GENERALIZED RECOGNITION OF GATES: a VLSI Abstraction Tool

Jean Bruce Guignet
E-mail: J.B.Guignet@frcl.bull.fr
BULL Electronic Engineering Services
BP 68 - 78340 Les Clayes Sous Bois - France

Abstract
The Generalized Recognition Of Gates is an innovative and technology independent tool of abstraction. It translates any VLSI or ASIC microelectronic circuit from its netlist format into both VHDL and VERILOG descriptions which express its behavior. The CMOS, NMOS, Bipolar and BiCMOS technologies can all be handled. One of the most important characteristics of the tool is that it is driven by an external library of rules. This reverse engineering approach is fast and well adapted to both the verification and the technology migration tasks.

Principles
The abstraction tool is flexible enough to process any full custom, standard cell or gate array style of design as it is based upon pattern matching mechanisms. These mechanisms are controlled by an external and user defined library of rules which can easily be enhanced and updated. Each rule encapsulates a parametrized model of a gate and defines precisely the VHDL and VERILOG behavior one wants to get. As soon as components are filtered by the model of a circuit, they are replaced by a surrounding entity. Complexity can be easily managed in a hierarchical manner since these entities may be referenced in higher level models. Recognition of gates with a variable number of items is allowed thanks to a kind of recursivity. Built-in functions can automatically recognize the CMOS usual gates. The tool is autonomous as there is no need to interact with it once it has been launched. A graphical interface allows to interrogate the ending result of the abstraction and to locate the recognized gates along with their behavior. This contributes to make the product more user-friendly.

Results
The principles are now well proven, since they have been in active use for several years in BULL S.A.. The tool is proved reliable and efficient, and it has been tested successfully in other companies.

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