

## Seamless MATLAB® to Register-Transfer Level Design Methodology Using High-Level Synthesis

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**Abstract :** Many designers are asking for an automated path from an abstract mathematical MATLAB model to a high-quality Register-Transfer Level (RTL) hardware description. Manual transformations of MATLAB or intermediate code are needed, when the design abstraction is changed. Design conversion is problematic as it is multidimensional and it requires many different design steps to translate the mathematical representation of the desired functionality to an efficient hardware description with the same behavior and configurability. Yet, a manual model conversion is not an insurmountable task. Using currently available design tools and an appropriate design methodology, converting a MATLAB model to efficient hardware is a reasonable effort. This paper describes a simple and flexible design methodology that was developed together with several design teams.

**Keywords :** design methodology, high-level synthesis, MATLAB, verification

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