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Using π DDs in the design of reversible circuits. (English) [Zbl 1451.68107](#)

Glück, Robert (ed.) et al., Reversible computation. 4th international workshop, RC 2012, Copenhagen, Denmark, July 2–3, 2012. Revised papers. Berlin: Springer. Lect. Notes Comput. Sci. 7581, 197–203 (2013).

Summary: With π DDs a data structure has recently been introduced that offers a compact representation for sets of permutations. Since reversible functions constitute permutations on the input assignments, they can naturally be expressed using this data structure. However, its potential has not been exploited so far. In this work-in-progress report, we present and discuss possible applications of π DDs within the design of reversible circuits including techniques for synthesis, debugging, and an efficient determination of the number of minimal circuits. We observed that π DDs inherit the same space complexities as truth tables and, hence, do not superior existing design methods in many cases. However, they are advantageous when dealing with several functions or gates at once.

For the entire collection see [\[Zbl 1322.68013\]](#).

MSC:

[68Q06](#) Networks and circuits as models of computation; circuit complexity

[68P05](#) Data structures

[68Q10](#) Modes of computation (nondeterministic, parallel, interactive, probabilistic, etc.)

Software:

[QMDD](#); [QuIDDP](#)ro

Full Text: [DOI](#)

References:

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