Proc. Am. Math. Soc. **101**, 427–430 (1987)[MathSciNetCrossRefGoogle Scholar](#)
4. 4.
Grätzer, G.: Universal Algebra. Springer Science & Business Media (2008)[Google Scholar](#)
5. 5.

- Kuznetsov, A.V.: On functional expressibility in superintuitionistic logics (Russian). *Matematicheskie Issledovaniya* **6**(4), 75–122 (1971)[MathSciNet](#)[Google Scholar](#) 6. 6.
- Kuznetsov A.V.: On detecting non-deducibility and non-expressibility. In: *Logical Deduction*, Nauka, Moscow, pp. 5–33 (1979)[Google Scholar](#) 7. 7.
- Magari, R.: The diagonalizable algebras. *Boll. Unione Mat. Ital.* **12**(3), 117–125 (1979)[MathSciNet](#)[zbMATH](#)[Google Scholar](#) 8. 8.
- Mal'cev, A.I.: Iterative algebras and Post's varieties (Russian). *Algebra i Logika (Sem)* **5**(2), 5–24 (1966)[MathSciNet](#)[Google Scholar](#) 9. 9.
- Maksimova, L.L.: Continuum of normal extensions of the modal logic of provability with the interpolation property. *Sib. Math. J.* **30**(6), 935–944 (1989)[CrossRef](#)[Google Scholar](#) 10. 10.
- Post, E.L.: Introduction to a general theory of elementary propositions. *Am. J. Math.* **43**, 163–185 (1921)[MathSciNet](#)[CrossRef](#)[Google Scholar](#) 11. 11.
- Post, E.L.: *Two-Valued Iterative Systems of Mathematical Logic*. Princeton (1941)[Google Scholar](#) 12. 12.
- Rață, M.F.: A formal reduction of the general problem of the expressibility of formulas in the Gödel-Loeb provability logic. *Discrete Math. Appl.* **12**(3), 279–290 (2002)[MathSciNet](#)[Google Scholar](#) 13. 13.
- Ratsa M.F.: On functional completeness in modal logic $S5S5$ (Russian). In: *Investigations on Non-classical Logics and Formal Systems*, Moscow, pp. 222–280 (1983)[Google Scholar](#) 14. 14.
- Ratsa, M.F.: Expressibility in Propositional Calculi (Russian). *Știința, Chișinău* (1991)[Google Scholar](#) 15. 15.
- Solovay, R.M.: Provability interpretations of modal logic. *Israel J. Math.* **25**, 287–304 (1975)[MathSciNet](#)[CrossRef](#)[Google Scholar](#)