

1. Record Nr.	UNINA9910741396003321
Autore	Vermesan Ovidiu
Titolo	Industrial Artificial Intelligence Technologies and Applications
Pubbl/distr/stampa	Milton : , : River Publishers, , 2023 ©2023
ISBN	1-000-85203-2 1-00-337738-6 1-000-85205-9 1-003-37738-6
Edizione	[1st ed.]
Descrizione fisica	1 online resource (242 pages)
Altri autori (Persone)	WotawaFranz NavaMario Diaz DebaillieBjö
Disciplina	006.3
Soggetti	Intel·ligència artificial
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Half Title -- Series Page -- Title Page -- Copyright Page -- Dedication -- Acknowledgement -- Table of Contents -- Preface -- List of Figures -- List of Tables -- List of Contributors -- Chapter 1: Benchmarking Neuromorphic Computing for Inference -- 1.1: Introduction -- 1.2: State of the art in Benchmarking -- 1.2.1: Machine Learning -- 1.2.2: Hardware -- 1.3: Guidelines -- 1.3.1: Fair and Unfair Benchmarking -- 1.3.2: Combined KPIs and Approaches for Benchmarking -- 1.3.3: Outlook : Use-case Based Benchmarking -- 1.4: Conclusion -- References -- Chapter 2: Benchmarking the Epiphany Processor as a Reference Neuromorphic Architecture -- 2.1: Introduction and Background -- 2.2: Comparison with a Few Well-Known Digital Neuromorphic Platforms -- 2.3: Major Challenges in Neuromorphic Architectures -- 2.3.1: Memory Allocation -- 2.3.2: Efficient Communication -- 2.3.3: Mapping SNN onto Hardware -- 2.3.4: On-chip Learning -- 2.3.5: Idle Power Consumption -- 2.4: Measurements from Epiphany -- 2.5: Conclusion -- References -- Chapter 3: Temporal Delta Layer: Exploiting Temporal Sparsity in Deep Neural Networks for Time-Series Data -- 3.1: Introduction -- 3.2:

Related Works -- 3.3: Methodology -- 3.3.1: Delta Inference -- 3.3.2: Sparsity Induction Using Activation Quantization -- 3.3.2.1: Fixed Point Quantization -- 3.3.2.2: Learned Step-Size Quantization -- 3.3.3: Sparsity Penalty -- 3.4: Experiments and Results -- 3.4.1: Baseline -- 3.4.2: Experiments -- 3.4.3: Result Analysis -- 3.5: Conclusion -- References -- Chapter 4: An End-to-End AI-based Automated Process for Semiconductor Device Parameter Extraction -- 4.1: Introduction -- 4.2: Semantic Segmentation -- 4.2.1: Proof of Concept and Architecture Overview -- 4.2.2: Implementation Details and Result Overview -- 4.3: Parameter Extraction -- 4.4: Conclusion -- 4.5: Future Work -- References.

