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An Analytical Approach to Trust-Driven Placement

Hardware Trojans are deliberate malicious modifications in hardware chips. Such modifications may be introduced into a chip through third-party fabrication foundries, intellectual-property cores (IP-Cores) and un-trusted computer-aided design (CAD) tools. Currently, hardware Trojans are considered among the most crucial threats to the security of hardware chips. A new trend for confronting hardware Trojans is trust-driven hardware design (TDHD). TDHD tries to meet the trust requirements of the circuit during the main body of the design flow. This paper proposes a quadratic trust-driven placement (QTrDP) algorithm, which aims to fairly share the circuit current load on power pads. This reduces the effects of the original circuit into the current load on power pads and makes the current of potential Trojans more recognizable. The result shows a major improvement in the hardware-detection probability (by about 2 times).