Brengos, Tomasz

Rigidity of unary algebras and its application to the $\mathcal{HS} = \mathcal{SH}$ problem. (English)

Zbl 1221.08004
Algebra Univers. 65, No. 1, 73-89 (2011).

H. P. Gumm and *T. Schröder* [Algebra Univers. 53, No. 2–3, 229–252 (2005; Zbl 1086.08002)] showed that if a functor $T : \mathrm{Set} \to \mathrm{Set}$ preserves preimages, then $\mathcal{HS}(K) = \mathcal{SH}(K)$ is valid for any class K of T-algebras. The present author applies a construction of rigid unary algebras to prove that $\mathcal{HS} \neq \mathcal{SH}$ for a class of Set-endofunctors not preserving non-empty preimages. For related results cf. also papers by *T. Brengos* and *V. Trnková* [Algebra Univers. 63, No. 2–3, 283–301 (2010; Zbl 1220.03011)] and *V. Trnková* [Commentat. Math. Univ. Carol. 10, 323–352 (1969; Zbl 0183.30401); ibid. 12, 143–174 (1971; Zbl 0232.18004)].

Reviewer: Danica Jakubiková-Studenovská (Košice)

MSC:

08A60 Unary algebras
03G30 Categorical logic, topoi
08A70 Applications of universal algebra in computer science
18A22 Special properties of functors (faithful, full, etc.)
18B05 Categories of sets, characterizations

Keywords:

coalgebra; preimage preservation; functor; coalgebraic logic

Full Text: DOI

References:

[1] Adamék J., Trnková V.: Automata and Algebras in a Category. Kluwer Publishing Company, Dordrecht (1990)

[2] Brengos T., Trnková V.: The \$\$\{\{\(\backslash\)mathcal \{HS\}\} = \{\(\backslash\)mathcal \{SH\}\}\}\$\$ problem for coalgebras. Algebra Universalis 63, 283–302 (2010) · Zbl 1220.03011 · doi:10.1007/s00012-010-0079-y

[3] Gumm H.P.: Elements of the general theory of coalgebras. LUATCS 99, Rand Afrikaans University, Johannesburg (1999)

[4] Gumm H.P., Schröder T.: Types and coalgebraic structure. Algebra Universalis 53, 229–252 (2005) · Zbl 1086.08002 · doi:10.1007/s00012-005-1888-2

[5] Gumm, H. P.: From T-coalgebras to filter structures and transtion systems. In: Algebra and Coalgebra in Computer Science (CALCO 2005). Lecture Notes in Computer Science, vol. 3629, pp. 194–212. Springer (2005). · Zbl 1151.18001

[6] Jech, T.: Set Theory. The Third Millenium Edition, Revised and Expanded. Springer Monographs in Mathematics (2002).

[7] Pultr, A., Trnková, V.: Combinatorial, Algebraic and Topological Representations of Groups, Semigroups and Categories. North Holland and Academia Praque, Prague (1980). · Zbl 0418.18004

[8] Trnková V.: Some properties of Set-endofunctors. Commentationes Mathematicae Universitatis Carolinae 10, 323–259 (1969) · Zbl 0183.30401

[9] Trnková V.: On descriptive classification of Set-functors I. Commentationes Mathematicae Universitatis Carolinae 12, 143–174 (1971) · Zbl 0232.18004

[10] Vopěnka P., Pultr A., Hedrlín Z.: A rigid relation exists on any set. Commentationes Mathematicae Universitatis Carlinae 6, 149–155 (1965)

[11] Zmrzlina, A.: Too Many Functors - A continuation of "The Emergence of Functors". In: Categorical Perpectives. Trends in Mathematics, pp. 47–62. Birkhauser Verlag (2001) · Zbl 0985.18005