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Nota di contenuto	3D Laser Microfabrication; Contents; List of Contributors; 1 Introduction; 2 Laser-Matter Interaction Confined Inside the Bulk of a Transparent Solid; 2.1 Introduction; 2.2 Laser-matter Interactions: Basic Processes and Governing Equations; 2.2.1 Laser Intensity Distribution in a Focal Domain; 2.2.2 Absorbed Energy Density Rate; 2.2.3 Electron-phonon (ions) Energy Exchange, Heat Conduction and Hydrodynamics: Two-temperature Approximation; 2.2.4 Temperature in the Absorption Region; 2.2.5 Absorption Mechanisms 2.2.6 Threshold for the Change in Optical and Material Properties ("Optical Damage")2.3 Nondestructive Interaction: Laser-induced Phase Transitions; 2.3.1 Electron-Phonon Energy Exchange Rate; 2.3.2 Phase Transition Criteria and Time; 2.3.3 Formation of Diffractive Structures in Different Materials; 2.3.3.1 Modifications Induced by Light in Noncrystalline Chalcogenide Glass; 2.3.3.2 Two-photon Excitation of Fluorescence; 2.3.3.3 Photopolymerization; 2.3.3.4 Photorefractive Effect; 2.4 Laser-Solid Interaction at High Intensity; 2.4.1 Limitations Imposed by the Laser Beam Self-focusing 2.4.2 Optical Breakdown: Ionization Mechanisms and Thresholds2.4.2.1

Ionization by Electron Impact (Avalanche Ionization); 2.4.2.2
 Multiphoton Ionization; 2.4.3 Transient Electron and Energy Density in
 a Focal Domain; 2.4.2.1 Ionization and Damage Thresholds; 2.4.3.2
 Absorption Coefficient and Absorption Depth in Plasma; 2.4.3.3
 Electron Temperature and Pressure in Energy Deposition Volume to the
 End of the Laser Pulse; 2.4.4 Electron-to-ion Energy Transfer: Heat
 Conduction and Shock Wave Formation; 2.4.4.1 Electronic Heat
 Conduction; 2.4.4.2 Shock Wave Formation
 2.4.5 Shock Wave Expansion and Stopping 2.4.6 Shock and Rarefaction
 Waves: Formation of Void; 2.4.7 Properties of Shock-and-heat-affected
 Solid after Unloading; 2.5 Multiple-pulse Interaction: Energy
 Accumulation; 2.5.1 The Heat-affected Zone from the Action of Many
 Consecutive Pulses; 2.5.2 Cumulative Heating and Adiabatic Expansion;
 2.6 Conclusions; 3 Spherical Aberration and its Compensation for High
 Numerical Aperture Objectives; 3.1 Three-dimensional Intensity Point-
 spread Function in the Second Medium; 3.1.1 Refractive Indices
 Mismatch-induced Spherical Aberration
 3.1.2 Vectorial Point-spread Function through Dielectric Interfaces 3.1.3
 Scalar Point-spread Function through Dielectric Interfaces; 3.2
 Spherical Aberration Compensation by a Tube-length Change; 3.3
 Effects of Refractive Indices Mismatch-induced Spherical Aberration on
 3D Optical Data Storage; 3.3.1 Aberrated Point-spread Function Inside
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 Based on a Variable Tube Length; 3.3.3 Three-dimensional Data
 Storage in a Bleaching Polymer; 3.4 Effects of Refractive Index
 Mismatch Induced Spherical Aberration on the Laser Trapping Force
 3.4.1 Intensity Point-spread Function in Aqueous Solution

Sommario/riassunto

A thorough introduction to 3D laser microfabrication technology,
 leading readers from the fundamentals and theory to its various potent
 applications, such as the generation of tiny objects or three-
 dimensional structures within the bulk of transparent materials. The
 book also presents new theoretical material on dielectric breakdown,
 allowing a better understanding of the differences between optical
 damage on surfaces and inside the bulk, as well as a look into the
 future. Chemists, physicists, materials scientists and engineers will find
 this a valuable source of interdisciplinary know

