Lockit: A Logic Locking Automation Software

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Abstract : The significant rise in the cost of manufacturing of nanoscale integrated circuits (IC) has led the majority of IC design companies to outsource the fabrication of their products to other companies, often located in different countries. This multinational nature of the hardware supply chain has led to a host of security threats, including IP piracy, IC overproduction, and Trojan insertion. To combat that, researchers have proposed logic locking techniques to protect the intellectual properties of the design and increase the difficulty of malicious modification of its functionality. However, the adoption of logic locking approaches is rather slow due to the lack of the integration with IC production process and the lack of efficacy of existing algorithms. This work automates the logic locking process by developing software using Python that performs the locking on a gate-level netlist and can be integrated with the existing digital synthesis tools. Analysis of the latest logic locking algorithms has demonstrated that the SFLL-HD algorithm is one of the most secure and versatile in trading-off levels of protection against different types of attacks and was thus selected for implementation. The presented tool can also be expanded to incorporate the latest locking mechanisms to keep up with the fast-paced development in this field. The paper also presents a case study to demonstrate the functionality of the tool and how it could be used to explore the design space and compare different locking solutions. The source code of this tool is available freely from (https://www.researchgate.net/publication/353195333_Source_Code_for_The_Lockit_Tool).

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