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Abstract
This thesis offers a method to optimize controller for asynchronous circuits with the purpose of improving performance of asynchronous controllers. This method targets on the optimization of four-phase extended burst-mode controller by removing the resetting transition of the respective input/output to the neighboring state in order to reduce the number of states within an asynchronous controller and to improve the performance at the same time; we hereby name the method as reshuffling.
Also, we categorize six types of resetting modes in the asynchronous controllers and discuss how each type is proceeding. At last, we propose a flow for the optimization process, and to implement the tool by Python language, and make it an EDA tool for the optimization of the asynchronous controller design.
Besides, we use seven test circuits to verify the difference in performance between the presimulation and the post simulation by using HDL and 3D synthesis. Our experimental data shows in improvement of 20% for the optimized controllers in those circuits.
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