

# A Dynamic Programming Algorithm for Legalization in Standard Cell Placement

李秉光、陳木松；程仲勝

E-mail: 9901217@mail.dyu.edu.tw

## ABSTRACT

With the increasing technology of semiconductor, the number of VLSI devices is getting more larger. Hence, the design flows become more complexity for the IC front-end and back-end designs. For the row-based physical design, placement is a very importing step. In general, placement can be divided into three stages including global placement, legalization and detailed placement. The resultant solution of placement is crucial to the subsequent stages of physical design. The global placement generates an initial solution with the objectives of minimizing wirelength and congestion. The subsequent legalization stage is used to solve the legalization problem of cell placement. And then, the purpose of detailed placement is to promote the circuit performance by improving the previous solution. In this thesis, an effective algorithm, including row partition step, cell assignment step and dynamic programming based cell position adjustment step, is proposed to solve the legalization problem. The problem objective is to derive a legalization solution with total displacement as few as possible. The experimental result shows that the proposed algorithm has good performance on runtime and solution quality on average.

Keywords : placement ; physical design

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