2. Record Nr.	UNISA996392217603316
Autore	Rodrigues Joao <1558-1633.>
Titolo	The palme of Christian fortitude. Or The glorious combats of Christians in Iaponia. Taken out of letters of the Society of Iesus from thence. Anno 1624 [[electronic resource]]
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Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- Preface -- Acknowledgments -- Acronyms -- Introduction -- About the Companion Website -- Chapter 1 Embedded Technology for Mobile Robotics -- 1.1 Embedded Control System -- 1.2 Mobile Robotics -- 1.2.1 Robot Model for 2D Motion -- 1.2.1.1 Generic Model -- 1.2.1.2 Unicycle Model -- 1.2.1.3 DifferentialDrive Mobile Robot or DDMR -- 1.2.1.4 Front Wheel Steering Robot or FWSR -- 1.2.1.5 Chained form of Unicycle -- 1.2.1.6 Single Integrator Model of Unicycle -- 1.2.1.7 Discretetime Unicycle Model -- 1.2.2 Robot Model for 3D Motion -- 1.2.2.1 Quadcopter-An Aerial Vehicle -- 1.2.2.2 SixThrusters Configuration-An Underwater Vehicle -- 1.3 Embedded Technology -- 1.3.1 Processor Technology -- 1.3.2 IC Technology -- 1.4 Commercially Available Embedded Processors -- 1.4.1 Microprocessor -- 1.4.2 Microcontroller -- 1.4.3 Field Programmable Gate Arrays (FPGA) -- 1.4.4 Digital Signal Processor -- 1.5 Notes and Further Readings -- Chapter 2 Discretetime Controller Design -- 2.1 Transfer Function for Equivalent Discretetime System -- 2.2 Discretetime PID

Controller Design -- 2.3 Stability in Embedded Implementation -- 2.3.1 Sampling -- 2.3.2 Quantization -- 2.3.3 Processing Time -- 2.4 Notes and Further Readings -- Chapter 3 Embedded Control and Robotics -- 3.1 Transformations -- 3.1.1 2D Transformations -- 3.1.2 3D Transformations -- 3.2 Collision Detection and Avoidance -- 3.2.1 Vector Field Histogram (VFH) -- 3.2.2 Curvature Velocity Technique (CVM) -- 3.2.3 Dynamic Window Approach (DWA) -- 3.3 Localization -- 3.4 Path Planning -- 3.4.1 Potential Field Path Planning -- 3.4.2 Graph based Path Planning -- 3.4.2.1 Dijkstra's Algorithm -- 3.4.2.2 A* Algorithm -- 3.4.2.3 Rapidlyexploring Random Trees (RRT) Algorithm -- 3.5 Multiagent Scenarios -- 3.6 Notes and Further Readings -- Chapter 4 Bottomup Method. 4.1 Computations Using CORDIC1 -- 4.1.1 Coordinate Transformation -- 4.1.1.1 Cartesian to Polar Coordinates Conversion -- 4.1.1.2 Polar to Cartesian Coordinate Conversion -- 4.1.2 Exponential and Logarithmic Functions -- 4.2 Interval Arithmetic2 -- 4.2.1 Basics of Interval Arithmetic -- 4.2.2 Inclusion Function and Inclusion Tests -- 4.3 Collision Detection Using Interval Technique3 -- 4.4 Free Interval Computation for Collision Avoidance4 -- 4.4.1 Illustration for Detecting Collision and Computing Free interval -- 4.5 Notes for Further Reading -- Chapter 5 TopDown Method -- 5.1 Robust Controller Design -- 5.1.1 Basic Definitions -- 5.1.2 State Feedback Control -- 5.1.3 SlidingMode Control -- 5.1.4 Sliding Surface Design for Position Stabilization in 2D -- 5.1.5 Position Stabilization for a Vehicle in 3D -- 5.1.6 Embedded Implementation -- 5.2 Switched Nonlinear System -- 5.2.1 Swarm Aggregation as a Switched Nonlinear System -- 5.2.1.1 Free Subsystem s1 -- 5.2.1.2 Engaged Subsystem s2 -- 5.2.2 Embedded Implementation -- 5.3 Notes and Further Readings -- Chapter 6 Generic FPGA Architecture Design -- 6.1 FPGA Basics and Verilog -- 6.2 Systematic Approach for Designing Architecture Using FSM -- 6.2.1 PID Controller Architecture -- 6.2.2 SlidingMode Controller Architecture -- 6.3 FPGA Implementation -- 6.4 Parallel Implementation of Multiple Controllers -- 6.5 Notes and Further Readings -- Chapter 7 Summary -- Bibliography -- Index -- Books in the IEEE Press Series on Control SystemsTheory and Applications -- EULA.
