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Generalized power Menger algebras and generalized non-deterministic hypersubstitutions.
(English) [Zbl 1107.08005](#)

Dorfer, G. (ed.) et al., Proceedings of the 70th workshop on general algebra “70. Arbeitstagung Allgemeine Algebra”, Vienna, Austria, May 26–29, 2005. Klagenfurt: Verlag Johannes Heyn (ISBN 3-7084-0194-8/pbk). Contributions to General Algebra 17, 61-70 (2006).

A “unitary Menger algebra of rank n with infinitely many nullary operations” is a structure $(M; S^n, \langle e_j \rangle_{j \geq 1})$ in which M is the universe of the algebra, S^n is an $(n + 1)$ -ary operation on M , and the e_j 's are nullary operations such that the superassociative law

$$S^n(y, S^n(z_1, y_1, \dots, y_n), \dots, S^n(z_n, y_1, \dots, y_n)) = S^n(S^n(y, z_1, \dots, z_n), y_1, \dots, y_n)$$

and the three identities below hold in it:

$$S^n(x, e_{j_1}, \dots, e_{j_n}) = x;$$

$$S^n(e_j, x_1, \dots, x_n) = x_j \text{ for } 1 \leq j \leq n;$$

$$S^n(e_j, x_1, \dots, x_n) = e_j \text{ for } j > n.$$

In the paper under review the authors consider tree languages of a fixed type n (where all the function symbols are n -ary) with the $(n + 1)$ -ary superposition operation. In Section 1 they note that this construction gives a unitary Menger algebra of rank n with infinitely many nullary operations (where the nullary operations are interpreted by variables). In Section 2 they consider the powerset of those tree languages and introduce a generalized superposition operation for them; this also forms a unitary Menger algebra of rank n with infinitely many nullary operations. Finally in Section 3 the authors define the notion of nondeterministic generalized hypersubstitutions and show that these are exactly the endomorphisms of the latter unitary Menger algebra.

For the entire collection see [\[Zbl 1089.08001\]](#).

Reviewer: [Saeed Salehí \(Zanjan\)](#)

MSC:

- [08A40](#) Operations and polynomials in algebraic structures, primal algebras
- [08A35](#) Automorphisms and endomorphisms of algebraic structures
- [08A70](#) Applications of universal algebra in computer science
- [68Q70](#) Algebraic theory of languages and automata

Cited in **2** Documents

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[Menger algebra](#); [hypersubstitution](#); [superposition](#); [endomorphism](#); [tree languages](#)