1. Record Nr. UNINA9910132348703321

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Titolo	Architectures for computer vision : from algorithm to chip with Verilog / / Hong Jeong
Pubbl/distr/stampa	Singapore : , : Wiley, , 2014 ©2014
ISBN	1-118-65923-6 1-118-65919-8 1-118-65921-X
Descrizione fisica	1 online resource (469 p.)
Disciplina	621.39
Soggetti	Verilog (Computer hardware description language) Computer vision
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Architectures for Computer Vision; Contents; About the Author; Preface; Part One Verilog HDL; 1 Introduction; 1.1 Computer Architectures for Vision; 1.2 Algorithms for Computer Vision; 1.3 Computing Devices for Vision; 1.4 Design Flow for Vision Architectures; Problems; References; 2 Verilog HDL, Communication, and Control; 2.1 The Verilog System; 2.2 Hello, World!; 2.3 Modules and Ports; 2.4 UUT and TB; 2.5 Data Types and Operations; 2.6 Assignments; 2.7 Structural-Behavioral Design Elements; 2.8 Tasks and Functions; 2.9 Syntax Summary; 2.10 Simulation-Synthesis 2.11 Verilog System Tasks and Functions2.12 Converting Vision Algorithms into Verilog HDL Codes; 2.13 Design Method for Vision Architecture; 2.14 Communication by Name Reference; 2.15 Synchronous Port Communication; 2.16 Asynchronous Port Communication; 2.17 Packing and Unpacking; 2.18 Module Control; 2.19 Procedural Block Control; Problems; References; 3 Processor, Memory, and Array; 3.1 Image Processing System; 3.2 Taxonomy of Algorithms and Architectures; 3.3 Neighborhood Processor; 3.4 BPBP Processor; 3.5 DP Processor; 3.6 Forward and Backward Processors; 3.7 Frame Buffer and Image Memory

3.8 Multidimensional Array3.9 Queue; 3.10 Stack; 3.11 Linear Systolic Array; Problems; References; 4 Verilog Vision Simulator; 4.1 Vision Simulator; 4.2 Image Format Conversion; 4.3 Line-based Vision Simulator Principle; 4.4 LVSIM Top Module; 4.5 LVSIM IO System; 4.6 LVSIM RAM and Processor; 4.7 Frame-based Vision Simulator Principle; 4.8 FVSIM Top Module; 4.9 FVSIM IO System; 4.10 FVSIM RAM and Processor; 4.11 OpenCV Interface; Problems; References; Part Two Vision Principles; 5 Energy Function; 5.1 Discrete Labeling Problem; 5.2 MRF Model; 5.3 Energy Function; 5.4 Energy Function Models
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7.3 Structure from Optical Flow7.4 Factorization Method; 7.5 Constraints on the Data Term; 7.6 Continuity Equation; 7.7 The Prior Term; 7.8 Energy Minimization; 7.9 Binocular Motion; 7.10 Segmentation Prior; 7.11 Blur Diameter; 7.12 Blur Diameter and Disparity; 7.13 Surface Normal and Disparity; 7.14 Surface Normal and Blur Diameter; 7.15 Links between Vision Modules; Problems; References; Part Three Vision Architectures; 8 Relaxation for Energy Minimization; 8.1 Euler-Lagrange Equation of the Energy Function; 8.2 Discrete Diffusion and Biharminic Operators; 8.3 SOR Equation
8.4 Relaxation Equation

Sommario/riassunto

This book provides comprehensive coverage of 3D vision systems, from vision models and state-of-the-art algorithms to their hardware architectures for implementation on DSPs, FPGA and ASIC chips, and GPUs. It aims to fill the gaps between computer vision algorithms and real-time digital circuit implementations, especially with Verilog HDL design. The organization of this book is vision and hardware module directed, based on Verilog vision modules, 3D vision modules, parallel vision architectures, and Verilog designs for the stereo matching system with various parallel architectures. It provide