Chapter 5: AI Machine Vision System for Wafer Defect Detection -- 5.1: Introduction and Background -- 5.2: Machine Vision-based System Description -- 5.3: Conclusion -- References -- Chapter 6: Failure Detection in Silicon Package -- 6.1: Introduction and Background -- 6.2: Dataset Description -- 6.2.1: Data Collection & Labelling -- 6.3: Development and Deployment -- 6.4: Transfer Learning and Scalability -- 6.5: Result and Discussion -- 6.6: Conclusion and Outlooks -- References -- Chapter 7: S2ORC-SemiCause: Annotating and Analysing Causality in the Semiconductor Domain -- 7.1: Introduction -- 7.2: Dataset Creation -- 7.2.1: Corpus -- 7.2.2: Annotation Guideline -- 7.2.3: Annotation Methodology -- 7.2.4: Dataset Statistics -- 7.2.5: Causal Cue Phrases -- 7.3: Baseline Performance -- 7.3.1: Train-Test Split -- 7.3.2: Causal Argument Extraction -- 7.3.3: Error Analysis -- 7.4: Conclusions -- References -- Chapter 8: Feasibility of Wafer Exchange for European Edge AI Pilot Lines -- 8.1: Introduction -- 8.2: Technical Details and Comparison -- 8.2.1: Comparison TXRF and VPD-ICPMS Equipment for Surface Analysis -- 8.2.2: VPD-ICPMS Analyses on Bevel -- 8.3: Cross-Contamination Check-Investigation -- 8.3.1: Example for the Comparison of the Institutes -- 8.4: Conclusion -- References -- Chapter 9: A Framework for Integrating Automated Diagnosis into Simulation -- 9.1: Introduction -- 9.2: Model-based Diagnosis -- 9.3: Simulation and Diagnosis Framework -- 9.3.1: FMU Simulation Tool -- 9.3.2: ASP Diagnose Tool -- 9.4: Experiment -- 9.5: Conclusion -- References -- Chapter 10: Deploying a Convolutional Neural Network on Edge MCU and Neuromorphic Hardware Platforms -- 10.1: Introduction -- 10.2: Related Work -- 10.3: Methods -- 10.3.1: Neural Network Deployment -- 10.3.1.1: Task and Model -- 10.3.1.2: Experimental Setup -- 10.3.1.3: Deployment. 10.3.2: Measuring the Ease of Deployment -- 10.4: Results -- 10.4.1: Inference Results -- 10.4.2: Perceived Effort -- 10.5: Conclusion -- References -- Chapter 11: Efficient Edge Deployment Demonstrated on YOLOv5 and Coral Edge TPU -- 11.1: Introduction -- 11.2: Related Work -- 11.3: Experimental Setup -- 11.3.1: Google Coral Edge TPU -- 11.3.2: YOLOv5 -- 11.4: Performance Considerations -- 11.4.1: Graph Optimization -- 11.4.1.1: Incompatible Operations -- 11.4.1.2: Tensor Transformations -- 11.4.2: Performance Evaluation -- 11.4.2.1: Speed-Accuracy Comparison -- 11.4.2.2: USB Speed Comparison -- 11.4.3: Deployment Pipeline -- 11.5: Conclusion and Future Work -- References -- Chapter 12: Embedded Edge Intelligent Processing for End-To-End Predictive Maintenance in Industrial Applications -- 12.1: Introduction and Background -- 12.2: Machine and Deep Learning for Embedded Edge Predictive Maintenance -- 12.3: Approaches for Predictive Maintenance -- 12.3.1: Hardware and Software Platforms -- 12.3.2: Motor Classification Use Case -- 12.4: Experimental Setup -- 12.4.1: Signal Data Acquisition and Pre-processing -- 12.4.2: Feature Extraction, ML/DL Model Selection and Training -- 12.4.3: Optimisation

and Tuning Performance -- 12.4.4: Testing -- 12.4.5: Deployment -- 12.4.6: Inference -- 12.5: Discussion and Future Work -- References -- Chapter 13: AI-Driven Strategies to Implement a Grapevine Downy Mildew Warning System -- 13.1: Introduction -- 13.2: Research Material and Methodology -- 13.2.1: Datasets -- 13.2.2: Labelling Methodology -- 13.3: Machine Learning Models -- 13.4: Results -- 13.4.1: Primary Mildew Infection Alerts -- 13.4.2: Secondary Mildew Infection Alerts -- 13.5: Discussion -- 13.6: Conclusion -- References -- Chapter 14: On the Verification of Diagnosis Models -- 14.1: Introduction -- 14.2: The Model Testing Challenge -- 14.3: Use Case. 14.4: Open Issues and Challenges -- 14.5: Conclusion -- References -- Index -- About the Editors.

Sommario/riassunto

This book overviews the latest research results and activities in industrial artificial intelligence technologies and applications based on the innovative research, developments and ideas generated by the ECSEL JU AI4DI, ANDANTE and TEMPO projects.
