Variety Theory of Tree Languages

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String languages can be regarded as subsets of free semigroups over their alphabets. Eilenberg's variety theorem connects families of string languages to varieties of semigroups through their syntactic semigroups.

For tree languages which are defined to be subsets of (free) term algebras several syntactic structures have been introduced in the literature, two of which are syntactic algebras and syntactic semigroups/monoids. A variety theorem for syntactic algebras of tree languages was proved by M. Steinby, but no variety theorem was known for syntactic semigroups/monoids.

In this talk, I sketch the variety theorem for tree languages and syntactic semigroups/monoids proved by the speaker recently.