

Design of

VLSI

Systems

A Practical Introduction

Linda E. M. Brackendury

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McMillan

Design of VLSI Systems **A Practical Introduction**

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FOR
my sons
Richard and David

Preface

The wider availability of fabrication facilities has led to an increasing number of computer scientists and engineers wishing to learn about and participate in the design of silicon chips. This book aims to provide an introduction to all the stages involved in committing a design on to silicon, ranging from system considerations and logic circuits to the design of these circuits on each layer of silicon and their fabrication.

The material is largely based on lectures given to second and third year undergraduates in the Department of Computer Science at Manchester University and aims to provide not only an understanding of the principles of the design procedure but also to maintain a practical approach. It is intended that the text should equip the first-time chip designer with the confidence and competence to attempt to produce a working integrated circuit.

Consistent with these aims, the text concentrates on safe design techniques. Also, in the interests of clarity and an improved appreciation of the principles involved, design features are usually discussed with reference to a particular example. The use of rigorous mathematics is avoided, since the accurate analysis of circuits is long and complex and often tends to obscure the essential principles.

Only an elementary knowledge of electrical fundamentals is assumed. The text should therefore be suitable for undergraduate and postgraduate students in electronic and computer engineering and allied disciplines. It is also hoped that the material will prove to be useful to those actively involved in chip design.

I have gained much experience from undertaking a chip design. In this respect, I should like to thank Professor D. B. G. Edwards in the Computer Science Department at Manchester University for his interest and encouragement. I am also grateful to the Science and Engineering Research Council for the use of their facilities. Finally, a word of appreciation to my husband, Allan, for his help in the preparation of this text.

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