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The lattice of varieties of fibered automata. (English summary)

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Fibered automata, introduced in [J. D. H. Smith, *Mult.-Valued Log.* **8** (2002), no. 4, 503–515; [MR1954603 \(2003m:08009\)](#)], are two-sorted algebras like $(S, E, \mu, \delta, \varepsilon)$ in which $\delta: S \rightarrow S$ is a unary maternal operation, $\varepsilon: S \rightarrow E$ is a unary paternal operation, and $\mu: S \times E \rightarrow S$ is a binary operation such that μ and the parent map $(\delta, \varepsilon): S \rightarrow S \times E$ are mutual inverses. These structures are capable of modeling the division algorithm and the continued fraction algorithm.

The paper under review fully characterizes the lattice of varieties of fibered automata; let us note that the class of all fibered automata is a variety (of algebras), and thus one can consider the lattice of sub-varieties of this variety. The lattice of varieties of fibered automata is isomorphic to the ordinal sum of the product $\overline{\mathbb{N}} \times \underline{2}$ with a singleton, where $\overline{\mathbb{N}}$ is the ordinal sum of a singleton with the lattice $(\mathbb{N}, |)$ of natural numbers under divisibility (Main Theorem of the paper).

Familiarity with the above-cited paper of Smith is a prerequisite for reading the paper.

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